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Information technology — Keyboard layouts for alphanumeric inputs — Description of ISO/IEC 9995 issues regarding users' needs and necessary innovations

Technologies de l'information — Dispositions de clavier pour la saisie alphanumérique — Description de problèmes liés à l'ISO/CEI 9995 concernant les besoins utilisateur et des innovations nécessaires

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, the joint 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 of an agreement on an International Standard;

— type 3, when the joint 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 transformed into International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TR 24784, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

Introduction

In today's information age, computer systems are found in all areas of business and private life.

They simplify locating electronic information, allow exchange of electronic data and help to increase efficiency in business. The man-machine interface enables dialogue to be conducted between the user and the computer system. Particularly for the keyboard input of alphanumeric data, a common, standardized interface is desirable to minimize the need for users to adjust to different layouts when using different information and communication technology systems.

In order to allow more flexibility for innovation, this Technical Report, in line with ISO/IEC TR 15440 on future keyboards, describes the issues raised over the years about the implementation of ISO/IEC 9995, and proposes changes that should be considered in the ISO/IEC 9995 series. The goals of this Technical Report are

— for ISO/IEC 9995 to apply to all alphanumeric and numeric keyboards across the widest spectrum of applications and environments;

— to simplify the zone and section model;

— to suggest simplified requirements with less complexity for developers and users, test laboratories, and purchasers.

This Technical Report complements ISO 9241-4 by addressing issues such as:

— repositioning sections and zones (e.g. numeric-/editing) to support a more natural posture when shifting between keys and a mouse;

— broadening the applicability of ISO/IEC 9995 for keyboards in mobile IT equipment (PDAs, smart phones, etc.).

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Information technology — Keyboard layouts for alphanumeric inputs — Description of ISO/IEC 9995 issues regarding users' needs and necessary innovations

1 Scope

This Technical Report specifies possible modifications of ISO/IEC 9995-1 to ISO/IEC 9995-8 to fulfil the changed market needs and the requirements for keyboard layouts and allocation of keycap imprints (including letters, numerals, symbols, and other markings on the keycaps) for alphanumeric and numeric input devices for all types of information and communication technology devices and systems including:

— personal computers, workstations, computer terminals, visual display terminals (VDTs);

— electronic typewriters and other machines with alphanumeric and numeric keyboards;

— mobile computer systems and multimedia devices with hardware or virtual keyboards;

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— electronic document scanners and multifunction devices incorporating alphanumeric and/or numeric keyboards;

— calculators, telephones and automated teller machines having alphanumeric and/or numeric keypads/keyboards.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 9995 (all parts), *Information technology — Keyboard layouts for text and office systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 9995-1:2006 apply.

4 ISO/IEC 9995-1 — "General principles governing keyboard layouts"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006.

4.1 Part 1 — "Introduction"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006 — Introduction.

4.1.1 Modification Arguments

The text in the introduction section needs to be renewed because it is desired to apply ISO/IEC 9995 not only to office machines, but to apply to all alphanumeric and numeric keyboards across the widest spectrum of today's and upcoming applications and usage of alphanumeric and numeric keyboards. In addition, the standard needs to accommodate the main areas of a keyboard in order to provide freedom for innovation.

4.1.2 New text proposed for "Introduction"

ISO/IEC 9995 defines a framework for the layout of all alphanumeric and numeric keyboards across the widest spectrum of today's and upcoming applications and usage of alphanumeric and numeric keyboards. The functions to be performed by keyboards are grouped into three categories that correspond to the main physical sections of the keyboard. Application of ISO/IEC 9995 in the design of keyboards will provide the user with a unified, predictable man-machine interface by dividing the keyboard into functional areas and sections and allocating functions to keys. One of the major tasks of a universal-usage keyboard is to accommodate the larger sets of characters required by the various applications for which keyboards are used today.

4.2 Part 1, clause 1 — "Scope"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006, Clause 1 — Scope.

4.2.1 Modification arguments

In today's information age, computer systems are found in all areas of business and private life. They simplify locating electronic information, allow exchange of electronic data and help to increase efficiency in business. The man-machine interface enables dialogue to be conducted between the user and the computer system. Particularly for the keyboard input of alphanumeric data, a common, standardized interface is desirable to minimize the need for users to adjust to different layouts when using different information and communication technology systems.

