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**Digital cellular telecommunications system;
Unstructured Supplementary Service Data (USSD) - Stage 3
(GSM 04.90 version 5.0.1)**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the stage 3 description of the Unstructured Supplementary Service Data (USSD) operations within the digital cellular telecommunications system.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE Rules.

Transposition dates	
Date of adoption:	18 April 1997
Date of latest announcement of this ETS (doa):	31 August 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	28 February 1998
Date of withdrawal of any conflicting National Standard (dow):	28 February 1998

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1 Scope

This European Telecommunication Standard (ETS) gives the stage 3 description of the Unstructured Supplementary Service Data (USSD) operations.

The group of unstructured supplementary service data operations is divided into two different classes:

- Network initiated unstructured supplementary service data operations (clause 5);
- Mobile initiated unstructured supplementary service data operations (clause 6).

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

- [1] GSM 01.04 (ETR 350): "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 04.08 (ETS 300 940): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".
- [3] GSM 04.80 (ETS 300 950): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 supplementary services specification; Formats and coding".

3 Abbreviations

Abbreviations used in this ETS are listed in GSM 01.04.

4 Cross phase compatibility

For the mobile initiated USSD operations, a number of changes exist between this ETS and the protocol version 1 specification. For these operations the main body of this ETS assumes that all network entities comply with this version of the service. In this case an additional subclause defines the additional requirements for when one or more network entities or the Mobile Station (MS) complies with the protocol version 1 specifications for the USSD operations.

5 Network initiated unstructured supplementary service data operations

5.1 Unstructured supplementary service data request

5.1.1 Normal operation

The network invokes an USSD request by sending a REGISTER message containing a UnstructuredSS-Request invoke component to the MS.

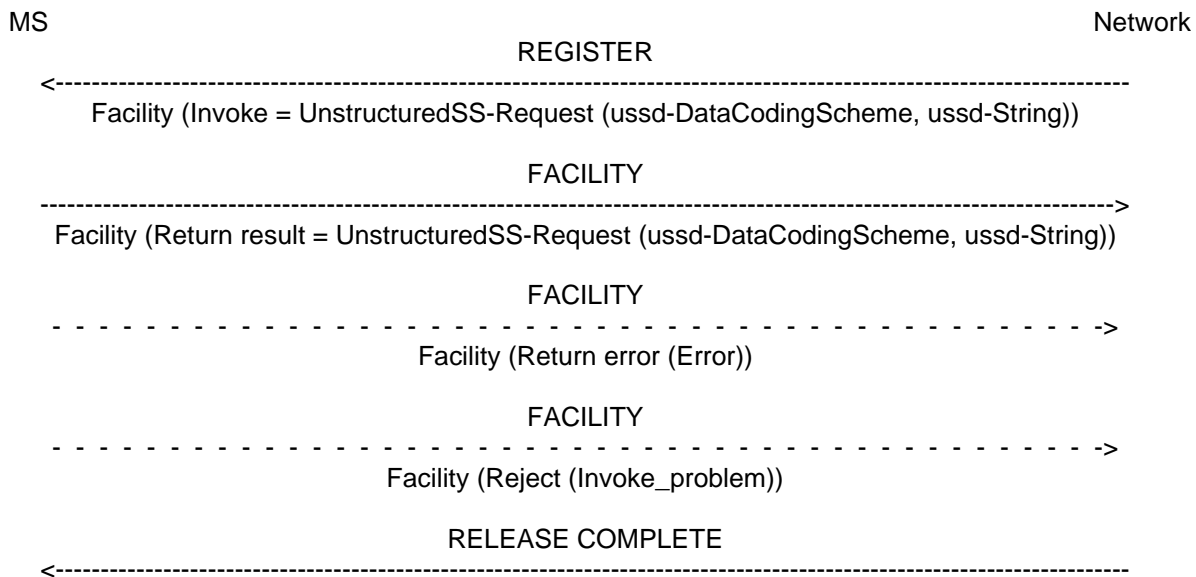
The MS shall respond to the request by sending a FACILITY message containing the user's mobile subscriber's response in a return result component. The network shall pass the data received in the response to the application handling USSD operations and shall wait for the response of the application. The application may either continue or terminate the dialogue.

When the application continues the dialogue, it may initiate another USSD operation by sending a FACILITY message (see figure 5.2). The operation may either be an USSD request or notification (see subclause 5.1.2).

