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Information technology — Guidelines, methodology and reference criteria for cultural and linguistic adaptability in information technology products

Technologies de l'information — Lignes directrices, méthodologie et critères de référence pour l'adaptabilité culturelle et linguistique dans les produits des technologies de l'information

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Foreword

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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 Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.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 19764, 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*.

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Introduction

A successful information technology product or service requires satisfying the needs of users, including needs of a cultural and linguistic nature, which some people consider an essential part of what is now known as "[user]" accessibility [to information technology].

This Technical Report (TR) will assist the marketplace by providing an objective evaluation method to measure cultural and linguistic adaptability. Although local or national requirements of a legal and regulatory nature may not always be directly relevant in evaluation of products meeting cultural and linguistic adaptability, they sometimes constitute a world-wide challenge for many products or services, now including those which are IT-based. The TR provides indications reminding that such requirements may have to be met in a national or local profile to complete cultural and linguistic requirements in some countries and hence should be considered in evaluation, as guidance to producers.

The TR is considered as a tool for examining products and thus is intended to help consumers in evaluating the ability of a product to support a given language and culture. At the same time it is also intended to help developers evaluating in advance or enhancing their product's capabilities with regards to cultural and linguistic adaptability.

It is expected that with the use of such a method, typically no product will be assigned a null mark, and typically none will also be able to achieve perfection, so that cultural and linguistic adaptability will be progressively defined in this way by the market and that it will constitute a moving – and evolving – target by nature. It is indeed more a tool to assist in the improvement of products.

The TR is presented in such a way that one individual or organization should be able to make its own benchmark in a sequential way by following the guidelines given, and establish the weightings attributed to each point evaluated in accordance with all parties involved in such an evaluation. As stated before, the goal is not to discard products but to help correct their weaknesses.

The TR is based on actual experience gathered initially at OQLF (*Office québécois de la langue française*) over four years in evaluating software (mainly) and hardware (mainly in the field of user interfaces, such as keyboards from different manufacturers, using profiles of standards and other specifications), with regards to meeting the different requirements of the French language and the cultural aspects relevant in Québec. This model project, nicknamed BETEL (*Banc d'essai technolinguistique*), experienced through a specific natural language and a specific cultural environment is being generalized here to cater for needs of any language in a similar way. The steps given in the TR constitute guidelines and criteria that could be enhanced over years. Hence this TR, which currently has modest but pragmatic goals in its evaluation, could also be updated in the future in line with comments received over months and years from the communities of its users.

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Information technology — Guidelines, methodology and reference criteria for cultural and linguistic adaptability in information technology products

1 Scope

This Technical Report (TR) defines a methodology and a guided check-list for evaluation of cultural adaptability in software, hardware and other information technology (IT) products. The check-list and guidelines are not only applicable to all IT products, but also can be expanded to meet the requirements of specific cultural environments.

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 14651:2001, *Information technology — International string ordering and comparison — Method for comparing character strings and description of the common template tailorable ordering*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
cultural and linguistic adaptability
CLA
ability for a product, while keeping its portability and interoperability properties, to

— be internationalized, that is be adapted to the special characteristics of natural languages and the commonly accepted rules for their use, or of cultures in a given geographic region;

— take into account the usual needs of any category of users, with the exclusion of needs related to physical constraints

3.2
culture
set of uses, customs, and artistic, religious and intellectual expressions which are characteristic features of a group or a human society

4 Benchmark (Guidelines and criteria for evaluating CLA)

The following constitutes a sequential path to follow in order to establish a CLA evaluation benchmark. This is to be seen as a general *aide-mémoire* from which one can deviate by suppressing non-applicable elements or by adding relevant ones. In particular, software and hardware can use some common elements but in general

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CLA characteristics of hardware (such as keyboards) are simpler to evaluate, if only the number of CLA elements to be considered is taken into consideration.

Once all the elements to be taken into consideration have been established, and before testing, relative weighting of each element occurs, against which evaluation will be determined before attributing a general score to a product, which may also permit product ranking.

4.1 Product identification and environment data for the evaluation report

In the evaluation report, the product is identified by a series of data items, given in 4.1.1 to 4.1.8.

4.1.1 Producer name, address and other coordinates

If copies of a software product to be evaluated can be downloaded through the Internet, the URL of the site where this can be done is documented here.

