

A METHOD OF PARAMETERIZING THE DISPLAY ON MOBILE RADIO-COMMUNICATIONS EQUIPMENT CO-OPERATING WITH A SUBSCRIBER IDENTITY MODULE

The present invention relates to a radio-communications system, in particular of the GSM type (global system for mobile communications), of the DCS type (digital cellular system), or of the PCS type (personal communication system).

More particularly, the invention relates to a method enabling best advantage to be taken of the display means associated with a piece of mobile radiocommunications equipment that co-operates with a subscriber identity module.

The GSM recommendations of the ETSI (European Telecommunication Standards Institute) recommend using a subscriber identity module (SIM) for storing both data specific to the user and data relating to the additional services which are supplied to the radiocommunications terminal.

ETSI recommendation GSM 11.11 and entitled *Digital cellular telecommunications system (phase 2+); specification of the subscriber identity module - mobile equipment (SIM-ME) interface* defines the interface between the subscriber identity module (SIM) and the radiocommunications mobile equipment (ME).

ETSI recommendation GSM 11.14 entitled *Digital cellular telecommunications system (phase 2+); specification of the SIM application tool kit for the subscriber identity module - mobile equipment (SIM-ME) interface* defines the way in which applications (or services) stored in the subscriber identity module (SIM) are to communicate with the radiocommunications mobile equipment (ME).

In particular, that recommendation describes a set of functions known as proactive functions that the SIM can send to the ME.

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The additional services which are stored in the SIM can be of various kinds and of various levels. As examples, mention can be made of the following:

- a service for storing data of the telephone directory type; and
- a service for sending and receiving short alphanumeric messages (SMS for short message service).

The advantage of operating in that way is to make services independent of equipment type. It is then possible to make use of the services offered by a SIM from any piece of radiocommunications mobile equipment, i.e. independently of its manufacturer.

Thus, for example, the SIM can send a function which consists in displaying a menu on the screen of the terminal, from which menu the user can select an option.

The way in which the various options on offer are displayed on the screen is not specified by the function as sent by the SIM. It is the ME which takes charge of display management.

Nevertheless, the display capabilities of recent generations of mobile terminals are becoming most advantageous, and in particular they provide displays of high resolution (e.g. 15 lines of 15 columns).

The state of the art is becoming inadequate for enabling an application to manage that amount of display space.

In particular, an application which is given that amount of display space to use may desire to manage it itself rather than allow the ME to make its own decisions.

The object of the present invention is thus to enable the SIM to parameterize the display so as to give applications greater freedom to make use of the display means associated with an ME.

The invention provides a method of parameterizing the display on display means associated with a piece of radiocommunications mobile equipment co-operating with a

subscriber identity module, the method having the following steps in order:

• said subscriber identity module sends a set of commands to said mobile equipment, said commands enabling
5 the display on said display means to be parameterized;
and

• said commands are executed by said mobile equipment on said display means.

In order to implement this method, the invention
10 also provides a radiocommunications system including a
subscriber identity module co-operating with a piece of
mobile equipment possessing display means, said
subscriber identity module possessing means for sending a
set of commands enabling the display on said display
15 means to be parameterized, and said piece of mobile
equipment possesses means for executing said commands on
said display means.

Other characteristics and advantages of the invention will appear on reading the following
20 description of a preferred embodiment of the invention
given by way of non-limiting indication and with
reference to the accompanying drawings, in which:

• Figure 1 shows a radiocommunications system constituting a particular embodiment of the invention,
25 and comprising a subscriber identity module and a piece
of mobile equipment; and

• Figures 2a to 2c show different configurations of the display on the display means associated with the radiocommunications mobile equipment.

30 This description is made in the context of ETSI recommendations GSM 11.11 and GSM 11.14. Nevertheless, the person skilled in the art can naturally extend this particular implementation to other radiocommunications systems.

35 In accordance with recommendation GSM 11.11 and as shown in Figure 1, a radiocommunications terminal is made

up of a subscriber identity module SIM and a piece of mobile equipment ME.

The communications protocol and the interface between these two elements are described by
5 recommendation GSM 11.11 for general aspects and recommendation GSM 11.14 for the various functions that the SIM can send to the ME.

In those recommendations, the protocol is of the master/slave type, with the ME always having the role of
10 master. This means, in particular, that the SIM can transmit a command to the ME only at the request of the ME.

The mechanism whereby the SIM sends a command to the ME is described more precisely in paragraph 6.1 of
15 recommendation GSM 11.14: when the ME sends a command to the SIM, the SIM returns a result message which includes a status field.

A certain value in the status field informs the ME that the SIM seeks to send a "proactive" command. At
20 that moment, the ME issues a special FETCH command which recovers the proactive command.

In an implementation of the invention, a new "activation" command C_E is added to the set of proactive commands of the SIM in order to enable the display means
25 to be divided into one or more display areas.

This command can have several parameters.

A first parameter can be the number of display areas.

A second parameter can specify the positions of the various display areas. In particular, the second
30 parameter can specify whether the areas extend horizontally or vertically.

A third parameter can specify the sizes of the various display areas.

35 A fourth parameter can, in particular, specify the appearance of the borders around the display areas. In particular, it can indicate whether or not the display

areas are to have a visible border. Optionally, this parameter or some other parameter can specify the type of border that is to be displayed (border thickness, single or double lines, ...).

5 Figures 2a to 2c show various possible display area layouts, as a function of different combinations of these parameters.

