



**NSAI**  
Standards

Standard Recommendation  
S.R. CR 1350:1993

# Investigation of Syntaxes for Existing Interchange Formats to be Used in Healthcare

## S.R. CR 1350:1993

*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 1350:1993

*Published:*  
30 September, 1993

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

ICS number:  
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

CR 1350:1993

RAPPORT

BERICHT

September 1993

---

**English version**

**Investigation of syntaxes  
for existing interchange formats  
to be used in healthcare**

This CEN REPORT has been established by the CEN/TC 251 "Medical informatics" and has been approved by CEN on 1993-07-01.

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

|   |    |
|---|----|
| FOREWORD .....  | 1  |
| PART I: METHOD, INVESTIGATION, CONCLUSIONS AND<br>RECOMMENDATIONS ..... | 3  |
| 1. INTRODUCTION .....   | 5  |
| 1.1. Scope .....  | 5  |
| 1.1.1. Original Scope .....   | 5  |
| 1.1.2. Reduced Scope .....  | 5  |
| 1.2. Definitions and Acronyms .....                                     | 6  |
| 1.2.1. Definitions .....  | 6  |
| 1.2.2. Acronyms .....   | 7  |
| 2. INTERWORKING BETWEEN HEALTH CARE APPLICATIONS .....                  | 9  |
| 2.1. Message Development Method .....                                   | 10 |
| 2.1.1. Scope of the Problem Domain .....                                | 10 |
| 2.1.2. Communication Parties and Communication Roles .....              | 10 |
| 2.1.3. Scenarios .....  | 11 |
| 2.1.4. Services .....   | 11 |
| 2.1.5. Domain Information Model (DIM) .....                             | 11 |
| 2.1.6. General Message Descriptions (GMDs) .....                        | 12 |
| 2.2. Mapping to Interchange Format Dependent Message Descriptions ..... | 13 |
| 3. FUNCTIONAL REQUIREMENTS FOR INTERCHANGE FORMATS .....                | 15 |
| 3.1. Support of Information Structures .....                            | 15 |
| 3.2. Support of Datatypes .....   | 15 |
| 3.3. Encoding .....   | 15 |
| 3.4. Evolution and Backwards Compatibility .....                        | 16 |
| 3.5. Conformance and Certification .....                                | 16 |
| 3.6. Support and Availability .....                                     | 16 |
| 4. INVESTIGATION METHOD .....   | 19 |

|        |  |    |
|--------|--|----|
| 5.     | EVALUATION CRITERIA .....                            | 21 |
| 5.1.   | Scope of Evaluation Criteria .....                   | 21 |
| 5.2.   | Domain Dependencies .....                            | 21 |
| 5.3.   | Classified Evaluation Results .....                  | 22 |
| 5.4.   | Excluded Evaluation Criteria .....                   | 22 |
| 5.5.   | Description of the Evaluation Criteria .....         | 23 |
| 5.5.1. | Supported Information Structures .....               | 23 |
| 5.5.2. | Support of Datatypes.....                            | 26 |
| 5.5.3. | Encoding.....  | 30 |
| 5.5.4. | Evolution and Backwards Compatibility .....          | 31 |
| 5.5.5. | Conformance .....                                    | 31 |
| 5.5.6. | Support and Availability .....                       | 32 |
| 6.     | SELECTED INTERCHANGE FORMATS .....                   | 35 |
| 6.1.   | Description of Evaluated Interchange Formats .....   | 37 |
| 6.1.1. | ASN.1 .....  | 37 |
| 6.1.2. | ASTM E1238/HL 7 .....                                | 37 |
| 6.1.3. | EDIFACT .....  | 38 |
| 6.1.4. | EUCLIDES.....  | 38 |
| 6.1.5. | ODA .....  | 38 |
| 7.     | EVALUATION RESULTS AND DISCUSSION .....              | 41 |
| 7.1.   | Supported Information Structures .....               | 41 |
| 7.2.   | Supported Data Types.....                            | 42 |
| 7.3.   | Encoding.....  | 43 |
| 7.4.   | Evolution and Backwards Compatibility .....          | 43 |
| 7.5.   | Conformance .....                                    | 44 |
| 7.6.   | Support and Availability .....                       | 44 |
| 8.     | SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....       | 45 |
| 8.1.   | Overview of Investigation Process .....              | 45 |
| 8.2.   | Assessment of IFs .....                              | 45 |
| 8.3.   | Development of IFDMDs.....                           | 46 |
| 8.4.   | The Need for Mapping Rules from GMDs to IFDMDs ..... | 47 |
| 8.5.   | Limitations of Evaluated IFs.....                    | 47 |

