



**NSAI**  
Standards

Standard Recommendation  
S.R. CR 12587:1996

# Medical Informatics - Methodology for the development of healthcare messages

## S.R. CR 12587:1996

*Incorporating amendments/corrigenda issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWIFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces:*

*This document is based on:*  
CR 12587:1996

*Published:*  
23 October, 1996

This document was published under the authority of the NSAI and comes into effect on:  
24 September, 2011

ICS number:  
11.020  
35.240.70

**NSAI**  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E [standards@nsai.ie](mailto:standards@nsai.ie)  
W [NSAI.ie](http://NSAI.ie)

**Sales:**  
T +353 1 857 6730  
F +353 1 857 6729  
W [standards.ie](http://standards.ie)

Údarás um Chaighdeáin Náisiúnta na hÉireann

**REPORT**  
**RAPPORT**  
**BERICHT**

**CR 12587**

October 1996

Octobre 1996

Oktober 1996

---

**English version**

Medical Informatics - Methodology for the  
development of healthcare messages

Méthodologie pour le  
développement des messages dans  
le domaine de la santé

Methodik für den Entwurf von  
Nachrichten (Inhalte, Strukturen) im  
Gesundheitswesen

This CEN REPORT has been prepared by Technical Committee CEN/TC 251 "Medical informatics" and has been approved by CEN on 1996-10-23.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Rue de Stassart 36, B - 1050 Brussels

---

**TABLE OF CONTENTS**

<b>Foreword</b>	<b>5</b>
<b>Introduction</b>	<b>6</b>
<b>1. Scope</b>	<b>8</b>
<b>2. References</b>	<b>9</b>
<b>3. Definitions &amp; Acronyms</b>	<b>10</b>
3.1. Definitions	10
3.2. Acronyms	11
<b>4. Summary of the overall activities in the context of standard healthcare EDI message development.</b>	<b>12</b>
4.1. The context and purpose of the message development activity.	12
4.2. The overall standard message development process	13
4.2.1. Identify healthcare messaging need	14
4.2.2. The message development approach.	14
4.2.3. Prepare message for implementation	18
4.2.4. Change control.	18
4.2.5. Electronic Data Interchange Agreements.	18
<b>5. Message development activities: detailed description.</b>	<b>20</b>
5.1. Scope specification	21
5.1.1. Introduction	21
5.1.2. What, why	21
5.1.3. Process overview	21
5.1.4. When	22
5.1.5. Specific guidelines	22
5.1.6. Scope Specification: summary.	23
5.1.7. Scope Specification: example.	23
5.2. User requirements and scenarios	25
5.2.1. Introduction	25
5.2.2. What, why	25
5.2.3. Process overview	25
5.2.4. When	26
5.2.5. How to achieve quality	27
5.2.6. User requirements and scenarios: summary	27
5.2.7. Scenarios: example.	27
5.3. Communication roles and supported services	29
5.3.1. Introduction	29
5.3.2. What, why	29
5.3.3. Process overview	29
5.3.4. When	33
5.3.5. Representation	33
5.3.6. Quality requirements	33
5.3.7. Communication roles & supported services: summary	34
5.3.8. Example:	34
5.4. Build Domain Information Model	36
5.4.1. Introduction	36
5.4.2. What, why	36
5.4.3. When	37
5.4.4. Process summary	37
5.4.5. DIM: identify and define classes	38
5.4.6. DIM: identify and define relationships between classes	41
5.4.7. DIM: define attribute layer	46
5.4.8. DIM: identify subjects	50
5.4.9. DIM: list of components	53

