



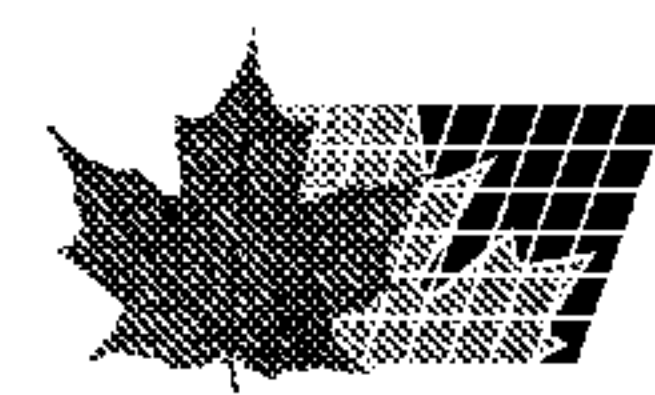
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(54) Titre : PROCÉDE POUR DETERMINER EN TEMPS REEL DES TAXES D'UTILISATION DE SERVICES A VALEUR AJOUTEE DANS UN RESEAU DE TELECOMMUNICATION  
 (54) Title: METHOD FOR DETERMINING CHARGES IN REAL TIME FOR VALUE-ADDED SERVICES IN A TELECOMMUNICATION NETWORK

(57) **Abrégé/Abstract:**

The invention relates to a method for determining charges in real time for value-added services in a telecommunication network having an intelligent network structure. According to said method, a caller selects a value-added service by dialling an associated destination directory number. Said destination directory number is detected in an intelligent network element of the telecommunication network and is converted into a special access call number for the value-added service. A connection is then created between the intelligent network element and the value-added service provider, using said access call number, the value-added service provider transmitting the valid tariff for using the requested value-added service to the mobile radio network operator in the form of a new destination directory number for the requested value-added service. The new destination directory number is evaluated in the intelligent network element, and a connection is created between the caller and the value-added service by means of the new destination directory number, applying the stated tariff.



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(54) Title: METHOD FOR DETERMINING CHARGES IN REAL TIME FOR VALUE-ADDED SERVICES IN A TELECOMMUNICATION NETWORK

(54) Bezeichnung: VERFAHREN ZUR ECHTZEITERFASSUNG VON GEBÜHREN FÜR MEHRWERTDIENSTE IN EINEM TELEKOMMUNIKATIONSNETZ

(57) Abstract: The invention relates to a method for determining charges in real time for value-added services in a telecommunication network having an intelligent network structure. According to said method, a caller selects a value-added service by dialling an associated destination directory number. Said destination directory number is detected in an intelligent network element of the telecommunication network and is converted into a special access call number for the value-added service. A connection is then created between the intelligent network element and the value-added service provider, using said access call number, the value-added service provider transmitting the valid tariff for using the requested value-added service to the mobile radio network operator in the form of a new destination directory number for the requested value-added service. The new destination directory number is evaluated in the intelligent network element, and a connection is created between the caller and the value-added service by means of the new destination directory number, applying the stated tariff.

(57) Zusammenfassung: Die Erfindung betrifft ein Verfahren zur Echtzeiterfassung von Gebühren für Mehrwertdienste in einem Telekommunikationsnetz mit IN-Netzstruktur, bei dem ein Anrufer einen Mehrwertdienst durch Wahl einer zugeordneten Zielrufnummer anwählt. In einem IN-Netzelement des Telekommunikationsnetzes wird diese Zielrufnummer erfasst und in eine spezielle Zugangsrufnummer für den Mehrwertdienst umgewandelt. Es erfolgt ein Aufbau einer Verbindung zwischen dem IN-Netzelement und dem Mehrwertdiensteanbieter unter Verwendung dieser Zugangsrufnummer, wobei der Mehrwertdiensteanbieter den gültigen Tarif für die Nutzung des angeforderten Mehrwertdienstes in Form einer neuen Zielrufnummer für den angeforderten Mehrwertdienst an den Mobilfunknetzbetreiber übermittelt. Die neue Zielrufnummer wird im IN-Netzelement ausgewertet, und eine Verbindung zwischen dem Anrufer und dem Mehrwertdienst mit der neuen Zielrufnummer unter Verwendung des angegebenen Tarifs aufgebaut.

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## Method For Determining Charges in Real Time For Value-Added Services in a Telecommunication Network

The present invention relates to a method for determining charges in real time for value-added services in a telecommunication network.