When the application terminates the dialogue, the network shall clear the transaction by sending a RELEASE COMPLETE message. The MS may also clear the transaction at any time by sending a RELEASE COMPLETE message upon the request of the user.

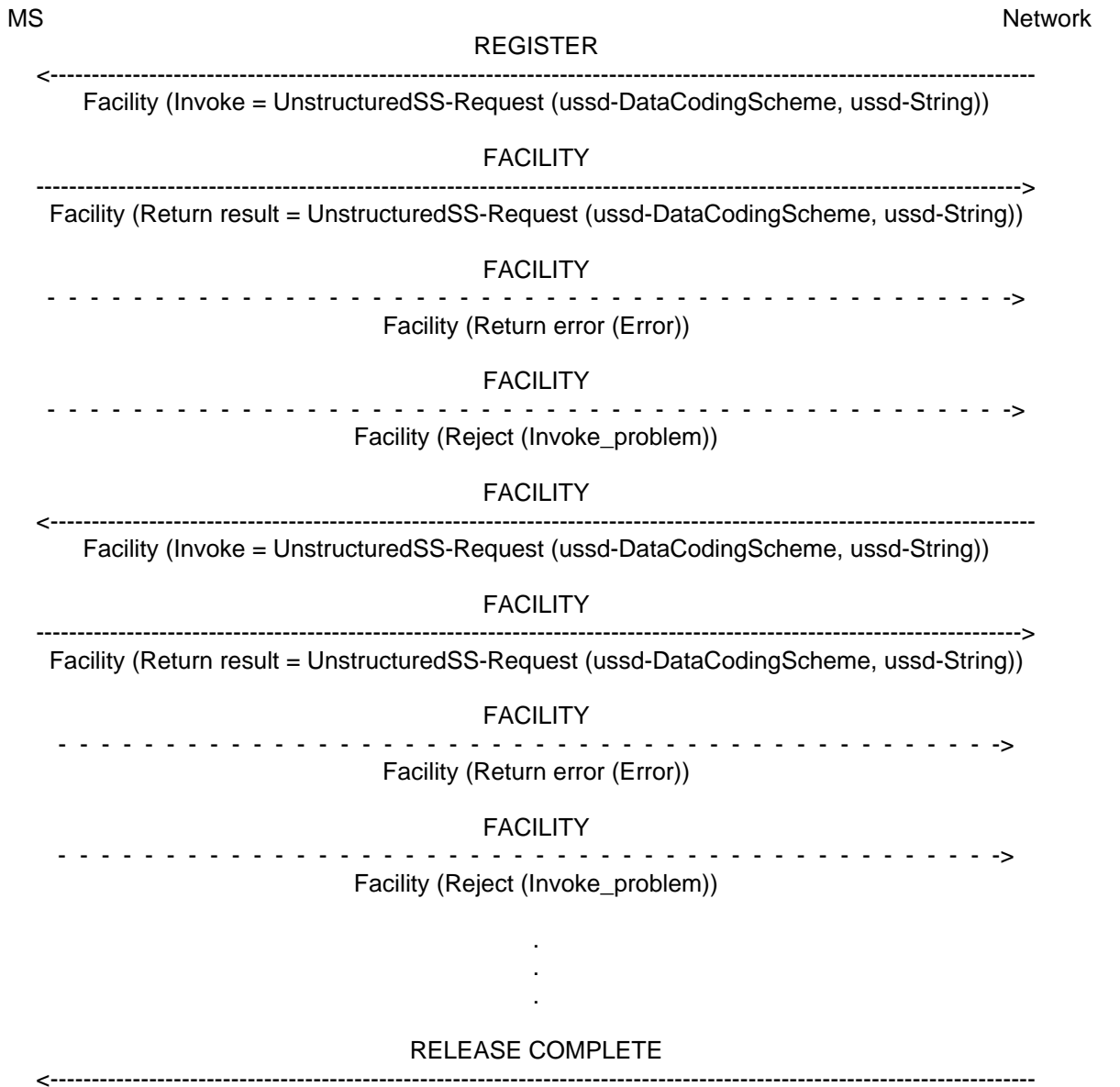
If the MS is unable to process the request received from the network, it shall return an error indication by sending a FACILITY message containing a return error component. Error values are specified in GSM 04.80.

When the MS receives an USSD operation in parallel to any call independent supplementary service transaction, it shall respond with a return error component in a RELEASE COMPLETE message, containing the 'USSD-Busy' error as specified in GSM 04.80, to indicate the failure in handling a parallel USSD operation. However, the network is allowed to initiate USSD operations in parallel to call related transactions.



