# METHOD OF MANAGING DATA STORED ON A CHIP CARD THAT CAN BE READ BY MOBILE TELEPHONE

The present invention pertains to the field of information management, i.e., the acquisition of this information by a computer-based system and the restoration of this information to the user.

The present invention pertains as a nonlimitative example to the field of medical information, notably information pertaining to chronic pathologies such as allergies and diabetes. However, this invention is not restricted to this field of application but can be employed for the management of diverse types of information such as interactive games, information, applications or files to be loaded in the random access memory of the mobile telephone.

Within the framework defined above, the invention pertains to the use of a smart card of the SIM type which is readable by a standard mobile telephone. This smart card contains the information in question and is thus the vector of said acquisition and restoration.

Already known in the prior art from the American patent US 6,026,007 (Jigour Robin et al.) is an insertable and removable high-capacity digital memory device. Each device from a family of removable digital media devices can be inserted in a host so as to enable the host to store therein data or an extract from the data. The form factors of the digital media devices in the family and the connector systems used for the digital media devices are compact so as to minimize the volume of space occupied in the portable device and for easy storage. Several modes of implementation propose an elongated compact form factor which provides an ease and stability of grasping for insertion and withdrawal. The digital media devices of the family have the same cases and are preferably constituted by a rigid or semi-rigid material. The digital media devices of the

family preferably uses memory in series which requires little power and line signals such that few electric contracts are necessary. In particular, a small number of durable contact blocks form the contact matrices on the digital media devices, which in conjunction with corresponding contact blocks mounted on an adapted piece enables easy and practical insertion and withdrawal as well as a robust and reliable electrical contact during a long duration of insertion life. The digital memory devices of the family preferably contain a flash memory which enables operating at low voltage, a low consumption of electricity and a safeguarding of the nonvolatile data and at high capacity. The digital media devices of the family are preferably manufactured using surface mounting techniques, particularly the reduced cost "chip on board" technique. The digital media devices interface with the host directly or by means of adaptors. Access is processed by a dedicated controller or another logical element residing in the adaptor or on the host, or by a software program executed on the host.

This document describes high-capacity cards and does not pertain to the use of small-memory cards such as the SIM (Subscriber Identification Module) cards intended for subscriber identification by a GSM mobile telephony operator.

Also known in the prior art from PCT patent application WO 98/15910 is a global electronic medical record (GEMR: Global Electronic Medical Record). This invention pertains to systems and methods suitable for a secure, confidential global electronic medical record, managed by the subscriber and which can be updated. These systems and methods, which are used on a network, pertain to the medical information of the connected subscriber, with access to the information, thanks to the network address and a password, being limited solely to the subscriber or an authorized user. These systems and methods are particularly suitable for medical treatments concerning subscribers traveling abroad, the systems comprising an emblem giving the network address

of the global electronic medical record of the subscriber or global electronic medical record servers. The password is communicated by the subscriber to the authorized user who needs to have access to the subscriber's global electronic medical record. According to the preferred implementation, only the subscriber's medical information residing on the global electronic medical records server can be obtained, while according to a more preferential implementation, access to institutional servers or servers of other medical sites makes it possible to obtain a complement of medical information pertaining to the subscriber, said medical information to be incorporated in the subscriber's global electronic medical record. According to the most preferential implementation, the global electronic medical record, which resides on the Web, has hypertext links between the parts of the subscriber's global electronic medical record.

This document pertains to electronic medical records and does not pertain to the possibility of managing information by means of an SIM type smart card.

Also known in the prior art from the American patent US 5,832,488 filed by Stewart S. Bowie, is a computer system and a method for programming said system in order to:

– store individual medical data on a storage support, preferably of the size of a credit card;

– add new medical data regarding the individual on the storage support;

– communicate with other computers in order to retrieve the greatest amount of data regarding the individual;

– enable a second computer to collect and sort the data regarding the individual and other individuals according to certain medical criteria.

This invention of the prior art provides a solution for the storage of personal data, medical data in this instance, on a central system that can be consulted from

a computer connected to said central system. This system, however, is not effective if this information is required in an environment not equipped with a computer, e.g., in the street.

The present invention intends to resolve the drawbacks of the prior art by storing the data on a support which can be read by a large number of terminals. The data are thus stored on an SIM smart card which can be read by a mobile telephone. This solution resolves the problem of rapid accessibility to the information because the mobile telephone is a widely distributed, standardized product.

