Technical Specification Group Services and System Aspects
Meeting #18, New Orleans, USA, 9-12 December 2002

TSGS#17(02)0651

Source: **SA1**

Title: **Release 5/6 CRs to 22.101 on Support of SIM and USIM in REL-5/6**

Document for: **Approval**

Agenda Item: **7.1.3**

SA Doc	Spec	CR	Rev	Phase	Cat	Subject	Old Vers	New Vers	SA1 Doc
SP-020651	22.101	112		Rel-5	F	CR to 22.101 on Support of SIM and USIM in REL-5	5.7.0	5.8.0	S1-022339
SP-020651	22.101	113		Rel-6	A	CR to 22.101 on Support of SIM and USIM in REL-6	6.1.0	6.2.0	S1-022340

3GPP TSG-SA-1 Meeting #18 **S1-022339**
Busan, Korea, 11-15 november 2002

CR-Form-v7

CHANGE REQUEST

⌘ **22.101** **CR** **112** ⌘ **-** ⌘ Current version: **5.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [X] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Support of SIM and USIM in REL-5
Source:	⌘	SA1 (Gemplus)
Work item code:	⌘	TEI5
Date:	⌘	04/11/2002
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
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Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The fact that SIM support is optional from REL-5 on is not completely reflected in the current version of 22.101
Summary of change:	⌘	Modifications of the text whenever there are requirements on SIM or on the support of SIM
Consequences if not approved:	⌘	Inconsistency within the specs.

Clauses affected:	⌘	3.1, 3.2, 10.1, 11.3, 11.5, 13.1.1, 13.2.1, 14, A.3, A.4, A.19

Other specs affected: ⌘	Y	N		⌘
			Other core specifications	
			Test specifications	
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Other comments: ⌘

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3.1 Definitions

For the purposes of this TS, the following definitions apply:

~~**Authentication:** a property by which the correct identity of an entity or party is established with a required assurance. The party being authenticated could be a user, subscriber, home environment or serving network.~~

~~**Bearer:** a bearer capability of defined capacity, delay and bit error rate, etc.~~

~~**Bearer capability:** a transmission function which the user equipment requests to the network.~~

~~**Confidentiality:** the avoidance of disclosure of information without the permission of its owner.~~

~~**Home Environment:** see definition in [29].~~

~~**IC Card:** a card holding an Integrated Circuit containing subscriber, end user, authentication and/or application data for one or more applications.~~

~~**Integrity:** (in the context of security) is the avoidance of unauthorised modification of information.~~

~~**Mobility:** the ability for the user to communicate whilst moving independent of location.~~

~~**Multimedia service:** Multimedia services are services that handle several types of media such as audio and video in a synchronised way from the user's point of view. A multimedia service may involve multiple parties, multiple connections, and the addition or deletion of resources and users within a single communication session.~~

~~**Number:** A string of decimal digits that uniquely indicates the public network termination point. The number contains the information necessary to route the call to this termination point.~~

~~A number can be in a format determined nationally or in an international format. The international format is known as the International Public Telecommunication Number which includes the country code and subsequent digits, but not the international prefix.~~

~~**Number portability:** where the provision of directory numbers is independent of home environment and/or serving network.~~

~~**One Stop Billing**: one bill for all charges incurred using PLMN services.~~

~~**Quality of Service:** the collective effect of service performances, which determine the degree of satisfaction of a user of a service. It is characterised by the combined aspects of performance factors applicable to all services, such as:~~

- ~~service operability performance;~~
- ~~service accessibility performance;~~
- ~~service retention performance;~~
- ~~service integrity performance;~~
- ~~and other factors specific to each service.~~

~~**Roaming:** the ability for a user to function in a serving network.~~

~~**Security:** the ability to prevent fraud as well as the protection of information availability, integrity and confidentiality.~~

~~**Service:** is set of functions offered to a user by an organisation.~~

~~**Service Control:** is the ability of the user, home environment or serving environment to determine what a particular service does, for a specific invocation of that service, within the limitations of that service.~~

Service Provider: A Service Provider is either a network operator or an other entity that provides services to a subscriber (e.g. a MVNO)

Serving Network: the serving network provides the user with access to the services of home environment.