NOTE: The MS may clear the transaction at any time by sending a RELEASE COMPLETE upon request of the user.

Figure 5.1: Single network initiated USSD request



NOTE 1: The MS may clear the transaction at any time by sending a RELEASE COMPLETE upon request of the user.

NOTE 2: The second USSD operation may also be an USSD notification. The network may use the on-going transaction for sending further USSD operations. Only one additional USSD request is shown.

Figure 5.2: Multiple network initiated USSD request

5.2 Unstructured supplementary service data notification

5.2.1 Normal operation

The network invokes an USSD notification by sending a REGISTER message to the MS containing a UnstructuredSS-Notify invoke component.

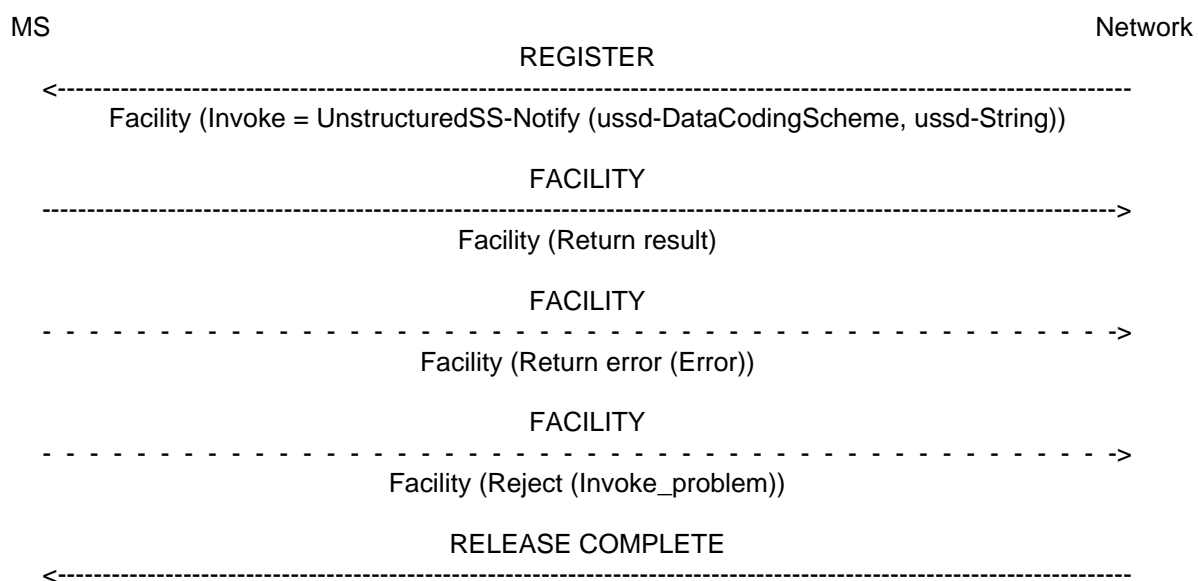
The MS shall acknowledge the operation by sending a FACILITY message containing an empty result component to the network. The application may either continue or terminate the dialogue.

When the application continues the dialogue, it may initiate another USSD operation by sending a FACILITY message (see figure 5.4). The operation may either be an USSD request (see subclause 5.1.1) or notification.

When the application terminates the dialogue, the network shall clear the transaction by sending a RELEASE COMPLETE message. The MS may also clear the transaction at any time by sending a RELEASE COMPLETE message upon request of the user.