For this purpose, the present invention pertains in its most general sense to a method for information management from a telecommunication equipment unit comprising a screen and equipped with an SIM memory card connector, the method comprising a step of recording the information in the memory registers of a standard SIM card, and a step of exchanging information between said telecommunication equipment unit and said SIM card according to a standardized protocol, characterized in that the step of subscriber authentication and connection to the telecommunication network is avoided, and in that the SIM Toolkit application developed in the SIM card is executed thereby enabling management of the information.

The step of recording the information preferably comprises an operation of recording in the register corresponding to the IMSI number a numeric derivation sequence whose value is not assigned to a telecommunications operator nor to a country, said information not corresponding to the telecommunication information and being recorded in the registers usually intended for the recording of the information required for establishing a session with a telecommunication operator, the information exchange step comprising the inhibition of the establishment of a connection session due to the fact of the

detection of the derivation sequence and the loading in the random access memory of the telecommunication equipment unit of the information that can be displayed on the screen of said telecommunication equipment unit from the standardized applications of said telecommunication equipment unit.

Said derivation sequence is advantageously constituted by the value "001" for the code corresponding to the MCC and "01" for the code corresponding to the MNC (cf. figure 2).

The file $EG_{AD}$ is advantageously present in the card and at the value "800,000".

The method advantageously comprises a step of writing on a storage means and step of reading on said storage means, said writing step comprising:

- a step of filling out a record by the user with personal information;
- a step of sending said record to an operator connected to a server linked to a database;
- a step of verification of the record by said operator;
- a step of integrating the record in the database;
- a step of writing the record on a storage means;

said reading step comprising:

- a step of connection of said storage means with a telecommunication equipment unit capable of reading and displaying the information contained in said storage medium;
- a step of displaying said information on the screen of said telecommunication equipment unit;

said storage means being an SIM type smart card, said telecommunication equipment unit comprising a SIM type smart card reader and said connection step consisting of the insertion of said smart card into said reader.

According to a first variant, said information not corresponding to the telecommunication information is constituted by numeric sequences executable by the application software programs of the telecommunication equipment unit.

According to another variant, said information not corresponding to the telecommunication information is constituted by alphanumeric sequences that can be displayed by the software programs of the telecommunication equipment unit.

According to another variant, said information not corresponding to the telecommunication information is constituted by a game executable by the software programs of the telecommunication equipment unit.

According to one particular mode of implementation, said telecommunication equipment unit is a mobile telephone.

This mode of implementation is contrary to the teaching of the expert in the field which provides that the SIM card is intended for exchanges between the cellular telephone, the subscriber card and the telephony operator in the framework, e.g., of the protocol GSM03-48. The card as known by the expert in the field contains a subscriber identifier required for establishing the connection as well as cryptologic means employed in the exchanges between the operator and the telephone.

The invention consist of going against this usual teaching so as to turn away in a surprising manner from the dialogue between the cellular telephone and the card inserted in the reader so as to cause it to fulfill a new function for which it was not conceived as a local peripheral device outside of the network for the management of a medical information card.

The use of the portable telephone as a universal reader is based on the characteristic of ready access to the telephone. The originality of the method is based among other factors on the fact of diverting the telephone from its object

by bypassing the phases of authentication and connection to a mobile telephony network, and operating with the SIM-ToolKit application developed on the card for displaying and spooling menus on the telephone.

In particular, it is necessary to circumvent the SIM-lock possibly implemented on the telephone. SIM-lock is the operation that restricts the use of the telephone solely to SIM cards distributed by the operator that supplied the telephone. One way to circumvent the SIM-lock and gain control is to use the telephone's test mode. For most telephone models, the test mode is obtained by replacing in the IMSI the codes identifying the operator, MCC and MNC, respectively by "001" and "01".

These "codes identifying the operator" correspond to the first five digits of the IMSI (International Mobile Subscriber Identity) the composition of which is represented in figure 2. The IMSI is stored on the SIM card in an elementary file (EF) $EF_{IMSI}$. Upon initialization of the SIM card (when applying power to the terminal), the terminal selects the dedicated file $EF_{GSM}$ and requests the preferred language. If this EF is not available or if the languages are not supported, the terminal selects a language by default. It then executes the procedure of verification of the CHV1 (password associated with the SIM card).