Subscriber: A Subscriber is an entity (e.g. a user) that is engaged in a Subscription with a service provider.

Supplementary service: is a service which modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a standalone service. It must be offered together with or in association with a basic telecommunication service. The same supplementary service may be common to a number of telecommunication services.

Teleservice: is a type of telecommunication service that provides the complete capability, including terminal equipment functions, for communication between users according to standardised protocols and transmission capabilities established by agreement between operators.

User: is a logical, identifiable entity which uses services.

User Profile: is the set of information necessary to provide a user with a consistent, personalised service environment, irrespective of the user's location or the terminal used (within the limitations of the terminal and the serving network).

User Equipment: is a combination of mobile equipment (ME) and SIM/USIM.

USIM: User Service Identity Module is an application residing on the IC Card used for accessing services with appropriate security.

Virtual Home Environment: the virtual home environment is a system concept for personalised service portability between serving networks and between terminals.

Further definitions are given in 3GPP TR 21.905 [29].

3.2 Abbreviations

For the purposes of this TS, the following abbreviations apply:

BER	Bit Error Rate
CN	Core Network
DTMF	Dual Tone Multiple Frequency
ETSI	European Telecommunications Standards Institute
FDD	Frequency Division Duplex
GSM	Global System for Mobile Communications
IMT-2000	International Mobile Telecommunications 2000
IN	Intelligent Network
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union
LAN	Local Area Network
ME	Mobile Equipment
MMI	Man Machine Interface
MO	Mobile Origination
MT	Mobile Termination
O&M	Operations and Maintenance
PBX	Private Branch eXchange
PC	Personal Computer
PCMCIA	Personal Computer Memory Card International Association
PIN	Personal Identity Number
PNP	Private Numbering Plan
POTS	Plain Old Telephony Service
QoS	Quality of Service
SIM	Subscriber Identity Module
SMS	Short Message Service
TDD	Time Division Duplex
UICC	UMTS IC Card
UE	User Equipment
USIM	User Service Identity Module
UMTS	Universal Mobile Telecommunications System

~~VHE Virtual Home Environment~~

Further abbreviations are given in 3GPP TR 21.905 [29].

10.1 General requirements

It shall be possible to establish an emergency speech call. Emergency calls will be routed to the emergency services in accordance with national regulations for where the subscriber is located. This may be based upon one or more default numbers stored in the ME. It shall be allowed to establish an emergency call without the need to dial a dedicated number to avoid the mis-connection in roaming case, such as menu, by use of a 'red button', or a linkage to a car air bag control. Emergency Calls shall be supported by the UE without a SIM/USIM being present. No other type than Emergency calls shall be accepted without a SIM/USIM.

The Emergency service is required only if the UE supports voice.

Note: It will be left to the national authorities to decide whether the network should accept emergency calls without the SIM/USIM.

It shall be possible to initiate emergency calls to different emergency call centers, depending on the type of emergency. The following types of emergency calls shall be possible:

- Police
- Ambulance
- Fire Brigade
- Marine Guard
- Mountain Rescue
- Spare, at least [three] different types

When a SIM/USIM is present, subscriber specific emergency call set-up MMI shall be provided. The Home Environment operator shall specify preferred emergency call MMI(s) (e.g. 911 for US citizens or 110, 118 and 119 for Japanese citizens). This shall be stored in the SIM/USIM and the ME shall read this and use any entry of these digits to set up an emergency call. It shall be possible to store more than one instance of this field.

Note: Release '98 and earlier SIM cards have the capability to store additional emergency call set-up MMI. However in many cases this has not been used.

It shall be possible to tie any emergency call number, specified in the preferred emergency call MMI(s) above, to any single emergency call type or to any combination of emergency types. The association between emergency numbers and emergency call type shall be able to be programmed by the Home Environment operator into the SIM/USIM.