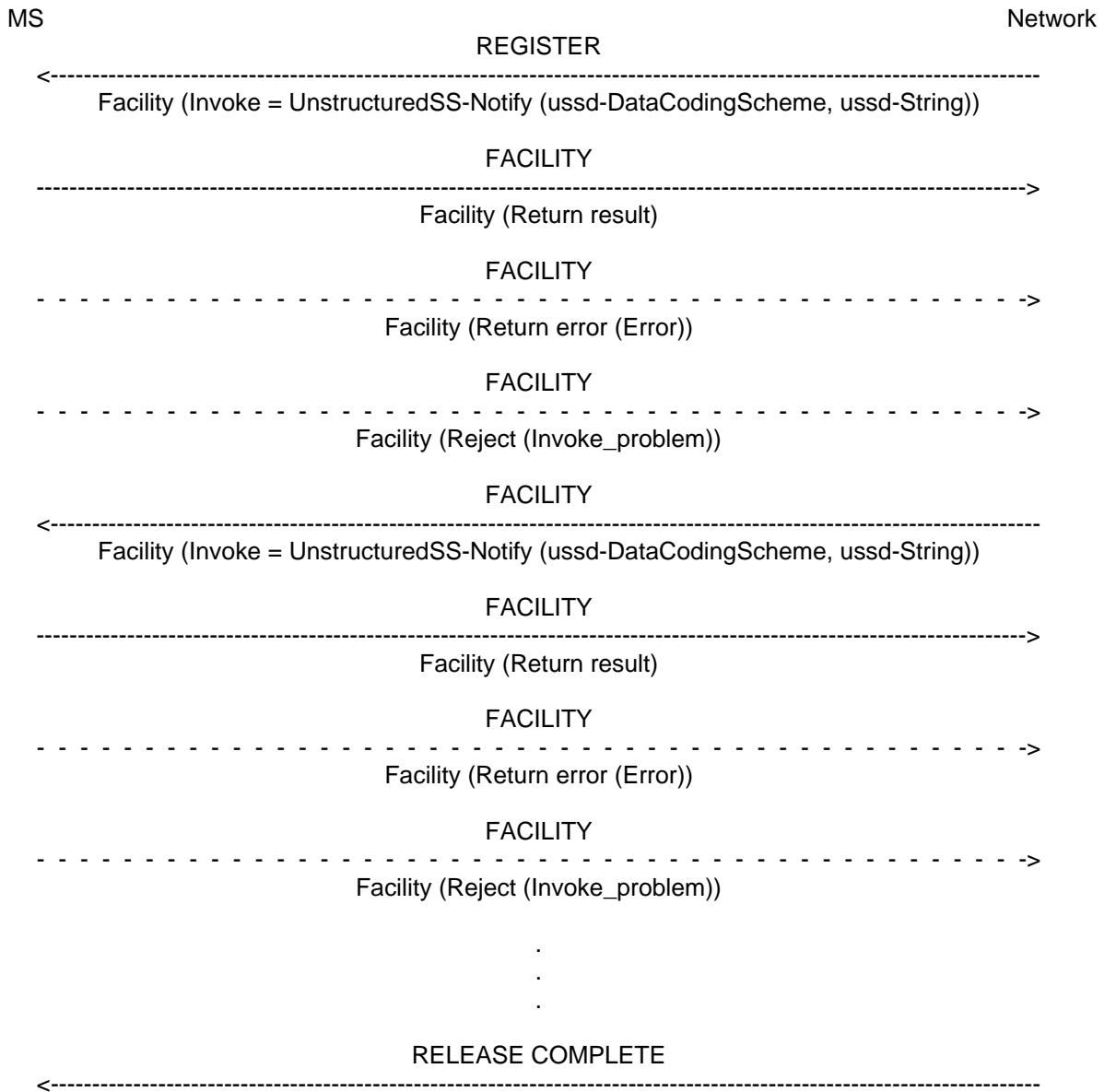
If the MS is unable to process the request received from the network, it shall return an error indication by sending a FACILITY message containing a return error component. Error values are specified in GSM 04.80.

When the MS receives an USSD operation in parallel to any call independent supplementary service transaction, it shall respond with a return error component in a RELEASE COMPLETE message, containing the 'USSD-Busy' error as specified in GSM 04.80, to indicate the failure in handling a parallel USSD operation. However, the network is allowed to initiated USSD operations in parallel to call related transactions.



NOTE: The MS may clear the transaction at any time by sending a RELEASE COMPLETE upon request of the user.

Figure 5.3: Single network initiated USSD notification



NOTE 1: The MS may clear the transaction at any time by sending a RELEASE COMPLETE upon request of the user.

NOTE 2: The second USSD operation may also be an USSD request. The network may use the on-going transaction for sending further USSD operations. Only one additional USSD notification is shown.

Figure 5.4: Multiple network initiated USSD notification

6 Mobile initiated unstructured supplementary service data operations

6.1 Normal operation

The MS invokes an USSD request by sending a REGISTER message to the network containing a ProcessUnstructuredSS-Request invoke component.