If the CHV1 verification procedure is executed successfully, the terminal executes the SIM phase request procedure. In the case of a SIM phase 2, the GSM operating mode only commences if the $EF_{IMSI}$ and $EF_{LOCI}$ are validated. As described in the GSM standard 11.11, the GSM operating mode then commences and the terminal executes the following procedures:

a) request administrative information;

b) request SIM service table;

c) request IMSI;

d) request access control;

e) request HPLMN search period;

f) request PLMN selector;

g) request localization information;

h) request encryption key;

i) request BCCH information;

j) request prohibited PLMN.

When the initialization of the SIM card has been performed successfully, the terminal is ready for a GSM session. In the present invention, passage into test mode will lead to avoiding the network identification process. This allows the user to circumvent the operator's SIM-lock and take control of the terminal.

According to one particular mode of implementation, said record is filled out by handwriting and said certification step consists of applying a specific stamp to the handwritten document.

According to another mode of implementation, said step of filling out the record is electronic and said certification step consists of adding an electronic signature to the electronic document.

Said writing step advantageously comprises a supplementary step of encrypting the data contained in the chip. On the other hand, the data contained in the chip can be protected by a code.

The data contained in said database are advantageously encrypted. On the other hand, the data contained in the database can be protected by a code.

Said writing step advantageously comprises a supplementary step of loading libraries on the smart card enabling use of the telephone functions: telephone call, language management, operator management.

According to one particular mode of implementation, the smart card does not contain means enabling the telephone in which it is inserted to connect to a communication network.

Better understanding of the invention will be obtained from the description presented below, on a purely explanatory basis, of one mode of implementation of the invention with reference to the attached figures:

- figure 1 illustrates the data acquisition process on the chip;
- figure 2 represents the composition of the IMSI (International Mobile Subscriber Identity).

Before continuing, it is necessary to provide definitions for terms employed below.

The term "third party certifier" corresponds to a person endowed with a means for certifying the information furnished by the user, said means being recognized and approved by the system implementing the invention.

The term "record" corresponds to any support for inputting personal information. In paper form, a record is constituted by a form on which the user provides information in fields as a function of the headings. In electronic form, a record is an electronic file containing the fields filled out by the user via an interface. The record is optionally divided into two parts: the first part is filled out by the user and the second part is filled out by the third party certifier as a function of the knowledge that he has of the user. For example, in the case of medical data, the user provides the information regarding his civil status and the third party certifier provides the information regarding diseases, treatments, allergies and emergency referrals for the physician treating the bearer.

The term "user profile" corresponds to the translation of the record into the format of the database. This profile contains the same information as the record but in a format compatible with the database.

The acquisition method according to the invention, illustrated in the figure, comprises the following steps:

- a step of filling out the record (1) by the user (6);

• a step of completion of the record (1) by a third party certifier (7): in the particular case of medical data, this certifier is a physician who fills out the fields concerning diseases, treatments, allergies and referral to the user's treating physician;

• a step of certification of the record (1): in the case of a handwritten record, a stamp is applied to the record by the third party certifier and in the case of an electronic record the electronic signature of the third part certifier is applied to the record;

• a step of sending the record (1) to the server containing the database (2) of the user profiles via the link (4);

• a step of verification of the conformity and integrity of the record (1) by a verifier (8), said verifier being either a person or a program;

• an optional step of conversion of the record (1) into the format of the database (2): in the case of a handwritten record, a person transcribes into the format of the database the information contained in the record; in the case of an electronic record, a program is in charge of making the record information correspond to the information required for the constitution of the entry in the database;

• a step of writing the user profile on the SIM chip (3) via the link (5) with a possible conversion of the user profile into a format that can be read and displayed by a standard mobile telephone.

The restoration process comprises the following steps:

• a step of insertion of the chip into the telephone's smart card reader;

• a step of reading the information on the chip;

• a step of displaying said information on the screen of the mobile telephone;

• a step of consultation of said information displayed by a person who can be the user or a third party.

According to a particular mode of implementation of the invention, the information contained by the chip is protected by a PIN type code or encrypted such that the reading of this information is contingent on the knowledge of a key (access code or encryption key).

In the same manner, access to the database is restricted by a code or the data contained in the database are encrypted in order to guarantee the security of the data contained in said database.