Example:

19	Police (Albania)
100	Police and Fire Brigade (Greek cities)
100	Ambulance and Fire Brigade (Belgium)
112	Police and Ambulance (Italy)
112	General emergency call, all categories (Sweden)
115	Fire Brigade (Italy)
114	Ambulance (Austria)

Note: if the UE does not recognise the emergency call MMI(s) (i.e. the dialled number is not stored in SIM/USIM) but the serving network recognises the dialled number as an emergency call number used in the country, a normal call set up takes place over the radio interface and after the serving network has recognised the emergency number the call is routed as an emergency call.

When a SIM/USIM containing stored emergency numbers is present, only those numbers are identified as emergency

numbers, i.e. default emergency numbers stored in the ME are ignored.

The following emergency numbers shall be stored in the ME for use when no emergency numbers are stored in the SIM/USIM: 000, 08, 112, 110, 911 and 999.

Note: Emergency numbers stored in the ME, for use when no emergency numbers are stored in the SIM/USIM, should not overlap with existing service numbers used by any operator.

The user friendly MMI which specifies the type of emergency directly (e.g. menu) should be supported for use in any (i.e. home or visited) PLMN to avoid the mis-connection in roaming case. This shall be allowed to both with and without SIM/USIM being present.

The following emergency numbers shall be stored in the ME for use without SIM/USIM: 000, 08, 112, 110, 118, 119, 911 and 999.

11.3 User / USIM Identification

It is a requirement that the user can be uniquely identified by the home environment from which the service is being obtained. This identification may be unknown to the serving network on which the user is roaming.

Serving networks need to be able to communicate with, authenticate and commercially deal with the home environment associated with any ~~SIM/~~USIM, and optionally SIM, being registered on their network. This shall require an ~~SIM/USIM~~ identity scheme which uniquely identifies each ~~SIM/~~USIM, and a mapping scheme which allows the USIM identity to be used as a identifier with the "owning" home environment.

Serving networks also require to be able to route efficiently any communication to and from ~~SIM/~~USIMs, and optionally SIMs, (or rather the devices on which they are registered). An address scheme is therefore required for operators to access and map any outgoing or incoming communication to SIM/USIMs and thus devices on their networks

It shall be possible for several numbers to be associated with a single subscription on a single UICC.

11.5 Home Environment / Serving Network Identification

~~Serving networks need to be able to communicate with, authenticate and commercially deal with the home environment associated with any SIM/USIM being registered on their network. This shall require a SIM/USIM identity scheme which uniquely identifies each SIM/USIM, and a mapping scheme which allows the SIM/USIM identity to be used as a identifier with the "owning" home environment.~~

Home / serving environments need to route communication to the current location of the user. This shall require a identity scheme which uniquely identifies the serving environment and shall be used for routing purposes.

13.1.1 The USIM

Every USIM shall have a unique identity and shall be associated with one and only one home environment.

It shall be possible for a home environment to uniquely identify a user by the USIM.

The USIM shall be used to provide security features.

For access to services, provided by PS or CS CN domains, a valid USIM shall be required.

The USIM shall be able to support SIM Application Toolkit as specified in 3GPP TS 22.038 [3].

The USIM shall reside on a UICC, 3GPP specifications shall adopt both of the GSM SIM card physical formats. Other formats may also be supported. USIM specific information shall be protected against unauthorised access or alteration.

It shall be possible to update USIM specific information via the air interface, in a secure manner.

Access to the IMS services shall be possible using 3GPP release 99 and release 4 UICCs.

Annex A describes a number of features that may optionally be supported by the UE and thus USIM.