|  |           |
|--|-----------|
| <b>PART II: EXAMPLES AND SUPPLEMENTARY INFORMATION .....</b>                   | <b>49</b> |
| 9. <b>EXAMPLE A - LABORATORY COMMUNICATION .....</b>                           | <b>51</b> |
| 9.1. Scope of the Problem Domain .....   | 51        |
| 9.2. Communication Roles.....  | 51        |
| 9.3. Scenarios .....   | 51        |
| 9.3.1. Scenario I - GP to Laboratory, GP Collects Specimens.....               | 51        |
| 9.3.2. Scenario II - Clinical Department to Laboratory in Same Hospital.....   | 52        |
| 9.4. Services .....  | 53        |
| 9.5. Domain Information Model (DIM) .....                                      | 54        |
| 9.5.1. Specification of Attributes .....                                       | 57        |
| 9.5.2. Specification of Operations.....  | 59        |
| 9.6. General Message Descriptions (GMDs) .....                                 | 60        |
| 9.6.1. GMD for Lab Request in Scenario I.....                                  | 61        |
| 9.6.2. GMD for Lab Request in Scenario II .....                                | 61        |
| 9.7. Functional Requirements for Interchange Format .....                      | 63        |
| 10. <b>EXAMPLE B - INTERNAL MEDICINE TRANSFER FOLDER .....</b>                 | <b>65</b> |
| 10.1. Scope of Problem Domain .....  | 65        |
| 10.2. Communication Roles.....   | 65        |
| 10.3. Scenarios .....  | 65        |
| 10.3.1. Scenario I - Internal Medicine Unit sends Folder to Cardiologist ..... | 65        |
| 10.4. Services .....   | 66        |
| 10.5. Domain Information Model .....   | 67        |
| 10.5.1. Specification of Attributes .....                                      | 68        |
| 10.6. General Message Descriptions (GMDs) .....                                | 71        |
| 10.7 Functional Requirements for Interchange Format.....                       | 72        |
| 11. <b>ASN.1 .....</b>   | <b>73</b> |
| 11.1. Mapping to Interchange Format Dependent Message Descriptions.....        | 73        |
| 11.2. Evaluation Results .....   | 76        |
| 11.2.1. Supported Information structures.....                                  | 76        |
| 11.2.2. Supported Datatypes .....  | 77        |
| 11.2.3. Encoding .....   | 77        |
| 11.2.4. Evolution and Backwards Compatibility .....                            | 78        |
| 11.2.5. Conformance .....  | 78        |
| 11.2.6. Support and Availability .....   | 79        |

|         |   |     |
|---------|---|-----|
| 12.     | ASTM.....   | 81  |
| 12.1.   | Mapping to Interchange Format Dependent Message Descriptions..... | 81  |
| 12.1.1. | Mapping scheme.....   | 81  |
| 12.2.   | Evaluation Results.....   | 85  |
| 12.2.1. | Supported Information Structures.....                             | 86  |
| 12.2.2. | Supported Datatypes.....  | 86  |
| 12.2.3. | Encoding.....   | 87  |
| 12.2.4. | Evolution and Backwards Compatibility.....                        | 87  |
| 12.2.5. | Conformance.....  | 87  |
| 12.2.6. | Support and Availability.....                                     | 88  |
| 13.     | EDIFACT.....  | 89  |
| 13.1.   | A General Mapping Method for EDIFACT.....                         | 89  |
| 13.1.1. | How Mapping Could be Done.....                                    | 89  |
| 13.2.   | Mapping to Interchange Format Dependent Message Descriptions..... | 91  |
| 13.2.1. | The Objects.....  | 91  |
| 13.2.2. | The Message.....  | 92  |
| 13.3.   | Evaluation Results.....   | 94  |
| 13.3.1. | Supported Information Structures.....                             | 94  |
| 13.3.2. | Supported Datatypes.....  | 95  |
| 13.3.3. | Encoding.....   | 95  |
| 13.3.4. | Evolution and Backwards Compatibility.....                        | 96  |
| 13.3.5. | Conformance.....  | 96  |
| 13.3.6. | Support and Availability.....                                     | 96  |
| 14.     | EUCLIDES.....   | 97  |
| 14.1.   | Mapping to Interchange Format Dependent Message Descriptions..... | 97  |
| 14.1.1. | Mapping from GMD A-1.....   | 97  |
| 14.1.2. | Mapping from GMD A-2.....   | 103 |
| 14.1.3. | Mapping from the Combination of GMD A-1 and GMD A-2.....          | 104 |
| 14.2.   | Evaluation Results.....   | 107 |
| 14.2.1. | Supported Information Structures.....                             | 107 |
| 14.2.2. | Supported Datatypes.....  | 108 |
| 14.2.3. | Encoding.....   | 108 |
| 14.2.4. | Evolution and Backwards Compatibility.....                        | 108 |
| 14.2.5. | Conformance.....  | 109 |
| 14.2.6. | Support and Availability.....                                     | 110 |