Moreover, the chip can contain information enabling use of certain telephone functions other than display: a payment means so as to enable telephone communication with a preregistered number in the chip, a communication means with the telephone so as to detect the language in which the telephone is adjusted and display the information in that language.

The invention was described above as an example. It is understood that the expert in the field could implement different variants of the invention without thereby going beyond the scope of the patent.

## *CLAIMS*

1. Method for information management from a telecommunication equipment unit comprising a screen and equipped with an SIM memory card connector, the method comprising a step of recording the information in the memory registers of a standard SIM card, and a step of exchanging information between said telecommunication equipment unit and said SIM card according to a standardized protocol, characterized in that the step of subscriber authentication and connection to the telecommunication network is avoided, and in that the SIM Toolkit application developed in the SIM card is executed thereby enabling management of the information.

2. Information management method according to claim 1, characterized in that the step of recording the information comprises an operation of recording in the register corresponding to the IMSI number a numeric derivation sequence whose value is not assigned to a telecommunications operator nor to a country, said information not corresponding to the telecommunication information and being recorded in the registers usually intended for the recording of the information required for establishing a session with a telecommunication operator, the information exchange step comprising the inhibition of the establishment of a connection session due to the fact of the detection of the derivation sequence and the loading in the random access memory of the telecommunication equipment unit of the information that can be displayed on the screen of said telecommunication equipment unit from the standardized applications of said telecommunication equipment unit.

3. Information management method according to claim 2, characterized in that said derivation sequence is constituted by the values "001" for the MCC and "01" for the MNC.

4. Information management method according to claim 1, 2 or 3, characterized in that the file $EG_{AD}$ is present in the card and at the value "800,000".

5. Method for managing information from a telecommunication equipment unit according to claim 1, 2, 3 or 4, characterized in that it comprises a step of writing on a storage means and a step of reading on said storage means, said writing step comprising:

- a step of filling out a record by the user with personal information;
- a step of sending said record to an operator connected to a server linked to a database;
- a step of verification of the record by said operator;
- a step of integrating the record in the database;
- a step of writing the record on a storage means;

said reading step comprising:

- a step of connection of said storage means with a telecommunication equipment unit capable of reading and displaying the information contained in said storage medium;
- a step of displaying said information on the screen of said telecommunication equipment unit;

said storage means being an SIM type smart card, said telecommunication equipment unit comprising a SIM type smart card reader and said connection step consisting of the insertion of said smart card into said reader.

6. Method for managing information from a telecommunication equipment unit according to claim 1, 2, 3 or 4, characterized in that said information not corresponding to the telecommunication information is constituted by numeric sequences executable by the application software programs of the telecommunication equipment unit.

7. Method for managing information from a telecommunication equipment unit according to claim 1, 2, 3 or 4, characterized in that said information not corresponding to the telecommunication information is constituted by alphanumeric sequences that can be displayed by the software programs of the telecommunication equipment unit.

8. Method for managing information from a telecommunication equipment unit according to claim 1, 2, 3 or 4, characterized in that said information not corresponding to the telecommunication information is constituted by a game executable by the software programs of the telecommunication equipment.

9. Information management method according to claim 1, 2, 3 or 4, characterized in that said telecommunication equipment unit is a mobile telephone.

10. Information management method according to claim 1, 2, 3 or 4, characterized in that said writing step comprises an additional step positioned after the step of filling out the record consisting of a step of completing said record by a third party certifier for the information requiring the expertise of said third party.

11. Information management method according to any one of the preceding claims, characterized in that said step of filling out the record is handwritten and

in that said certification step consists of applying a specific stamp on the handwritten document.

12. Information management method according to any one of the preceding claims, characterized in that said step of filling out the record is electronic and that said certification step consists of adding an electronic signature to the electronic document.

13. Information management method according to any one of the preceding claims, characterized in that said writing step comprises a supplementary step of encrypting the data contained in the chip.

14. Information management method according to any one of the preceding claims, characterized in that said data contained in the chip are protected by an access code.

15. Information management method according to any one of the preceding claims, characterized in that the data contained in said database are encrypted.

16. Information management method according to any one of the preceding claims, characterized in that the data contained in the database are protected by at least one access code.