5.4.10. DIM: Quality requirements	54
5.4.11. Build domain information model: summary	55
5.4.12. Example	56
5.5. General Message Descriptions	58
5.5.1. Introduction.	58
5.5.2. What, why	58
5.5.3. When	58
5.5.4. Process details	58
5.5.5. GMD: list of components	60
5.5.6. General Message Description: summary	62
5.5.7. Example	62
5.6. Mapping GMDs to hierarchical GMDs.	64
5.6.1. Why hierarchical GMDs are needed.	64
5.6.2. Hierarchical GMD: what.	64
5.6.3. General approach.	64
5.6.4. Representation.	65
5.6.5. Process details.	67
5.6.6. Activity summary	70
5.7. Development of Implementable Message Specifications (IMS)	71
5.7.1. What	71
5.7.2. General requirements (correspondence between GMD and IMS)	71
5.7.3. EDIFACT IMS	71
5.7.4. ASN.1 Implementable Message Specification	78
5.7.5. Example of an EDIFACT IMS specification.	86
<b>Annex A. Framework for Healthcare Communications and Messages</b>	<b>87</b>
A.1. Healthcare EDI applications	87
A.2. Framework model	87
A.2.1. Healthcare EDI Services	88
A.2.2. Information and Communication Technology	89
A.2.3. Organisational aspects	89
A.3. Requirements for Standards for Healthcare Communications and Messages	89
A.3.1. Introduction	89
A.3.2. Categories of standards	90
<b>Annex B. Message development process management issues.</b>	<b>92</b>
B.1. Iteration	92
B.2. Project Management activities	93
B.3. Quality assurance activities	94
B.4. Project organisation	94
B.4.1. Core team	94
B.4.2. Organising an extended team	95
B.4.3. Liaising with advisory / consultative groups	95
<b>Annex C. Attribute data types.</b>	<b>96</b>
C.1. Overview	96
C.2. String	97
C.3. Calendar date	98
C.4. Time of calendar date	98
C.5. Boolean	98
C.6. Integer:	98
C.7. Real	99
C.8. Coded value	99
C.9. Coded value or string	100
C.10. Coded value and string	100
C.11. List of coded values	101
C.12. List of coded values or string	101
C.13. List of coded values and string	102
C.14. Coded value without code meaning	102

CR 12587:1996

C.15. Attribute group	103
C.16. Common attribute group.	103
C.17. Data type assignment decision table.	104
<b>Annex D. Mapping an OO-GMD into a hierarchical GMD:     transformation tools.</b>	<b>105</b>
D.1. Transformation using inference through derivation	105
D.1.1. Introduction	105
D.1.2. Activity details	106
D.1.3. Building the Semantic Graph	108
D.2. Transformation using direct inference	112
D.2.1. Basic Mapping Rules	112
D.2.2. Understanding relations through their constraints	112
D.2.3. Data Structure Mapping in Detail	113
D.2.4. Hierarchical transformation versus hierarchical building	115
D.2.5. Hierarchy and the trees	116
D.2.6. Example	117
<b>Annex E. Moving to implementation.</b>	<b>119</b>
E.1. GMD profiles	119
E.1.1. Introduction	119
E.1.2. What	119
E.1.3. Where used	119
E.1.4. When	119
E.1.5. Who	119
E.1.6. Representation	119
E.1.7. Notes	120
E.1.8. GMD components by message profile	120
E.2. IMS profiles.	120
E.2.1. Development of notations	120
E.2.2. Cardinalities	120
E.2.3. Presence/absence	120
E.2.4. Dependencies	120
E.3. Registration mechanisms for profiles	120
E.3.1. Pre-emptive	121
E.3.2. Historic	121
E.3.3. Registration of combined GMD/IMS profiles.	121
E.4. Communication roles in the context of EDI systems implementation	122
<b>Annex F. Method in the context of tightly coupled systems</b>	<b>123</b>
<b>Annex G. Paradigm annex on how to read the models</b>	<b>124</b>
G.1. Model components	124
Subjects	124
Classes, class-&-objects	124
Types of relationships	124
G.2. Symbols	124
Notes	126
Warnings	126
G.3. Hierarchical GMDs	127
<b>Annex H. Executive Summary</b>	<b>129</b>

**Foreword**

**Method for the development of healthcare messages**

This CEN Report has been prepared under the direction of the European Committee for Standardisation (CEN) and is being submitted for approval by CEN/TC251 "Medical Informatics".

The preparation of this CEN Report was undertaken by CEN/TC 251/PT3-025 and covered by the European Commission under voucher BC/CEN/93/17.12

The members of this project team were :

Sigurd From, Norway  
Raphaël Hacquin, Belgium  
Andrew Hinchley, United Kingdom  
Brian Love, United Kingdom  
Yves Mounier, France  
Dirk Segers, Belgium (project team leader)  
Jorgen Bruun Svendsen, Denmark.

## **Introduction**

The main goal of WG3 is to develop standardised healthcare EDI messages. To ensure the overall consistency and coherence between the various standard messages (to be) developed, it is important that the message development activities conducted in a variety of domains are based upon the same approach and that the resulting deliverables are structured and presented consistently. The goal of this CEN Report is to describe the method to be used for the definition of character-based EDI messages to be used in healthcare, as currently no adequate method exists for this purpose<sup>1</sup>.