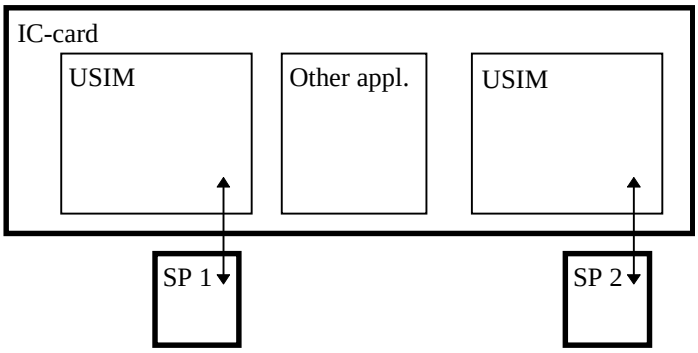
13.2.1 The UICC and Applications other than the USIM or ISIM

It shall be possible for the UICC to host other applications in addition to the USIM or ISIM, see figure 3. Service providers, subscribers or users may need to establish additional data or processes on the UICC. Each application on an UICC shall reside in its own domain (physical or logical). It shall be possible to manage each application on the card separately. The security and operation of an application in any domain shall not be compromised by an application running in a different domain. Applications may need to use their own security mechanisms which are separate to those specified by 3GPP e.g. electronic commerce applications.

Examples of ~~other~~ UICC applications are: USIM, ISIM, off-line user applications like UPT, electronic banking, credit service, etc.

Applications should be able to share some information such as a common address book.

It shall be possible to address applications, which reside on the UICC, via the air interface.



14 Types of features of UEs

3GPP specifications should support a wide variety of user equipment, i.e. setting any limitations on terminals should be avoided as much as possible. For example user equipment like hand-portable phones, personal digital assistants and laptop computers can clearly be seen as likely terminals.

In order not to limit the possible types of user equipment they are not standardised. The UE types could be categorised by their service capabilities rather than by their physical characteristics. Typical examples are speech only UE, narrowband data UE, wideband data UE, data and speech UE, etc..

In order to enhance functionality split and modularity inside the user equipment the interfaces of UE should be identified. Interfaces like UICC-interface, PCMCIA-interface and other PC-interfaces, including software interfaces, should be covered by references to the applicable interface standards.

UEs have to be capable of supporting a wide variety of teleservices and applications provided in PLMN environment. Limitations may exist on UEs capability to support all possible teleservices and information types (speech, narrowband data, wideband data, video, etc.) and therefore functionality to indicate capabilities of a UE shall be specified.

The basic mandatory UE requirements are:

- Support for USIM. Optional support of GSM phase 2 and 2+ SIM cards. P~~,~~ ~~p~~hase 1~~,~~ 5V SIM cards shall not be supported;
- Home environment and serving network registration and deregistration;
- Location update;
- Originating or receiving a connection oriented or a connectionless service;
- An unalterable equipment identification; IMEI, see 3GPP TS 22.016 [12];
- Basic identification of the terminal capabilities related to services such as; the support for software downloading, application execution environment/interface, MExE terminal class, supported bearer services.
- Terminals capable for emergency calls shall support emergency call without a SIM/USIM.
- Support for the execution of algorithms required for encryption, for CS and PS services. Support for non encrypted mode is required;
- Support for the method of handling automatic calling repeat attempt restrictions as specified in 3GPP TS 22.001 [4];
- At least one capability type shall be standardised for mobile terminals supporting the GERAN and UTRAN radio interfaces.
- Under emergency situations, it may be desirable for the operator to prevent UE users from making access attempts (including emergency call attempts) or responding to pages in specified areas of a network, see 3GPP TS 22.011 [11];
- Ciphering Indicator for terminals with a suitable display;

  The ciphering indicator feature allows the ~~ME~~ UE to detect that ciphering is not switched on and to indicate this to the user. The ciphering indicator feature may be disabled by the home network operator setting data in the SIM/USIM. If this feature is not disabled by the SIM/USIM, then whenever a connection is in place, which is, or becomes unenciphered, an indication shall be given to the user. Ciphering itself is unaffected by this feature, and the user can choose how to proceed;

- Support for PLMN selection.
- Support for handling of interactions between toolkits concerning the access to UE MMI input/output capabilities;