4.2.2 New text proposed for "Scope"

ISO/IEC 9995 specifies the requirements for keyboard layouts and allocation of keycap imprints (including letters, numerals, symbols, and other markings on the keycaps) for alphanumeric and numeric input devices for all types of information and communication technology devices and systems including:

— personal computers, workstations, computer terminals, visual display terminals (VDT's);

— electronic typewriters and other machines with alphanumeric and numeric keyboards;

— mobile computer systems including UMPCs, PDAs etc. and multimedia devices with hardware keyboards (e.g. linear keyboards, foldable keyboards) or virtual keyboards (e.g. touchscreens, projection keyboards);

— electronic document scanners and multifunction devices incorporating alphanumeric and/or numeric keyboards;

— calculators, telephones and automated teller machines having alphanumeric and/or numeric keypads/keyboards.

4.3 Part 1, clause 5.2 — "Physical division of keyboard into sections and zones"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006, clause 5.2 — Physical division of keyboards into sections and zones.

4.3.1 Modification arguments

ISO/IEC 9995-1:2006 defines four sections with multiple zones:

— alphanumeric section, zones ZAO ZA4 (5 zones);

— editing section, zones ZEO ZE2 (4 zones);

— function section, zones ZFO ZF4 (5 zones);

— numeric section, zones ZNO ZN6 (7 zones).

This is quite complex. In today's market we see more and more innovative keyboard solutions that ignore those allocations, and indeed, there is <u>no reason to have such amount of zones</u>. A second issue appears because the editing and function keys overlap in both sections and it is not always clear what editing/what function is. To simplify the standard, the editing section and the function section should be merged together and the number of zones should thus be reduced.

4.3.2 New text proposed for "Physical division of keyboard into sections and zones"

This subclause introduces the concept of sections and zones. The various functions that can be performed by a keyboard are grouped into three categories, arranged in three keyboard sections as follows:

— alphanumeric section: ZA0 alphanumeric zone, ZA1 and ZA2 function zones (see Figure 1);

— numeric section: numeric zone ZN0 and function zone ZN1 (see Figure 2);

— editing-/function section: cursor key zone ZEF0, editing-/function zone ZEF1 (see Figure 3).
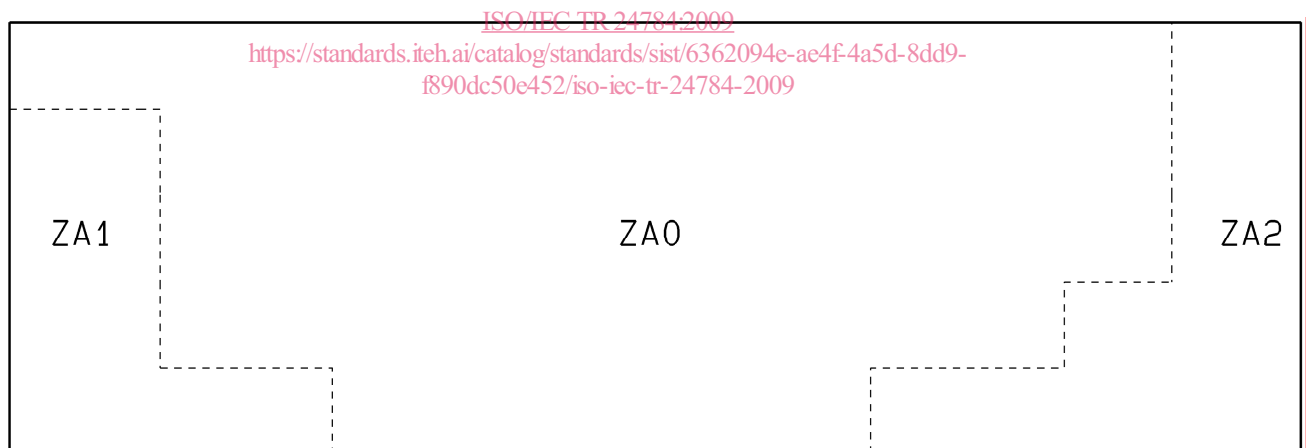

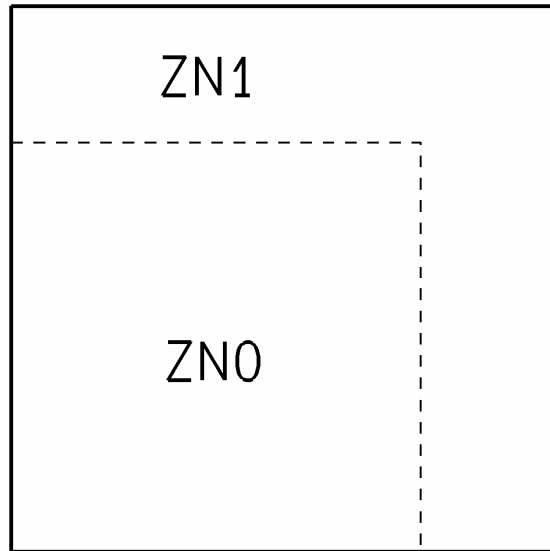**Figure 1 — Layout of zones — Alphanumeric section**

Figure 2 — Layout of zones — Numeric section

Figure 3 — Layout of zones — Editing-/function section

4.4 Part 1, clause 6.1 — "Placement of sections"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006, clause 6.1 — Placement of sections.

