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**Information technology — Guidelines for  
the organization and representation of data  
elements for data interchange — Coding  
methods and principles**

*Technologies de l'information — Principes directeurs pour l'organisation  
et la représentation des éléments de données pour l'échange de  
données — Méthodes et principes de codage*

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization.

National Bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC/JTC 1.

The main task of technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility for an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard; ("state of the art", for example).

Technical reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transferred into International Standard. Technical reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 9789, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology* Subcommittee 14, *Data element principles*.

## **Introduction**

This Technical Report is a guide to develop and implement coded representations.

Coding covers the way and the form in which data are expressed.

The increased use of data processing and electronic data interchange heavily relies on accurate, reliable, controllable and verifiable data recorded in data bases.

In formal communication and storage data are expressed in symbols (usually digits or letters), arithmetic numbers and descriptions, which should have a fixed stable meaning for every one involved and thereby be suitable for purposes of processing and communication.

This Technical Report presents the objectives of coding, the characteristics, advantages and disadvantages of different coding methods, a survey of the features of codes and guidelines for the design of codes.

# Information technology -- Guidelines for the organization and representation of data elements for data interchange -- Coding methods and principles

## 1 Scope

This Technical Report provides general guidance on the manner on which data can be expressed by codes.

It describes the objectives of coding, the characteristics, advantages and disadvantages of different coding methods, the features of codes and gives guidelines for the design of codes.

This Technical Report is not directed toward any specific application area nor dependent on any design method for application systems or data interchange.

## 2 References

### 2.1 General references

ISO/IEC 646:1991, *Information technology -- ISO 7-bit coded character set for information interchange.*

ISO 2382-4:1987, *Information processing systems - Vocabulary - Part 04: Organization of data.*

ISO 2375:1985, *Data processing - Procedure for registration of escape sequences.*

ISO 7064:1983, *Data processing - Check character systems.*

ISO/IEC 11179-3:1994, *Information technology - Specification and standardization of data elements - Part 3: Basic attributes of data elements.*

### 2.2 Examples of applications of this Technical Report

ISO 9735:1988, *Electronic data interchange for administration, commerce and transport (EDIFACT) - Application level syntax.*

ISO 8601:1988, *Data elements and interchange formats - Information interchange - Representation of dates and times.*

ISO 3166:1993, *Codes for the representation of names of countries.*