4.1.2 Product name, language(s) and version

The identification of the exact version evaluated is documented here (including the specific indication of the language[s] version if the core product was not produced in a linguistically neutral way), as accurately as possible. The evaluation can indeed be very different after an evaluation is fed back to the producer, which is likely to correct some, if not all, weaknesses identified in previous versions.

4.1.3 Product category

A summary of the general scope of the product evaluated and its main functions is given here.

4.1.4 Evaluation date

The evaluation date complements the version number. Some products are provided with fixed in between versions that may affect the validity of the results if this element is not well identified. It is highly recommended that all fixes available from the producer at the date of evaluation be applied to guarantee the accuracy of the report in a standardized way.

4.1.5 Evaluation team

This is essential historical data which could give an idea of the expertise of the evaluation team and of its credibility over a period of time. A minimum of four independent observers should provide their evaluations. The two extreme evaluations for each evaluated item should be discarded and the average evaluation of the remaining evaluations should be kept.

4.1.6 Test environment

This data documents the environment under which the tests were made, such as the actual keyboard used, the specific fonts used if relevant, the operating system and its version, the character set(s) used and so on.

4.1.7 Method used for acquiring the product

Here it may be relevant to say who sponsored the acquisition of the product, to make transparent the links that the evaluators may have with the producer. If the product was provided free of charge, it is important that no advantage was given to the evaluators.

4.1.8 Remarks on evaluation conditions

This gives some more data on issues or remarks that the evaluators could make on the conditions of the evaluation tests.

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4.2 General cultural and linguistic profile of the product

This profile constitutes the first approach that a user may have in front of a new product. This approach also has relevant CLA requirements that are evaluated here under three different themes.

4.2.1 Packaging and product presentation in general

One can get a product fully packaged or in the case of software, optionally through downloading via a web site. In both cases the presentation may or may not respect the user language and culture. This element evaluates this first contact with a product. It is recommended that the evaluation report shows an image of either the physical packaging or of a screen capture from a web site, to illustrate the evaluation.

4.2.2 Install

Even if the final installed product may fully take into account the user language and culture, it is possible that the install process does not or does more or less. This element is intended to evaluate this characteristic. Again, in the report, pictures should document the evaluation as far as possible. Not only should the documentation respect the user language but so should the elements of the installation process, including for example installation file names or directory names whenever it is intended that they be significant for the installer (for example, a file called "README" or "ThisFileShouldBeDeleted" in English might be uninformative to a human installer whose language is not English). When file names can be determined by the user they should ideally allow the user to enter all national characters necessary to write a text.

Conflicts between the product installed and its environment should be identified (for example, installing a French piece of software on an English operating system or the reverse might have an adverse effect. When the install process gives such indications, they should be noted. Otherwise, the presence of inconsistencies in the user interface (for example, error messages not corresponding to the user language) should be assessed.

4.2.3 General elements to be evaluated

To quickly see if a product provides a general respect of the user language and culture the following elements should be examined: online help, dialog boxes, help captions, error messages, file names, and elements of after-sale service.

4.3 Local language and culture support

After the first approach to a product, this is the most important aspect of evaluation, as it undergoes detailed evaluation. Whenever international standards or national standards exist they should be considered for evaluation. In their absence, in certain areas additional private specifications may be of help.

Otherwise natural language support per se should be considered, which in general concerns input, process and output supporting the cultural and linguistic characteristics of the user.

4.3.1 Input method

The product evaluated should allow without interference the user language in all its richness. Normally one evaluates here the ability of the product to cope with international and national keyboard layout (for example ISO/IEC 9995), international or national entry method (for example ISO/IEC 14755) and to properly feed back the characters entered. Points should be given for each standard involved, as in general several may be involved.

4.3.2 Input (read)

The product evaluated should be able to read and correctly display a file that already contains the characters used in the user language. Either the identification of the language is explicit (tagging system identifying the character set, or in its absence it should be possible to identify it manually) or it is implicit (the product assumes that a given character set is used). Unless the coded character set used is the universal character

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set (ISO/IEC 10646), it is not desirable that the character set in use be assumed as being fixed, as this seriously affects the linguistic adaptability of the product.

Support of various international and national standards for coding is to be evaluated. Pure support of private specifications is not desirable in any product as it ultimately affects interoperability of products.