4.4.1 Modification arguments

ISO/IEC 9995-1:2006 specifies the editing section and the function section. Except the cursor keys, the arrangement of the editing keys has changed and the editing and function keys overlap in both sections. A definition problem come up, what is editing/what is function?

4.4.2 Adaptation of "Placement of sections"

The goal is to merge the editing section and the function section together (see also clause 8 editing section and clause 9 function section of this Technical Report).

## 4.5 Part 1, clause 7 — "Key position numbering system"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006, clause 7 — Key position numbering system.

4.5.1 Modification arguments

Simplifying the standard leads to a common section for editing/function keys. (see 4.4.1 and 4.4.2) Therefore an adjustment of the key position numbering system is necessary.

4.5.2 New text proposed for "Key position numbering system"

Grids are specified for <u>three</u> separate sections: <u>alphanumeric</u> section, <u>editing-/function section</u> (see Figure 4), and <u>numeric</u> section.
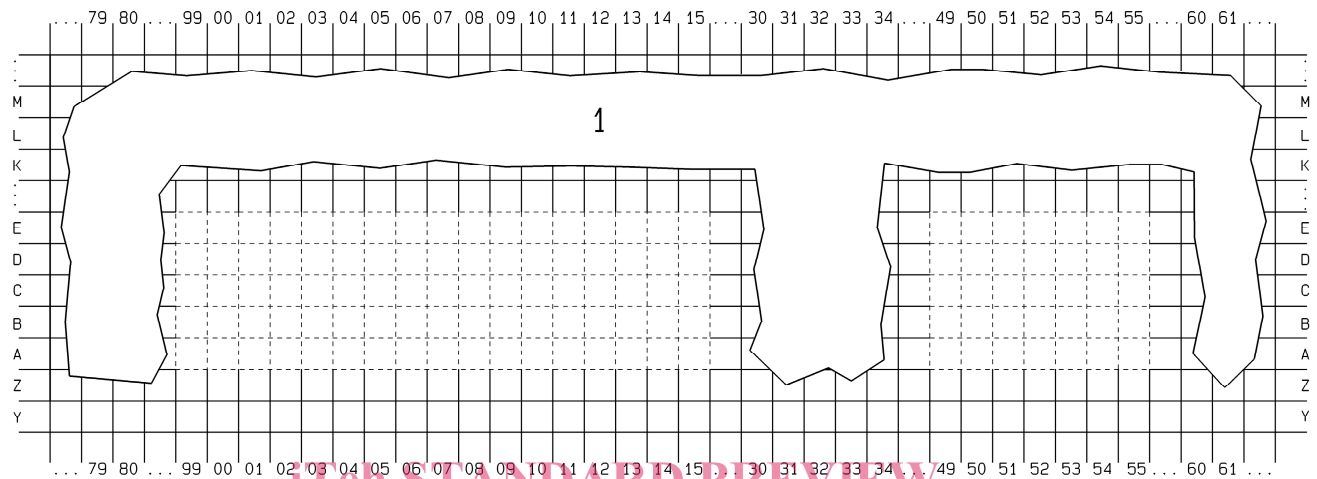
Key

1   editing/function section

Figure 4 — Editing-/function section

The reference rows and the relevant reference columns are defined as follows:

⎯   Row A is the row containing the space bar in the alphanumeric section.

⎯   Row K is the first row of editing- or function keys above the alphanumeric section.

⎯   Column 01 is the column containing the key with the digit one in the alphanumeric section.

⎯   Column 30 is the first column of editing- or function keys on the right side beyond the alphanumeric section.

⎯   Column 51 is the column containing the key with the digit one in the numeric section.

⎯   Column 60 is the first column of editing- or function keys on the right side beyond the numeric section.

⎯   Column 80 is the first column of editing- or function keys on the left side beyond the alphanumeric section.

4.6   Part 1, clause 8.1 — "Group positions"

This clause lists the proposed modifications of ISO/IEC 9995-1:2006, clause 8.1 — Group positions