  Whenever an application (e.g. a SAT/MExE/WAP application) requires the access to the UE MMI input/output

capabilities (e.g. display, keyboard,…), the UE shall grant this access subject to the capabilities of the UE. This shall not cause the termination of any other applications (e.g. WAP browser or MExE/SAT application) which were previously using these UE resources. The UE shall give the user the ability to accept or reject the new application. In the case that the application request is rejected, the access to the UE MMI input/output capabilities is returned to the applications which were previously using these UE resources. If the user decides to continue with the new application, then when this new application is terminated, the access to the UE MMI input/output capabilities shall be returned to the UE to be re-allocated to applications (e.g. the preceding application which was interrupted). Subject to the capabilities of the UE, the user shall have the ability to switch the MMI input/output capabilities between applications.

Note: Rejecting a request to access the UE MMI input/output capabilities by an application does not necessarily mean that it is terminated, but only that the access to the UE MMI input/output capabilities are not granted to this application. Handling of rejection (termination, put on hold,…) is the responsibility of the application.

Annex A describes a number of features which may optionally be supported by the ~~ME~~UE.

A.3 Country/PLMN indication

The country/PLMN indicator shows in which PLMN the UE is currently registered. This indicator is necessary so that the user knows when "roaming" is taking place and that the choice of PLMN is correct. Both the country and PLMN will be indicated. When more than one visited PLMN is available in a given area such information will be indicated.

The PLMN name is either:

- Stored in the ME and associated with the MCC+MNC combination received on the broadcast channel;
- NITZ (see 22.042 [17]) (in which case it overrides the name stored in the UE);
- stored in the USIM and associated with the MCC+MNC combination, and optionally the LAI, received on the broadcast channel (in which case it overrides the name stored in the UE and – if present – the NITZ name).

It shall be possible to store on the ~~SIM/~~USIM at least 10 PLMN Identifications (MCC+MNC combination and optionally the LAI) for which the same PLMN name shall be displayed.

The PLMN name stored in the USIM has the highest priority, followed by the PLMN name provided by NITZ. The PLMN name stored in the ME has the lowest priority.

A.4 Service Provider Name indication

The service provider name is stored in the ~~SIM/~~USIM in text and/or optionally graphic format. It shall be possible to associate at least 10 PLMN Identifications (MCC+MNC combination and optionally the LAI) with the same SP Name.

When registered on the HPLMN, or one of the PLMN Identifications used for Service Provider Name display:

(i) The SP Name shall be displayed;

(ii) Display of the PLMN Name is optional (i.e. the Service Provider name shall be displayed either in parallel to the PLMN Name or instead of the PLMN Name).

When registered on neither the HPLMN, nor one of the PLMN Identifications used for Service Provider Name display:

(i) The PLMN name shall be displayed;

(ii) Display of the SP Name is optional.

If the UE is unable to display the full name of the Service Provider the name is cut from the tail end. The storage of Service Provider name and options, and choice of options, shall be under control of the network operator.

A.19 Abbreviated dialling

The directory number or part of it is stored in the mobile equipment together with the abbreviated address. After retrieval the directory number may appear on the display.

Abbreviated dialling numbers stored in the UE or ~~SIM/~~USIM may contain wild characters.

If wild characters are used to indicate missing digits, each wild character shall be replaced for network access or supplementary service operation, by a single digit entered at the keypad. The completed directory number is transmitted on the radio path.

3GPP TSG-SA-1 Meeting #18 **S1-022340**
Busan, Korea, 11-15 november 2002

CR-Form-v7

CHANGE REQUEST

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Source:	⌘	Gemplus
Work item code:	⌘	TEI5
Date:	⌘	04/11/2002
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- Mountain Rescue
- Spare, at least [three] different types

When a SIM/USIM is present, subscriber specific emergency call set-up MMI shall be provided. The Home Environment operator shall specify preferred emergency call MMI(s) (e.g. 911 for US citizens or 110, 118 and 119 for Japanese citizens). This shall be stored in the SIM/USIM and the ME shall read this and use any entry of these digits to set up an emergency call. It shall be possible to store more than one instance of this field.