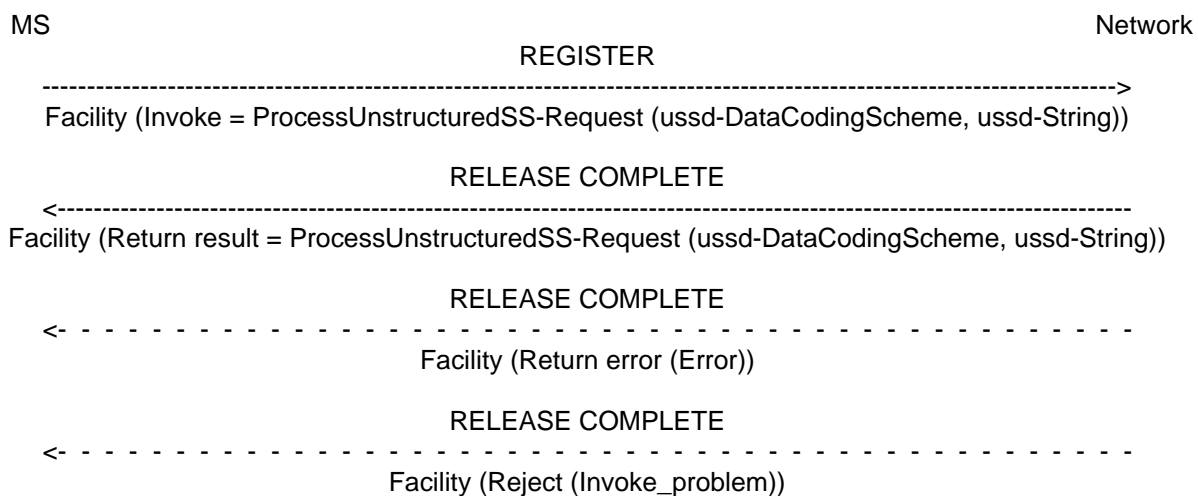
The receiving network entity shall pass the data received in the request to the application handling USSD operations and shall wait for the response of the application. The application may either terminate the dialogue or may request several times further information in order to perform the requested operation (see figures 6.1 and 6.2).

When the application requests more information to process the request, the network shall initiate an USSD request (see subclause 5.1.1), using the on-going transaction (see figure 6.2). The MS shall return the user's response in a FACILITY message containing a return result component. The network shall pass the data received in the response to the application. If the MS is unable to process the request received from the network, it shall return an error indication by sending a FACILITY message containing a return error component.

When the application terminates the dialogue, the network shall clear the transaction by sending a RELEASE COMPLETE message containing a return result component. The MS may also clear the transaction at any time by sending a RELEASE COMPLETE message upon request of the user.

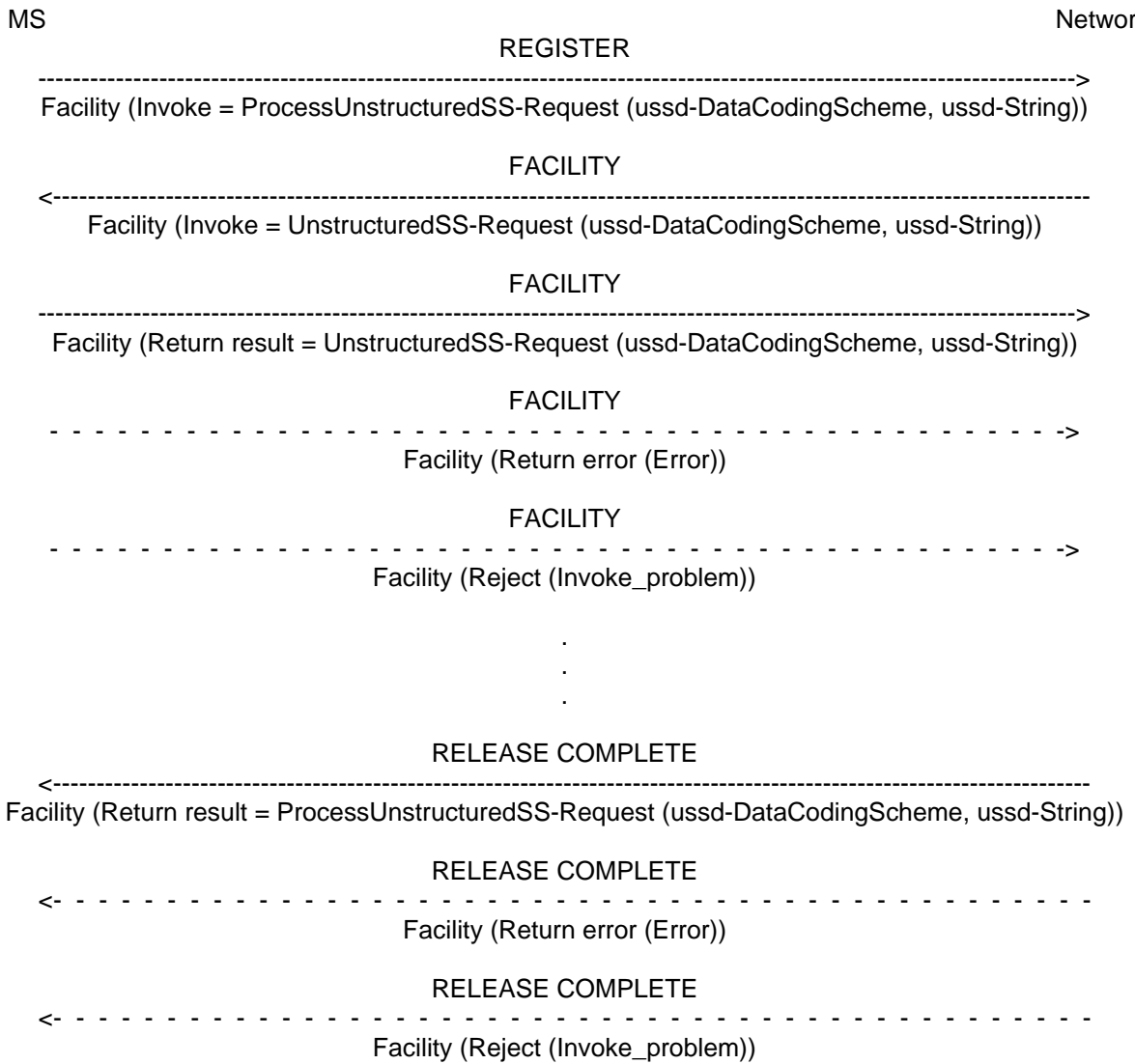
If the network is unable to process the request received from the MS, it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in GSM 04.80.