There are various methods for implementing value-added services in telecommunication networks. In telecommunication networks such as public switched telephone networks and mobile telephone networks, some value-added services are offered as services by the network operator. Common services include communication-specific services that facilitate or expand upon connections-oriented traffic. The best known examples of this type are ISDN (Integrated Services Digital Network) and GSM (Global System for Mobile Communications) features of the corresponding ETSI (European Telecommunications Standards Institute) recommendations including call diversion, call forwarding, callback on busy, call waiting, etc. These services are implemented and operated by the network operator in the telecommunication network (in public exchanges) and in the intelligent network control SCP (Service Control Point) and SMS (Service Management System). In addition, there are value-added services such as voicemail (answering machine), messaging, recorded information service, information service (weather, lottery numbers, news, or the like) that are offered by the network operator or by external value-added service providers. These can also include traffic information services. As a rule, this service category can only be accessed by network-specific customers when they dial corresponding telephone numbers; as a rule, the use of the service is linked to calling the value-added service provider and a corresponding fee is automatically charged via the telecommunication bill. Up to this point, it has not been possible to determine the charges in real time for the value-added

service being used in the telecommunication network or to change the rate during a call to a value-added service provider.

WO 01/26353 A1 has disclosed a method for changing the taxation type of communication connections during a connection, in particular when using value-added services, in which a caller can select a value-added service by dialing an associated destination number and the destination number is intercepted in a network element of an intelligent network (IN) of the telecommunication network. In the intelligent network element, this destination number is converted into a special access number for the value-added service. This special access number is then used to establish a connection between the intelligent network element and the value-added service provider using the access number and is switched through to the caller. It is not possible to inform the caller about the rate for the connection or to determine charges in real time in the telecommunication network.

An object of the invention is to disclose a method that permits a determination of charges in real time for value-added services by means of a telecommunication network.

According to an aspect of the present invention there is provided a method for determining charges in real time for value-added services in a telecommunication network, having an intelligent network structure, in which a caller selects a value-added service by dialing an associated destination number (0900  $x_1 \dots x_9$ ), having the steps:

interception of the destination number (0900  $x_1 \dots x_9$ ) in an intelligent network element of the telecommunication network and conversion of this destination number into a special access number (0121100  $x_1 \dots x_9$ ) for the value-added service;

establishment of a connection between the intelligent network element and the value-added service provider through the use of the destination number;

transmission of the applicable rate for the use of the requested value-added service from the value-added service provider to the intelligent network

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element in the form of a new destination number (01211  $y_1y_2 x_1...x_9$ ) for the requested value-added service, where the transmission of the new destination number occurs by means of a user-to-user datum (USR) in the release message;

evaluation of the new destination number in the intelligent network element;

and

establishment of a connection between the caller and the value-added service with the new destination number (01211  $y_1y_2 x_1...x_9$ ) at the stated rate.

Aspects of the present invention are provided by the following clauses.

### Clauses

1. A method for determining charges in real time for value-added services in a telecommunication network, having an intelligent network structure, in which a caller selects a value-added service by dialing an associated destination number (0900  $x_1...x_9$ ), characterized by means of the steps:

interception of the destination number (0900  $x_1...x_9$ ) in an intelligent network element of the telecommunication network and conversion of this destination number into a special access number (0121100  $x_1...x_9$ ) for the value-added service;

establishment of a connection between the intelligent network element and the value-added service provider through the use of the destination number; transmission of the applicable rate for the use of the requested value-added service from the value-added service provider to the intelligent network element in the form of a new destination number (01211  $y_1y_2 x_1...x_9$ ) for the requested value-added service;

evaluation of the new destination number in the intelligent network element; and

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establishment of a connection between the caller and the value-added service with the new destination number (01211  $y_1y_2 x_1...x_9$ ) at the stated rate.

2. The method according to clause 1, characterized in that during the use of a value-added service, the value-added service provider can change the rate at any time by terminating the current connection and transmitting a new destination number (01211  $z_1z_2 x_1...x_9$ ) in the release message; using the new destination number, a connection is established between the caller and the new telephone number at the new rate.
3. The method according to one of clauses 1 or 2, characterized in that the value-added service is identified by a particular component ( $x_1...x_9$ ) of the telephone number.
4. The method according to one of clauses 1 through 3, characterized in that the rate is encoded by means of a particular component ( $y_1y_2; z_1z_2$ ) of the destination number.
5. The method according to one of clauses 1 through 4, characterized in that the transmission of the new destination number occurs by means of a user-to-user datum (USR) in the release message.
6. The method according to one of clauses 1 through 5, characterized in that the new telephone number (01211  $y_1y_2 x_1...x_9; 01211 z_1z_2 x_1...x_9$ ) is entered into the billing record as the telephone number, which permits the accounting systems to allocate a rate.
7. The method according to one of clauses 1 through 6, characterized in that price information that corresponds to the rate determined is sent to the caller's mobile telephone terminal.