Note: Release '98 and earlier SIM cards have the capability to store additional emergency call set-up MMI. However in many cases this has not been used.

It shall be possible to tie any emergency call number, specified in the preferred emergency call MMI(s) above, to any single emergency call type or to any combination of emergency types. The association between emergency numbers and emergency call type shall be able to be programmed by the Home Environment operator into the SIM/USIM.

Example:

19	Police (Albania)
100	Police and Fire Brigade (Greek cities)
100	Ambulance and Fire Brigade (Belgium)
112	Police and Ambulance (Italy)
112	General emergency call, all categories (Sweden)
115	Fire Brigade (Italy)
114	Ambulance (Austria)

Note: if the UE does not recognise the emergency call MMI(s) (i.e. the dialled number is not stored in SIM/USIM) but the serving network recognises the dialled number as an emergency call number used in the country, a normal call set up takes place over the radio interface and after the serving network has recognised the emergency number the call is routed as an emergency call.

When a SIM/USIM containing stored emergency numbers is present, only those numbers are identified as emergency

numbers, i.e. default emergency numbers stored in the ME are ignored.

The following emergency numbers shall be stored in the ME for use when no emergency numbers are stored in the SIM/USIM: 000, 08, 112, 110, 911 and 999.

Note: Emergency numbers stored in the ME, for use when no emergency numbers are stored in the SIM/USIM, should not overlap with existing service numbers used by any operator.

The user friendly MMI which specifies the type of emergency directly (e.g. menu) should be supported for use in any (i.e. home or visited) PLMN to avoid the mis-connection in roaming case. This shall be allowed to both with and without SIM/USIM being present.

The following emergency numbers shall be stored in the ME for use without SIM/USIM: 000, 08, 112, 110, 118, 119, 911 and 999.

11.3 User / USIM Identification

It is a requirement that the user can be uniquely identified by the home environment from which the service is being obtained. This identification may be unknown to the serving network on which the user is roaming.

Serving networks need to be able to communicate with, authenticate and commercially deal with the home environment associated with any ~~SIM/~~USIM, and optionally SIM, being registered on their network. This shall require ~~a SIM/USIM~~an identity scheme which uniquely identifies each ~~SIM/~~USIM, and a mapping scheme which allows the USIM identity to be used as a identifier with the "owning" home environment.

Serving networks also require to be able to route efficiently any communication to and from ~~SIM/~~USIMs, and optionally SIMs, (or rather the devices on which they are registered). An address scheme is therefore required for operators to access and map any outgoing or incoming communication to SIM/USIMs and thus devices on their networks

It shall be possible for several numbers to be associated with a single subscription on a single UICC.

11.5 Home Environment / Serving Network Identification

~~Serving networks need to be able to communicate with, authenticate and commercially deal with the home environment associated with any SIM/USIM being registered on their network. This shall require a SIM/USIM identity scheme which uniquely identifies each SIM/USIM, and a mapping scheme which allows the SIM/USIM identity to be used as a identifier with the "owning" home environment.~~

Home / serving environments need to route communication to the current location of the user. This shall require a identity scheme which uniquely identifies the serving environment and shall be used for routing purposes.

13.1.1 The USIM

Every USIM shall have a unique identity and shall be associated with one and only one home environment.

It shall be possible for a home environment to uniquely identify a user by the USIM.

The USIM shall be used to provide security features.

For access to services, provided by PS or CS CN domains, a valid USIM shall be required. Optionally, SIM according to GSM phase 2, GSM phase 2+, 3GPP release 99, 3GPP release 4 specifications may be supported.

The USIM shall be able to support SIM Application Toolkit as specified in 3GPP TS 22.038 [3].

The USIM shall reside on a UICC, 3GPP specifications shall adopt both of the GSM SIM card physical formats. Other formats may also be supported. USIM specific information shall be protected against unauthorised access or alteration.