17. Information management method according to any one of the preceding claims, characterized in that said writing step comprises a supplementary step of loading libraries on the smart card enabling use of the telephone functions: placing a call, management of the languages, management of the operators.

18. Information management method according to claim 1, 2, 3 or 4, characterized in that said smart card does not contain means for enabling access to a telecommunication network by the telephone in which it is inserted.

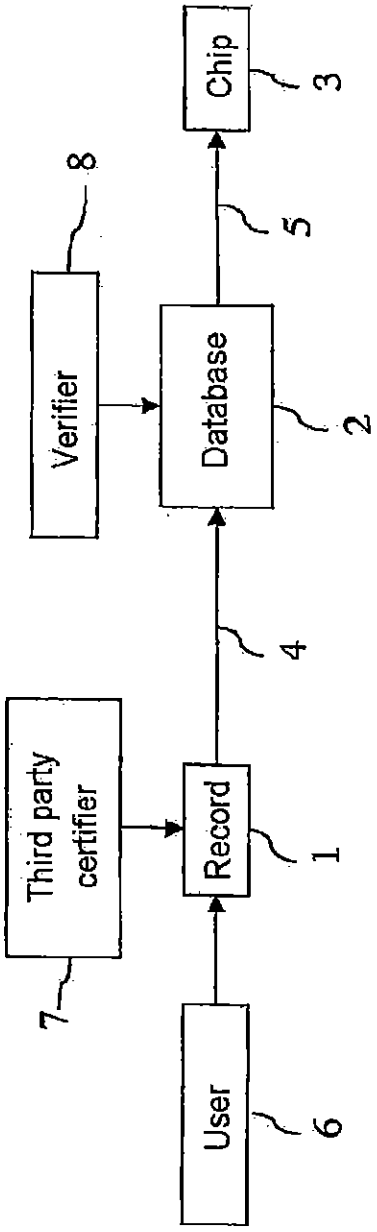

Chip
3
8
5
Verifier
Database
2
4
Third party certifier
Record
1
7
User
6

Figure 1

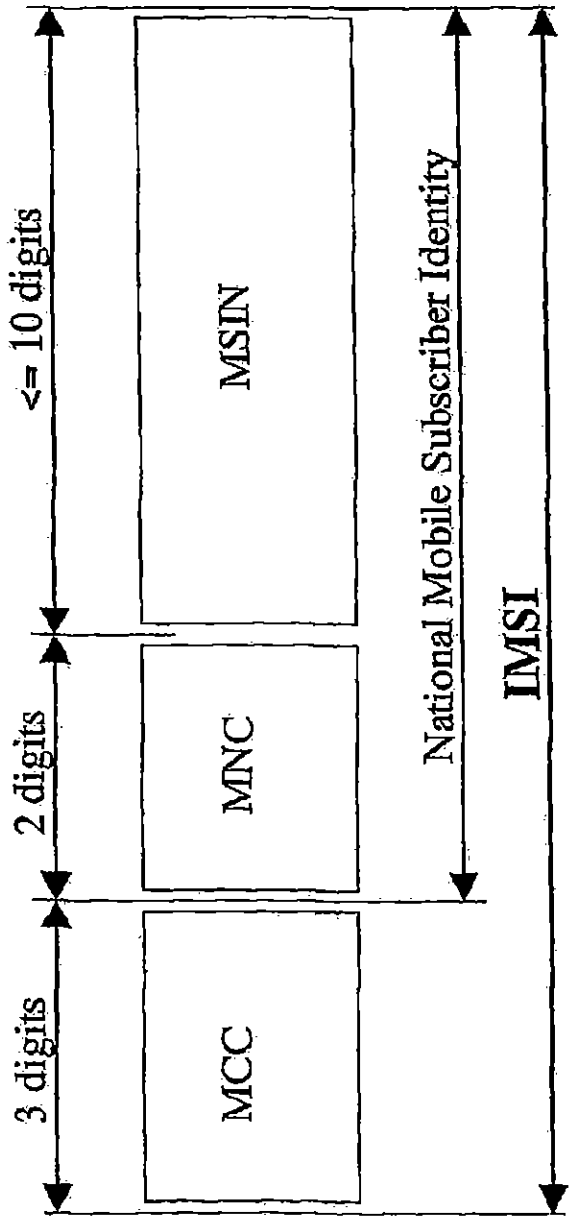



Figure 2 : Composition of the IMSI