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An advantage of the invention lies in the fact that the network operator of the telecommunication network and possibly the caller himself is immediately informed of the applicable rate for the value-added service so that the network operator can charge for the service in real time. This is particularly advantageous if the call is to be accounted for via a so-called prepaid subscriber relationship; in this case, the fee for the value-added service can be debited directly from the prepaid account.

The method described above also advantageously permits a rate change during a call to a value-added service provider.

An exemplary embodiment of the invention will be explained below in conjunction with Fig. 1. Fig. 1 describes the general steps for executing the method.

In this exemplary embodiment, it is assumed that a subscriber of a mobile telephone network wishes to use his mobile telephone terminal to access a value-added service in a public switched telephone network. A value-added

service is typically accessed by calling a special telephone number such as a so-called 0900 number. In the public switched telephone network, the rate is usually only determined upon establishment of the connection (offline billing). This does not make it possible for the network operator of the mobile telephone network to determine charges in real time.

According to the invention, the call to a 0900 number, e.g. the telephone number 0900  $x_1 \dots x_9$ , where the telephone number component  $x_1 \dots x_9$  identifies the value-added service, is first intercepted in an intelligent network element of the mobile telephone network and converted into a predetermined access number, e.g. 0121100  $x_1 \dots x_9$  of the value-added service. This number is used to establish a connection between the intelligent network element and the value-added service provider, e.g. a corresponding communications server. The call to this access number occurs without the caller's knowledge and at no charge. Depending on the identification of the value-added service by the existing number component  $x_1 \dots x_9$ , the call recipient, i.e. the value-added service provider, can determine the rate to be charged for the use of the service. This rate is transmitted by means of a signal from the value-added service provider to the intelligent network element of the mobile telephone network operator, in fact, through transmission of a new destination number for the requested value-added service. According to the invention, the user-to-user datum USR in the release message can be used to transmit the new destination number. The release message is a report that can be sent section by section in both directions of an intelligent network. This command terminates the user channel connection. The USR report can be sent via an end-to-end connection using the SCCP protocol.

The destination number transmitted has, for example, the format 01211  $y_1 y_2 x_1 \dots x_9$ , where the rate is encoded at the positions  $y_1 y_2$ ; in this example, there are thus 99 possible rate levels. The release message is evaluated by the intelligent network element of the mobile telephone network operator and a connection is initiated between the original caller and this telephone number. The accounting



data, the so-called billing record, now contains the new telephone number 01211  $y_1y_2 x_1...x_9$  as the telephone number, which permits the accounting systems to allocate a rate. This telephone number can also be used to announce a price to the caller. If the value-added service provider then wishes to change the rate, it terminates the call and transmits a new destination number in the release message, e.g. 01211  $z_1z_2 x_1...x_9$ ; the above-described process repeats, i.e. the release message is evaluated by the intelligent network of the value-added service operator and a connection is initiated between the original caller and the new telephone number at the new rate, naturally. This method can be repeated any number of times.

The value-added service provider can, as needed, retain a context for the caller (CgPty) so that when entering the next price level, the caller is not treated as a new caller due to the fact that a new call is in fact physically being made.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method for determining charges in real time for value-added services in a telecommunication network, having an intelligent network structure, in which a caller selects a value-added service by dialing an associated destination number (0900  $x_1 \dots x_9$ ), having the steps:

interception of the destination number (0900  $x_1 \dots x_9$ ) in an intelligent network element of the telecommunication network and conversion of this destination number into a special access number (0121100  $x_1 \dots x_9$ ) for the value-added service;

establishment of a connection between the intelligent network element and the value-added service provider through the use of the destination number;

transmission of the applicable rate for the use of the requested value-added service from the value-added service provider to the intelligent network element in the form of a new destination number (01211  $y_1 y_2 x_1 \dots x_9$ ) for the requested value-added service, where the transmission of the new destination number occurs by means of a user-to-user datum (USR) in the release message;

evaluation of the new destination number in the intelligent network element; and  
establishment of a connection between the caller and the value-added service with the new destination number (01211  $y_1 y_2 x_1 \dots x_9$ ) at the stated rate.

2. The method according to claim 1, wherein during the use of a value-added service, the value-added service provider can change the rate at any time by terminating the current connection and transmitting an new destination number (01211  $z_1 z_2 x_1 \dots x_9$ ) in the release message; and wherein using the new destination number, a connection is established between the caller and the new telephone number that is charged at the new rate.

