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# Machine readable cards - Healthcare applications - Logical data structures and concepts for different card technologies for use by patients in health applications

This CEN Report was approved by CEN on 25 November 2000. It has been drawn up by the Technical Committee CEN/TC 224.

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# Foreword

This document has been prepared by CEN /TC 224, "Machine readable cards, related device interfaces and operations".

This CEN Report is published to provide availability of the work undertaken by CEN/TC 224 during the years 1992-1997 which was aiming to produce a European standard entitled "Machine readable cards – Healthcare applications – Logical data structures and concepts for different card technologies for use by patients in health applications". CEN/TC 224 has decided to close its own work towards completing this standards work being convinced that the work effort should be concentrated and will be better continued in ISO/TC 251 "Health informatics".

The scope of the work presented herein was intended to provide solutions for different types of storage technologies although the focus of interest in Europe has been the possibilities offered by Integrated Circuit Cards. This CEN Report describes an important approach towards providing a solution where, with certain constraints, the same structure of information objects could be provided for different technologies facilitating the integration of card applications with various health related applications using databases and network communication in addition to the information stored on cards.

The work of CEN/TC 224 started in parallel with CEN/TC 251, to a large extent with the same experts. CEN/TC 251 received a mandate from EU and EFTA and developed the ENV 12018 entitled "Medical informatics – Identification, administrative, and common clinical data structure for Intermittently Connected Devices used in healthcare (including machine readable cards)" which was adopted in 1997. This standard is currently undergoing a major revision in preparation for being transferred to a European Standard.

This CEN Report is largely based on ENV 12018 and contains large parts of this standard. The reason for including those initially was that as it had not been finalized, it could not safely be referenced. During the completion of this CEN/TC 224 work a few amendments compared to ENV 12018:1997 were included and provide one of the inputs to the revision of ENV 12018.

This CEN Report is also being presented to ISO/TC 215 and it is expected that the basic ideas and many details will be able to provide the basis for one or very likely several International Standards on this topic.

It is important to understand that the specification provided in this CEN Report although expressed as normative requirements, is not a European Standard.

# Introduction

This CEN report contains details regarding the standardization of logical data storage to be utilised in conjunction with machine readable cards intended for use by patients within health applications.

Data objects have been defined within ENV 12018:1997 that, with respect to fitness of purpose, had similar attributes and thence fitted a common data storage potential such as is encompassed by a dedicated file (DF) as described within a smart card.

This strategy has a number of advantages, the most important being that the "master file" containing the data objects with all their sub components can be transmitted and thence stored as a single super object within media lacking processing capability. However for media with processing capabilities such objects can be subdivided into different logical files as described above and re-assembled on transmission.

Because of the technological limitations of some types of media it is necessary that some data transformation take place when transferring data between some different types of technologies. However, as the interface devices to these technologies are dissimilar the software interface will always be aware of the technology with which it is interfacing and therefore able to perform these transformations. This approach to logical data storage can enable the storage of all types of information theoretically on any type of device and does away with the redundancy produced by the common core approach. In the case of some media (in particular ISO compatible magnetic stripe media) it is expected that the interface will carry out transformation of the data when transferring it between different card technologies (to cope with differential encoding rules and the application of ASN.1 context specific tags).

## 1 Scope

This CEN Report specifies the logical data storage format for data in machine readable cards to be used by patients in health applications.

The data structures and the methodology are described in plain text and ASN.1 notation.

This CEN Report is not applicable to bar coded data on machine readable cards.

## 2 Normative references

This CEN Report incorporates by dated or 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 CEN Report only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1387:1996, *Machine readable cards – Health care applications – Cards : General characteristics.*

EN 1867:1997, *Machine readable cards – Health care applications – Numbering system and registration procedure for issuer identifers.*

EN ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions – Part 1 : Country codes (ISO 3166-1:1997).*

EN ISO/IEC 7811-2:1996, *Identification cards – Recording technique – Part 2 : Magnetic stripe (ISO/IEC 7811-2:1995).*

EN ISO/IEC 7812-1:1995, *Identification cards – Identification of issuers – Part 1 : Numbering system (ISO/IEC 7812-1:1993).*

EN ISO/IEC 7816-4:1996, *Information technology - Identification cards – Integrated circuit(s) cards with contacts – Part 4 : Interindustry commands for interchange (ISO/IEC 7816-4:1995).*

EN ISO/IEC 7816-5:1995, *Identification cards – Integrated circuit(s) cards with contacts – Part 5 : Numbering system and registration procedure for application identifiers (ISO/IEC 7816-5:1994).*

EN ISO/IEC 7816-6:1997, *Identification cards – Integrated circuit(s) cards with contacts – Part 6 : Interindustry data elements (ISO/IEC 7816-6:1996).*

ENV 12018:1997, *Identification, administrative, and common clinical data structure for Intermittently Connected Devices used in healthcare (including machine readable cards).*

ISO 639:1988, *Code for the representation of names of languages.*

ISO 639-2:1998, *Code for the representation of names of languages – Part 2 : Alpha-3 code.*

ISO 7498-2:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 2 : Security Architecture.*

ISO/IEC 7816 (all parts), *Identification cards – Integrated circuit(s) cards with contacts.*

ISO/IEC 8824 (all parts), *Information technology – Abstract Syntax Notation One (ASN.1).*

ISO/IEC 8825 (all parts), *Information technology – ASN.1 encoding rules.*

ISO/IEC 10118-2:1994, *Information technology – Security techniques – Hash-functions – Part 2 : Hash-functions using an n-bit block cipher algorithm.*