It shall be possible to update USIM specific information via the air interface, in a secure manner.

Access to the IMS services shall be possible using 3GPP release 99 and release 4 UICCs.

Annex A describes a number of features that may optionally be supported by the UE and thus USIM.

13.2.1 The UICC and Applications other than the USIM or ISIM

It shall be possible for the UICC to host other applications in addition to the USIM or ISIM, see figure 3. Service providers, subscribers or users may need to establish additional data or processes on the UICC. Each application on an UICC shall reside in its own domain (physical or logical). It shall be possible to manage each application on the card separately. The security and operation of an application in any domain shall not be compromised by an application running in a different domain. Applications may need to use their own security mechanisms which are separate to those specified by 3GPP e.g. electronic commerce applications.

Examples of ~~other~~ UICC applications are: USIM, ISIM, off-line user applications like UPT, electronic banking, credit service, etc.

Applications should be able to share some information such as a common address book.

It shall be possible to address applications, which reside on the UICC, via the air interface.

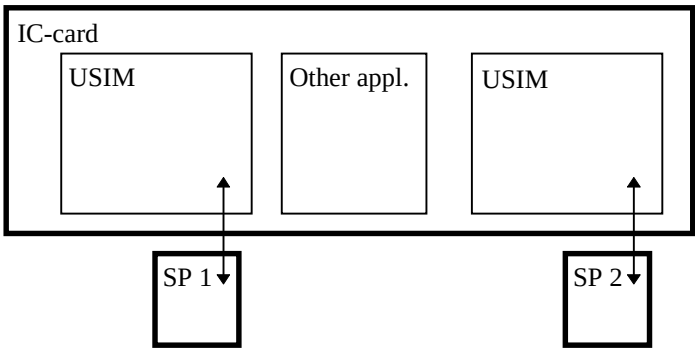

Figure 3 Example of a Multifunction UICC

14 Types of features of UEs

3GPP specifications should support a wide variety of user equipment, i.e. setting any limitations on terminals should be avoided as much as possible. For example user equipment like hand-portable phones, personal digital assistants and laptop computers can clearly be seen as likely terminals.

In order not to limit the possible types of user equipment they are not standardised. The UE types could be categorised by their service capabilities rather than by their physical characteristics. Typical examples are speech only UE, narrowband data UE, wideband data UE, data and speech UE, etc..

In order to enhance functionality split and modularity inside the user equipment the interfaces of UE should be identified. Interfaces like UICC-interface, PCMCIA-interface and other PC-interfaces, including software interfaces, should be covered by references to the applicable interface standards.

UEs have to be capable of supporting a wide variety of teleservices and applications provided in PLMN environment. Limitations may exist on UEs capability to support all possible teleservices and information types (speech, narrowband data, wideband data, video, etc.) and therefore functionality to indicate capabilities of a UE shall be specified.

The basic mandatory UE requirements are:

- Support for USIM. Optional support of GSM phase 2 and 2+ SIM cards. P~~p~~hase 1, ~~-~~5V SIM cards shall not be supported;
- Home environment and serving network registration and deregistration;
- Location update;
- Originating or receiving a connection oriented or a connectionless service;
- An unalterable equipment identification; IMEI, see 3GPP TS 22.016 [12];
- Basic identification of the terminal capabilities related to services such as; the support for software downloading, application execution environment/interface, MExE terminal class, supported bearer services.
- Terminals capable for emergency calls shall support emergency call without a SIM/USIM.
- Support for the execution of algorithms required for encryption, for CS and PS services. Support for non encrypted mode is required;
- Support for the method of handling automatic calling repeat attempt restrictions as specified in 3GPP TS 22.001 [4];
- At least one capability type shall be standardised for mobile terminals supporting the GERAN and UTRAN radio interfaces.
- Under emergency situations, it may be desirable for the operator to prevent UE users from making access attempts (including emergency call attempts) or responding to pages in specified areas of a network, see 3GPP TS 22.011 [11];
- Ciphering Indicator for terminals with a suitable display;