The MS shall not initiate USSD operations in parallel to any call independent supplementary service transaction. Only one transaction for USSD operations per user is allowed at a time. However, the MS is allowed to initiate USSD operations in parallel to call related transactions.



NOTE: The MS may clear the transaction at any time by sending a RELEASE COMPLETE upon request of the user.

Figure 6.1: Mobile initiated USSD operation, network does not request further information



NOTE 1: The MS may clear the transaction at any time by sending a RELEASE COMPLETE upon request of the user.

NOTE 2: The network may request further information several times. Only one information request is shown. The network initiated USSD operation may also be an USSD notification. Only a network initiated USSD request is shown.

Figure 6.2: Mobile initiated USSD operation, network requests further information

6.2 Cross phase compatibility

6.2.1 Network only supports protocol version 1 of unstructured supplementary service data operations

If a mobile initiated USSD request using protocol version 2 is rejected by the network, and the reason for the rejection is indicated either by the problem code 'unrecognized operation' or a cause 'Facility rejected', the MS shall assume that the network only supports protocol version 1 of USSD operations. The MS shall re-attempt the request by using the appropriate protocol version 1 USSD operation without a SS version indicator if the unstructured data entered by the user can be coded as an IA5 string.

6.2.2 Mobile station only supports protocol version 1 of unstructured supplementary service data operations

A MS supporting only protocol version 1 invokes an USSD request by sending a REGISTER message to the network containing a ProcessUnstructuredSsData invoke component without a SS version indicator. In this situation the network is not allowed to start a network initiated USSD operation. If the application requires such an operation for its proper function, the USSD operation sent by the MS shall be rejected by the application. The network shall terminate the transaction by sending a RELEASE COMPLETE message with cause 'Facility rejected' (see GSM 04.08).

Annex A (informative): Status of GSM 04.90

Status of Technical Specification GSM 04.90		
Date	Version	Remarks
		No phase 1 version
October 1993	version 4.0.0	TS approved by SMG#08
January 1994	version 4.0.1	TS frozen for phase 2 by SMG#09 TS changed to draft prETS 300 572
October 1994	version 4.1.0	CR 04.90-01 (category F) approved by SMG#12 TS changed to final draft prETS 300 572
January 1995	version 4.1.1	TS changed to ETS 300 572 First edition July 1996 file converted from word5 to word6
December 1996	version 5.0.0	GTS converted to draft prETS 300 957 for Release 96
May 1997	version 5.0.1	ETS 300 957 first edition
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History

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