The method builds upon and extends the approach as defined and used so far by WG3 (see CR 1350:1993 and the European Prestandard for the messages for exchange of laboratory information), and contains the following main components:

- establishment of the user requirements in the selected healthcare messaging domain.
- both an informal and formal specification of the messaging scenarios. This includes the definition of the communication roles, the messaging services (functions) to be supported by these roles and the major interrelationships between the EDI message types required to cover the needs for a particular domain.
- the formal definition of the information that is shared between the communication roles, through the Domain Information Model.
- the formal definition of the messages required to support the information exchange needs (General Message Descriptions), independently of the EDI-syntax used for the implementation.
- how to translate the General Message Descriptions into hierarchical structure specifications for implementation using a standard EDI-syntax,
- how to develop Implementable Message Specifications using a standard EDI-syntax (e.g. ASN.1 and EDIFACT).

The report specifies the method to be used by CEN/TC 251/WG3 in particular, but the underlying principles may be used by other CEN/TC 251 working groups and even outside the healthcare messaging domain.

The main clauses are clause 4 and 5. Clause 4 is a summary of the overall activities in the context of the development of standard messages, clause 5 defines each activity covered by the scope of this report in detail.

The annexes deal with issues arising related to the approach:

- annex A positions the message development approach in the context of the overall healthcare communications framework and in the overall context of standards,
- annex B describes a number of management issues related to the message development process (iteration, process management, quality assurance activities, project team organisation),
- annex C defines the attribute data types, used for the specification of the messages, in detail.
- annex D gives 2 additional approaches for the transformation of an object-oriented general message description into a hierarchical general message description.
- annex E deals with the aspects when moving to implementation (mainly profiling, i.e. customisation of the message specifications towards local implementation needs).
- annex F clarifies the scope of this method when considered in the context of more tightly coupled systems.
- annex G is a paradigm annex on how to read the models included in messaging standards based upon this approach

---

<sup>1</sup> Most methods are oriented towards the development of systems. This approach aims specifically at the definition of standardised EDI messages, in such a way that these specifications are complete, independent on the underlying implementations (implying a longer life-cycle for the specifications), easy to understand by the end-users and usable towards system developers.



- annex H is an executive summary of the approach.

How to read and use this document:

If you are new to the work of CEN/TC 251/WG3, and if you want to get the essential information about the way the Working Group develops standardised messages: after this introduction:

1. annex A,
2. annex H (executive summary)
3. clause 1 (scope),
4. clause 4 (message development overview).

If you know a little about the approach as used by the Working Group, and if you want to get more familiar with it:

1. annex A,
2. clause 1 (scope),
3. clause 4 (message development overview) or annex F (executive summary)
4. clause 5 (detailed message development activity description) or annex G (summary of symbols).

If you are knowledgeable about the approach and the activities of CEN/TC 251/WG3, and if you want to apply it for a specific message development task:

1. clause 1 (scope),
2. clause 4 (message development overview),
3. clause 5 (detailed message development activity description),
4. annex B (message development process management issues),
5. use annex C for issues arising related to attribute data types,
6. use annex D for the troubleshooting related to the construction of hierarchical GMDs,
7. use annex E for the modification of the resulting message specifications to more local information exchange needs,

If you want to use the deliverables resulting from a message development group which followed the approach:

1. annex H (executive summary),
2. clause 4 (message development overview),
3. clause 5 (detailed message development activity description) or annex G (summary of symbols).

## **1. Scope.**

The scope of this CEN report is to specify a method for the development of European Standard message specifications for the electronic exchange of structured character-based information, between autonomous computer systems within and between organisations, for purposes related to healthcare. Such message standards are essential if healthcare services are to obtain the benefits of open systems and avoid the constraints of proprietary interfaces. The method specifies the activities of the message development process and the structure and the components of the resulting deliverables.

The scope of this report does not include method specifications for the development of other subject areas covered by working groups of CEN/TC 251, EWOS EG-MED and WEEB/MD9.

The scope covers the development process of standardised messages, starting from the user requirements up to the delivery of message specifications using EDIFACT and ASN.1, the two international syntax standards selected in view of CR 1350:1993, but the report does not exclude other syntaxes (e.g. SGML) from being used for the syntax specific message specifications.

The scope of the Report is limited to the specification of standardised messages, therefore it does not include in its scope areas such as conformance testing of messaging applications, the implementation method for messaging standards, the maintenance of the messaging standards. It does not include in its scope issues relating to data secrecy and data protection. It does not specify methods for establishing directories of coding schemes, for data sets or for messages. It does not include specifications related to the messaging standards approval process.

The method defined by this CEN Report supports and is validated for the development of message specifications for the electronic exchange of structured character-based information in healthcare, but it does not by its nature exclude the method to be used in a wider domain (i.e. other types of information or other domains).

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-