4.3.3 Output (write)

The product should be able to correctly display and transmit the characters of the user language and culture consistently so that the information transported preserves its meaning (for example, a EURO sign input using a specific character set should be printed as a EURO sign and nothing else).

4.3.4 Printing

The product used should also be able to consistently print the characters input by the keyboard and input method or the characters read from an already existing file, produced either by the product itself or by another product (interoperability).

4.3.5 Searching

The reproduction of characters from input to output is something that is of a less complex nature than their adequate processing. Searching must respect the characteristics of the user language expectation: for example, in French one may search using accented or unaccented keywords and the comparison should be made according to the behaviour expected from state-of-the-art-aware international and adaptable comparison methods (such as the one prescribed by ISO/IEC 14651).

4.3.6 Character properties: how well taken into account in processing

Character properties such as equivalence or non-equivalence between upper and lower case characters in alphabetic scripts are to be evaluated here according to user expectations or accepted or conventional constraints. Any discrepancy with linguistic and cultural practices of the evaluated context should be noted in the report and weighed accordingly if this discrepancy is dependent on the product itself.

4.3.7 Sorting

Sorting is a process that is linked to character comparison, like the searching process, with the difference that it is more global in its scope and presentation. Whenever sorting is involved in a product, if such a sorting is under the control of the product itself, results produced should respect the cultural and linguistic user expectation. The process should respect either a national sort standard practice (such as the order expected in dictionaries for a given language and country or region) or be aligned with ISO/IEC 14651, which itself requires adaptation to the user language and culture.

A sorting benchmark should be established (such as the one that exists in Canadian standard CAN/CSA Z243.4.1) and the product tested against this benchmark.

Any lack of conformity with the sort expectations expressed in a technical specification (such as a delta conformant to ISO/IEC 14651) should be documented by a screen capture or the image of a computer printout.

4.3.8 Special word processing

Any rules that exist governing word-wrapping between lines, or special word or character processing required by the culture or language of the user are evaluated here.

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4.3.9 Openness

The openness of a software or hardware is its capability to deal with external elements – such as software plugins, hardware connections of different natures, interchange of characters with other applications (while keeping their "meaning"), exchange of multilingual text, exchange of metadata – without affecting functionality and performance of the product.

Data and metadata should be compatible in a cross-language way, characters in cross-platform, cross-language exchanges, etc.

When metadata is involved, for example, the exchange should be possible with culturally neutral elements (Do not impose on a user metadatain a given natural language that might not be the user's own language.) Numeric metadata is therefore preferable for inter-machine or inter-application exchanges; for example, whenever universal character set metadata is exchanged, neutral, numeric identification of the character is preferable to character names; and presentation of this metadata should otherwise be presented to the user with names of characters in the user's language.

4.4 Linguistic quality in general

For the evaluated product, take a sample of a given percentage (10 % is a reasonable sample if the total text fits in less than 500 pages, 5 % is sufficient for more than 500 pages) of all text involved in user documentation, messages, and display. Within this sample, linguistic quality should be evaluated in terms of terminology, spelling and grammar mistakes.

4.5 Artistic qualities (if applicable)

4.5.1 Cultural colour bias

Here any cultural bias of a product relative to the culture of the user is to be identified. For example, a colour may be considered a symbol of pain or death in a given culture, but a symbol of life, purity and joy in another. Products may have been developed in total ignorance of these biases. It is in the producer's interest that such issues be thoroughly identified.

4.5.2 Symbolism

Beyond colours, all elements of a symbolic nature that adversely affect user acceptability should be documented in the report.

4.5.3 Layout

Some cultures pay more attention to elements presented in a specific way than in others (example text with bold titles, with special indents or put in a box, or simply using particular fonts, may be more significant in one culture than in another). Respect of word or character wrapping rules may be evaluated here if they are considered as an artistic element.

4.5.4 Miscellaneous artistic cultural requirements

In many cultures artistic presentation in a given way is significant. Support of such requirements is to be applied here whenever applicable.

4.6 Legal considerations

Although the goal of this TR is not to solve legal problems, any issue, perceived or obvious, relative to laws, local rules and by-laws, should be identified in the evaluation report. As any score in this area is of a particularly sensitive nature, classification should be restricted to aspects which are very obvious and undebatable in nature.

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