10 Figures 2a and 2b show two layouts each having two display areas. In Figure 2a, the areas A_{a1} and A_{a2} extend horizontally and are of different sizes. In Figure 2b, the display areas A_{b1} and A_{b2} are identical in size and they extend vertically. Finally, the layout of Figure 2c has three display areas A_{c1} , A_{c2} , and A_{c3} of different sizes and extending horizontally.

15 These various layouts can be obtained by giving appropriate values to the parameters mentioned above.

It should be observed that the list of parameters given is not exhaustive.

20 In a particular implementation of the invention, a second or "selection" command C_s can be added to the set of proactive commands of the SIM. Its purpose is to enable a particular display area to be selected for responding to subsequently issued display commands.

25 This command thus has a parameter identifying a display area selected from the set of display areas as determined by the preceding "activation" command C_E .

30 The subsequent display commands are all commands taken from the proactive command set of the SIM and they are provided to cause the display means V associated with the mobile equipment ME to display something. In the set of proactive commands given by recommendation GSM 11.14, these commands are: SELECT ITEM, DISPLAY TEXT, SET UP MENU, GET INKEY, and GET INPUT. Other commands added to this set could also be concerned.

35 Thus, each time the SIM sends one of these commands to the ME , it directs the corresponding display to the

display area that has been specified by the preceding command C_s .

In this way, the existing proactive commands are not modified, but can nevertheless take advantage of the display parameters.

In a particular implementation of the invention, a third or "deactivation" command C_p can be added to the set of proactive commands of the SIM. The purpose of this command is to deactivate the current display parameters.

It can have the following effects:

- return to a configuration having a single display area covering the entire display means V; or
- eliminate or one or more display areas and share the resulting space between one or more other display areas.

Naturally, other possibilities can be envisaged and the present invention should not be understood as being limited to the particular examples above.

In addition, and advantageously, the method of the invention can include a prior step of determining acceptable values for the display parameters.

This step is preferably performed during initialization of the SIM. It can be constituted by the following two substeps:

- the SIM sends a command for acquiring the authorized parameters; and
- the ME sends said authorized parameters.

The acceptable parameters in question can have the following form:

- a maximum number of display areas that can be displayed simultaneously on the display means;
- a Boolean value specifying whether a vertical layout of display areas is authorized; and
- a Boolean value indicating whether a horizontal layout of display areas is authorized.

CLAIMS

- 1/ A method of parameterizing the display on display means (V) associated with a piece of radiocommunications mobile equipment (ME) co-operating with a subscriber identity module (SIM), the method having the following steps in order:
- said subscriber identity module (SIM) sends a set of commands to said mobile equipment (ME), said commands enabling the display on said display means (V) to be parameterized; and
 - said commands are executed by said mobile equipment (ME) on said display means (V).
- 2/ A method according to the preceding claim, characterized in that said set of commands includes an activation command (C_E) enabling the display means (V) to be divided into one or more display areas.
- 3/ A method according to either preceding claim, characterized in that said set of commands includes a selection command (C_S) enabling a particular display area to be selected on which subsequent display commands are to be displayed.
- 4/ A method according to any preceding claim, characterized in that said set of commands includes a deactivation command (C_D) enabling the current display parameters of said display means (V) to be deactivated.
- 5/ A method according to any one of claims 2 to 4, characterized in that said activation command (C_E) includes one or more parameters from the following set:
- number of said display areas;
 - positions of said display areas;
 - sizes of said display areas; and
 - border appearance of said display areas.



6/ A method according to any one of claims 2 to 5,
characterized in that said activation command (C_a) and/or
said selection command (C_s) and/or said deactivation
command (C_d) is a command taken from the set of commands
5 of said subscriber identity module (SIM), as defined by
ETSI recommendations GSM 11.11 and GSM 11.14.

7/ A method according to any preceding claim,
characterized in that it includes a prior step of
10 determining authorized parameters, the prior step
comprising the following substeps:

- the subscriber identity module (SIM) sends a
command for acquiring said authorized parameters; and
- the mobile equipment (ME) sends said authorized
15 parameters.

8/ A radiocommunications system including a subscriber
identity module (SIM) co-operating with a piece of mobile
equipment (ME) possessing display means (V), said
20 subscriber identity module (SIM) possessing means for
sending a set of commands enabling the display on said
display means (V) to be parameterized, and said piece of
mobile equipment possesses means for executing said
commands on said display means.

25 9/ A radiocommunications system according to the
preceding claim, characterized in that said set of
commands includes an activation command (C_a) enabling the
display means (V) to be divided into one or more display
30 areas.

10/ A radiocommunications system according to claim 8 or
9, characterized in that said set of commands includes a
selection command (C_s) enabling a particular display area
35 to be selected on which subsequent display commands are
to be displayed.



11/ A radiocommunications system according to any one of claims 8 to 10, characterized in that said set of commands includes a deactivation command (C_D) enabling the current display parameters of said display means (V) to be deactivated.

12/ A radiocommunications system according to any one of claims 9 to 11, characterized in that said activation command (C_E) includes one or more parameters from the following set:

- number of said display areas;
- positions of said display areas;
- sizes of said display areas; and
- border appearance of said display areas.

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13/ A radiocommunications system according to any one of claims 9 to 12, characterized in that said activation command (C_E) and/or said selection command (C_S) and/or said deactivation command (C_D) is a command taken from the set of commands of said subscriber identity module (SIM), as defined by ETSI recommendations GSM 11.11 and GSM 11.14.

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