3. The method according to claim 1 or 2, wherein the value-added service is identified by a particular component ( $x_1 \dots x_9$ ) of the telephone number.

4. The method according to any one of claims 1 to 3, wherein the rate is encoded by means of a particular component ( $y_1y_2; z_1z_2$ ) of the destination number.
5. The method according to any one of claims 1 to 4, wherein the new telephone number ( $01211 y_1y_2 x_1 \dots x_9; 01211 z_1z_2 x_1 \dots x_9$ ) is entered into the billing record as the telephone number, which permits the accounting systems to allocate a rate.
6. The method according to any one of claims 1 to 5, wherein price information that corresponds to the rate determined is sent to the caller's mobile telephone terminal.

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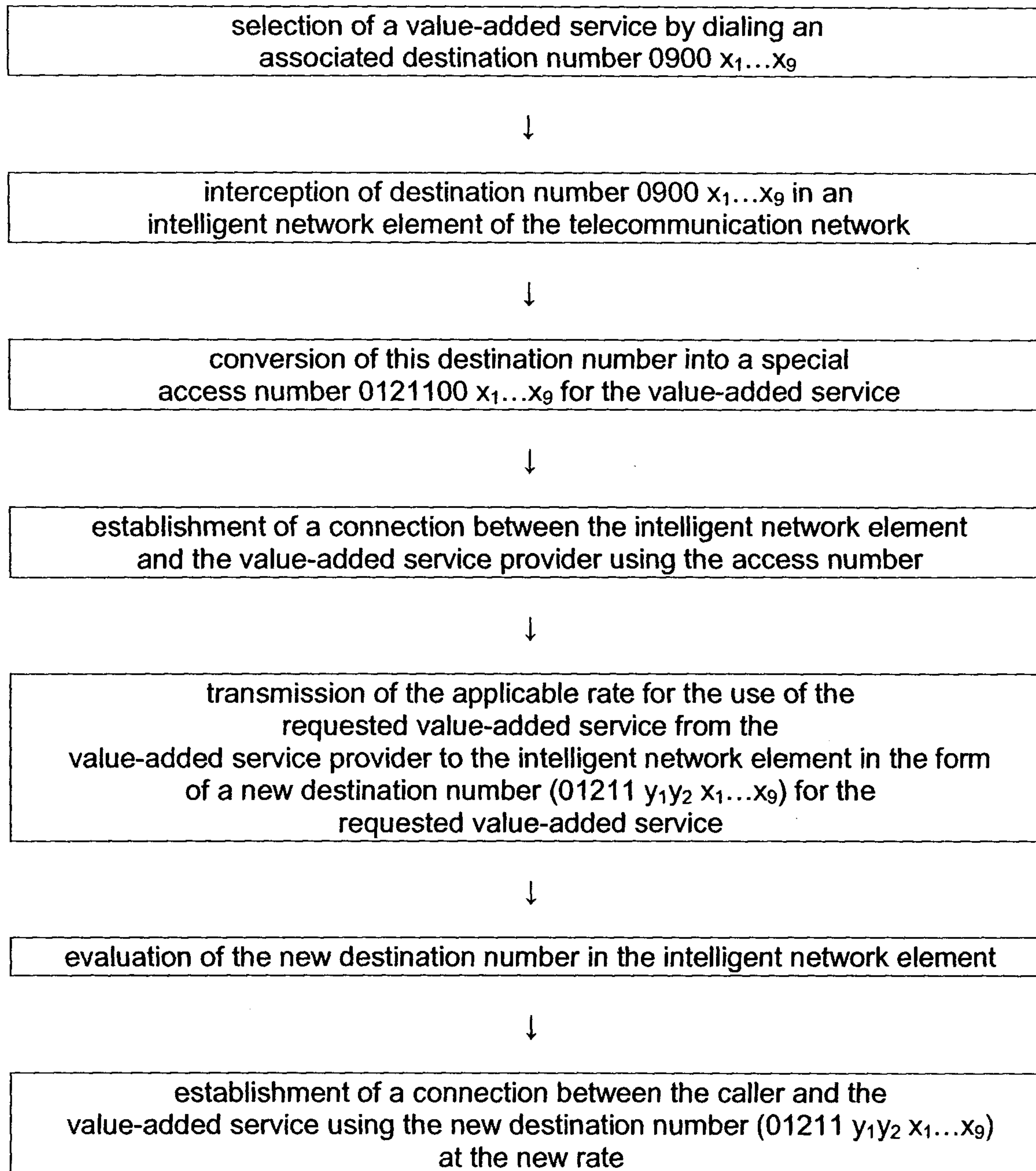


Fig. 1