  The ciphering indicator feature allows the ~~ME~~ UEto detect that ciphering is not switched on and to indicate this to the user. The ciphering indicator feature may be disabled by the home network operator setting data in the SIM/USIM. If this feature is not disabled by the SIM/USIM, then whenever a connection is in place, which is, or becomes unenciphered, an indication shall be given to the user. Ciphering itself is unaffected by this feature, and the user can choose how to proceed;

- Support for PLMN selection.
- Support for handling of interactions between toolkits concerning the access to UE MMI input/output capabilities;

  Whenever an application (e.g. a SAT/MExE/WAP application) requires the access to the UE MMI input/output

capabilities (e.g. display, keyboard,…), the UE shall grant this access subject to the capabilities of the UE. This shall not cause the termination of any other applications (e.g. WAP browser or MExE/SAT application) which were previously using these UE resources. The UE shall give the user the ability to accept or reject the new application. In the case that the application request is rejected, the access to the UE MMI input/output capabilities is returned to the applications which were previously using these UE resources. If the user decides to continue with the new application, then when this new application is terminated, the access to the UE MMI input/output capabilities shall be returned to the UE to be re-allocated to applications (e.g. the preceding application which was interrupted). Subject to the capabilities of the UE, the user shall have the ability to switch the MMI input/output capabilities between applications.

Note: Rejecting a request to access the UE MMI input/output capabilities by an application does not necessarily mean that it is terminated, but only that the access to the UE MMI input/output capabilities are not granted to this application. Handling of rejection (termination, put on hold,…) is the responsibility of the application.

Annex A describes a number of features which may optionally be supported by the ~~ME~~UE.

A.3 Country/PLMN indication

The country/PLMN indicator shows in which PLMN the UE is currently registered. This indicator is necessary so that the user knows when "roaming" is taking place and that the choice of PLMN is correct. Both the country and PLMN will be indicated. When more than one visited PLMN is available in a given area such information will be indicated.

The PLMN name is either:

- Stored in the ME and associated with the MCC+MNC combination received on the broadcast channel;
- NITZ (see 22.042 [17]) (in which case it overrides the name stored in the UE);
- stored in the USIM and associated with the MCC+MNC combination, and optionally the LAI, received on the broadcast channel (in which case it overrides the name stored in the UE and – if present – the NITZ name).

It shall be possible to store on the ~~SIM/~~USIM at least 10 PLMN Identifications (MCC+MNC combination and optionally the LAI) for which the same PLMN name shall be displayed.

The PLMN name stored in the USIM has the highest priority, followed by the PLMN name provided by NITZ. The PLMN name stored in the ME has the lowest priority.

A.4 Service Provider Name indication

The service provider name is stored in the ~~SIM/~~USIM in text and/or optionally graphic format. It shall be possible to associate at least 10 PLMN Identifications (MCC+MNC combination and optionally the LAI) with the same SP Name.

When registered on the HPLMN, or one of the PLMN Identifications used for Service Provider Name display:

(i) The SP Name shall be displayed;

(ii) Display of the PLMN Name is optional (i.e. the Service Provider name shall be displayed either in parallel to the PLMN Name or instead of the PLMN Name).

When registered on neither the HPLMN, nor one of the PLMN Identifications used for Service Provider Name display:

(i) The PLMN name shall be displayed;

(ii) Display of the SP Name is optional.

If the UE is unable to display the full name of the Service Provider the name is cut from the tail end. The storage of Service Provider name and options, and choice of options, shall be under control of the network operator.

A.19 Abbreviated dialling

The directory number or part of it is stored in the mobile equipment together with the abbreviated address. After retrieval the directory number may appear on the display.

Abbreviated dialling numbers stored in the UE or ~~SIM/~~USIM may contain wild characters.

If wild characters are used to indicate missing digits, each wild character shall be replaced for network access or supplementary service operation, by a single digit entered at the keypad. The completed directory number is transmitted on the radio path.