|         |   |     |
|---------|---|-----|
| 15.     | ODA.....  | 111 |
| 15.1.   | The ODA standard.....   | 111 |
| 15.2.   | Mapping to Interchange Format Dependent Message Descriptions..... | 111 |
| 15.3.   | Evaluation Results .....  | 116 |
| 15.3.1. | Supported Information Structures .....                            | 116 |
| 15.3.2. | Supported Datatypes.....  | 117 |
| 15.3.3. | Encoding .....  | 117 |
| 15.3.4. | Evolution and Backwards Compatibility .....                       | 118 |
| 15.3.5. | Conformance .....   | 118 |
| 15.3.6. | Support and Availability.....                                     | 118 |
|         | ANNEXES .....   | 119 |
| A.      | TERMS OF REFERENCE .....  | 119 |
| B.      | PROJECT TEAM MEMBERS .....  | 121 |
| C.      | BIBLIOGRAPHY .....  | 123 |
| C.1     | Standard Publications .....                                       | 123 |
| C.2     | Other Publications .....  | 127 |



## Foreword

This technical report was prepared under the direction of the European Committee for Standardization (CEN) and approved by the CEN Technical Committee 251 (TC 251 - Medical Informatics).

A project team, CEN/TC 251/PT004, was established in February 1992 based on mandate BC-IT 211 given by CEN/TC 251 and approved by the CEN/BT. A copy of the terms of reference for the project team is provided in annex A. The project team consisted of 8 members, given annex B.

This technical report has gone through three stages:

First, an Interim Report (INR) was produced and presented for the CEN/TC 251/WG 3 for technical control. Based on the comments received from members of WG 3, the report was updated and a First Working Document (FWD) was produced.

The FWD was submitted to CEN/TC 251 for a three months period of comments. A total of 84 comments were received. Based on these comments, an amendment to the Technical Report was produced and presented to WG3. The amendments, together with the FWD, were accepted by WG3 as a final technical document and forwarded to CEN/TC 251 for approval. CEN/TC 251 approved these documents on 1993-01-26.

This Final Document (FIN) of the Technical Report is an editorial update of the FWD together with the approved amendments. In order to enhance the readability of the report, it has been split into two parts. Part I is the main part and includes the explanation of the method and investigation together with conclusions and recommendations. Part II contains two examples of health care domain analyses and supplementary information about the investigation of each interchange format.

Sigurd From  
Leader of CEN/TC 251/PT 004

Oslo, January 1993

## **PART I: Method, Investigation, Conclusions and Recommendations**

# **1. Introduction**

The objective of this technical report is to investigate syntaxes for existing interchange formats (IFs) to be used in health care and to define a strategy for selecting IFs. This requires the establishment of a framework for interworking between health care applications. Today such a framework does not exist and PT 004 has described a preliminary method for development of messages for information exchange within the health care which will be used in the investigation and the definition of a future strategy.

## **1.1. Scope**

### **1.1.1. Original Scope**

In the terms of reference for PT 004 the scope of the investigation was the whole of the health care area. The number of suggested evaluation criteria was large. In the recommended strategy for the project team it is stated "The interchange formats need to be evaluated against a set of properties. The properties will be selected both from health care and technical requirements including efficiency, richness, complexity, ambiguity, flexibility, cost and practicality".

### **1.1.2. Reduced Scope**

Due to resource constraints, PT 004 has reduced the scope of its work. This has been done in three ways:

1. The domain of health care is reduced to two examples from the laboratory communication domain and the internal medicine domain. This selection is explained in chapter 4.
2. The number and type of evaluation criteria were reduced compared to the suggested properties in the terms of reference. Selection of the evaluation criteria was done based on the established method for message development. A more detailed explanation is given in chapter 5.
3. The number of IFs were reduced from a possible 23 down to 5. The selected formats were ASN.1, ASTM E1238, EDIFACT, EUCLIDES and ODA. This selection is explained in chapter 6.

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
-