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Title: Requirements for MMI specification

Document for: Discussion

1. Introduction

In this document, it is mentioned only about requirements of MMI specification for IMT-2000 systems. MS features are not included.

2. Discussion

The requirements of MMI specification for IMT-2000 systems should be defined a minimum sets. And necessary items must be included this specification. The requirements of MMI specification are only mentioned about MMI of MS. It is a basis with GSM 02.30 and GSM 02.07 of the ETSI.

As a result of investigation, some items were extracted as requirements of MMI; as follows,

- Display of Called Number
- Indication of Call Progress Signals
- Country/PLMN Indication
- Country/PLMN Selection
- Keypad
- International Access Function (“+” key)
- Subscription Identify Management
- Supplementary Service Control
- SIM interface

About the specification, see the appendix A.

A. Display of Called Number

This feature enables the caller to check before call setup whether the selected number is correct.

B. Indication of Call Progress Signals

Indications shall be given such as tones, recorded messages or visual display based on signalling information returned from the PLMN. On data calls, this information may be signalled to the DTE.

C. Country/PLMN Indication

The country/PLMN indicator shows the IMT-2000 PLMN, in which the MS is currently registered.

D. Country/PLMN Selection

When more than one PLMN is available in a given area, it is possible to provide the procedures for selection of PLMN.

E. Keypad

The physical means of entering the characters 0-9, * and # may be keypad, voice input device, DTE or other, but there must be means to enter this information. The relationship on the keypad between the numbers and letters is defined.

F. International Access Function (“+” key)

Provision is made for a direct, standard method of gaining international access. For this purpose the MS may have a key whose primary or secondary function is marked "+". This is signalled over the air interface and would have the effect of generating the international access code in the network.

G. Subscription Identify Management

If the SIM is removable by the user, its removal detaches the MS, causing a call in progress to be terminated, and preventing the initiation of further calls.

H. Supplementary Service Control

The MS shall support the MMI procedure specified.

- Activation
- Deactivation
- Interrogation
- Registration
- Erasure

Among “Supplementary Service Control” of GSM 02.30 Section 4.5, a necessary

part is applied for IMT-2000 system.

I. SIM interface

2.9.1 Entry of PIN and PIN2

After insertion of the IC card while the MS is switched on, or when the MS is switched on while the IC card is inserted, or when the MS is switched on in the case of a plug-in SIM, an indication is given to the user that the PIN must be entered, unless the PIN is not applicable.

2.9.2 Status information - return codes

The SIM gives status information, as responses to instructions, in two-byte codes. Some of the possible return codes are deeply related to the user's actions and should therefore be indicated to her. It is mandatory to give the user the appropriate indication.

2.9.3 Presentation of IMEI

The procedure shall instruct the ME to display its IMEI.

3. Proposal

As mentioned above, we require that requirements of MMI of MS should be standardised in IMT-2000 system. It needs to be described in the document UMTS22.07.

Appendix A

1 General

1.1 Basic philosophy

The basic idea behind this specification is that it should give a minimum level of requirements, with emphasis on items which are seen as important from World Wide usage point of view. This means, that the requirements are mainly dealing with standardized control procedures of access to services i.e. invocation of supplementary services and so on. This also includes standardized network information to the users such as tones and announcements.

2 Physical user interface features

User interface features are qualified as mandatory or optional. Mandatory features have to be implemented as long as they are relevant to the MS type. Whether or not an optional feature is implemented is left to the manufacturers' discretion. The method of implementation of all MS features must be done in accordance with the appropriate IMT-2000 system specifications. In the following table 1, Physical user interface features are listed. Mandatory features are marked by "M". Optional features are marked by "O".

Unless otherwise stated for a particular feature, the feature supported by the Subscriber Identity Module (SIM) takes priority over the same feature supported by the Mobile Equipment (ME).

Table 1: Physical user interface features

	Name	Mandatory (M) Optional (O)
2.1	Display of Called Number	M
2.2	Indication of Call Progress Signals	M
2.3	Country/PLMN Indication	M
2.4	Country/PLMN Selection	M
2.5	Keypad	O
2.6	International Access Function ("+" key)	O
2.7	Subscription Identify Management	M

2.1 Display of Called Number

This feature enables the caller to check before call setup whether the selected number is correct.

(note)

Mandatory where a human interface is provided.

2.2 Indication of Call Progress Signals

Indications shall be given such as tones, recorded messages or visual display based on signalling information returned from the PLMN. On data calls, this information may be signalled to the DTE.

(note)

Mandatory where a human interface is provided.

2.3 Country/PLMN Indication

The country/PLMN indicator shows the IMT-2000 PLMN, in which the MS is currently registered. This indicator is necessary so that the user knows when "roaming" is taking place and that the choice of PLMN network is correct. The PLMN will be indicated, and the country indication is though optional. When more than one visited PLMN is available in a given area such information will be indicated.

2.4 Country/PLMN Selection

When more than one PLMN is available in a given area, it is possible to provide the procedures for selection of PLMN.

2.5 Keypad

The physical means of entering the characters 0-9, * and # may be keypad, voice input device, DTE or other, but there must be means to enter this information.

The relationship on the keypad between the numbers and letters is preferred though optional.

1	
2	ABC
3	DEF
4	GHI
5	JKL
6	MNO
7	PQRS
8	TUV
9	WXYZ
0	

2.6 International Access Function (“+” key)

Provision is made for a direct, standard method of gaining international access. For this purpose the MS may have a key whose primary or secondary function is marked "+". This is signalled over the air interface and would have the effect of generating the international access code in the network. It may be used directly when setting up a call, or entered into the memory for abbreviated dialling.

2.7 Subscription Identify Management

The IMSI is contained in a SIM, "Subscriber Identity Module". If the SIM is removable by the user, its removal detaches the MS, causing a call in progress to be terminated, and preventing the initiation of further calls.

3 Supplementary Service Control

3.1 General

The supplementary services shall be controlled in accordance with the procedures described below. All

Mobile Stations with MMI shall be able to be controlled in this way, to minimize the confusion of users using different types of Mobile Station (quite likely, due to the use of the SIM IC card) and to permit the introduction by a PLMN operator of new supplementary services, not defined at the time of the design of a Mobile Station.

3.2 Structure of the MMI

The MS shall support the MMI procedure specified as:

Activation	:	*SC*SI#
Deactivation	:	#SC*SI#
Interrogation	:	*#SC*SI#
Registration	:	*SC*SI# and **SC*SI#
Erasure	:	##SC*SI#

This structure consists of the following parts:

- Service Code, SC(2 or 3 digits);
- Supplementary Information, SI (variable length).

The procedure always starts with *, #, **, ## or *# and is finished by #. Each part within the procedure is separated by *.

The service code uniquely specifies the Supplementary Service, either as a defined IMT-2000 system Supplementary Service or as a spare service code. All spare service codes shall be reserved for future use. Use of SIA, SIB, SIC for a particular procedure is optional. The procedure to be adopted where these are not all used is as follows:

*SI# shall be entered in any of the following formats:

```
* SIA * SIB * SIC #
* SIA * SIB #
* SIA * * SIC #
* SIA #
* * SIB * SIC #
* * SIB #
* * * SIC #
#
```

(note)

It is assumed about the Service Code (SC) and the Supplementary Information (SI) as follows; when there are services equivalent to IMT-2000 system standard, a necessary items of annex B and C of the GSM 02.30 are applied for IMT-2000 specification.

3.3 Handling of supplementary services

The MMI procedure for the defined IMT-2000 system Supplementary Services shall be converted to the mobile radio interface Layer 3, as specified in other specifications.

3.4 Registration of new password

The following procedure permits the user to change the password relating to use of Supplementary Services. The only control procedure supported is Registration of a new password, which replaces any previous password for the same service. The password may not be Erased or Interrogated.

Procedure:

```
* 03 * ZZ * OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #
```

The MS shall also support the alternative procedure:

```
** 03 * ZZ * OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #
```

4 SIM interface

4.1 Entry of PIN and PIN2

After insertion of the IC card while the MS is switched on, or when the MS is switched on while the IC card is inserted, or when the MS is switched on in the case of a plug-in SIM, an indication is given to the user that the PIN must be entered, unless the PIN is not applicable.

If the user wishes to perform a function protected by PIN2, an indication shall be given to the user that PIN2 must be entered.

The PIN or PIN2 being entered is not revealed in any way. The PIN or PIN2 check is performed by entering the # function.

4.2 Status information - return codes

The SIM gives status information, as responses to instructions, in two-byte codes. Some of the possible return codes are deeply related to the user's actions and should therefore be indicated to her.

It is mandatory to give the user the appropriate indication (respectively) when the following codes appear:

code		description;
92 40	-	Memory Problem (eg. Update impossible);
98 04	-	Access conditions not fulfilled (eg. secret code verify rejected);
98 40	-	Unsuccessful CHV verification, no attempt left (eg. Secret code locked);
6F XX	-	Technical problem with no diagnostic given.

The status information indication can be a dedicated lamp, text-string or others, as long as it is unambiguously made available to the user via the MMI.

As regards all other codes, it is left to the manufacturers' discretion whether and how the user shall be informed.

4.3 Presentation of IMEI

The following procedure shall instruct the ME to display its IMEI:

*#06#

The procedure shall be accepted and performed with and without an inserted SIM. The ME shall then display the 14 digits of the IMEI (not including the spare digit), the Check Digit and optionally the Software Version Number (as a single string, in that order).