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1.0 INTRODUCTORY NOTES

1.1 Interworking of JTC1 Business Team on Electronic Commerce and JTC1 Cultural Adaptability Workshop

JTC1 activities of its Business Team on Electronic Commerce (BT-EC) and the Cultural Adaptability Workshop (CAW) both completed their work and reported to the 12th Plenary Meeting of ISO/IEC JTC1, 2-5 June, 1998 in Sendai, Japan. JTC1 document N5448 contains the resolutions of this Plenary. In Resolution 8 (N5448), JTC1 instructs its secretariat to circulate the BT-EC Report (JTC1 N5296) to "National Bodies" and all JTC1 Technical Directions for review and comment. Resolutions 8, 9 and 10 pertain to JTC1 follow-up on the BT-EC Report and recommendations. Resolution 22 pertains to JTC1 follow-up on CAW and its recommendations.

Members of the BT-EC participated in CAW. The BT-EC scheduled its final meeting to be held after the Cultural Adaptability Workshop so that the BT-EC could benefit from the results of CAW. This Canadian contribution benefits from this interworking between participants in both BT-EC and CAW.

1.2 Electronic Commerce and Cultural/Linguistic Adaptability

Cultural and linguistic aspects of electronic commerce were a priority consideration in the wider context of the work of the BT-EC. Key factors which led to this priority consideration include:

- decision of the BT-EC to focus on the "individual to business" component of electronic commerce;
- active participation of consumer representatives;
- identification of "user interfaces" as a major area for new standardization work;
- the Internet; and,
- identification of four horizontal issues as key impediments to widespread use of electronic commerce.

In the sections which follow, each of these factors is summarized.

1.2.1 The BT-EC Way of Working: Focus on "Individual to Business"

The BT-EC Report to JTC1 {See ISO/IEC JTC1 N5296} recognized that there were serious time and resource constraints with respect to the multiple issues to be addressed. These constraints required it to focus on the "individual to business" component of electronic commerce. The rationale for this decision by the BT-EC is provided in Section 3 of the BT-EC Report and we quote:

> *"EC has many different facets - technical, economical, political, fiscal, social, societal, cultural - of which only the technical is considered explicitly in this report. The other facets are addressed implicitly, (e.g., when discussing consumer requirements for EC).*
>
> *Given the resources available in the Team, the time to deliver its report and the huge complexity of the subject matter, the need arose for BT-EC to limit its scope pragmatically and to focus on a*

few topic areas. It is therefore important to point out that the findings in this report cannot be considered comprehensive. Rather, they are an attempt to provide additional insight into the broad area of Electronic Commerce.

Electronic Commerce can be broadly categorized into the following scenarios:

- *Business to business,*
- *Business to public administration,*
- *Individual to business,*
- *Individual to public administration,*
- *Public administration to public administration,*

with the understanding that each scenario holds in both directions.

Due to time constraints, BT-EC chose, at its kick-off meeting, to focus its work on "Individual to business", at the same time recognizing that some of its findings are more broadly applicable. Electronic Commerce involving individuals (i.e. of the scenarios individual-to-business or to-administration) is unique in many respects: As a fundamental component, it brings human beings into play, with:

- *their requirements (see clause 5.2.2. for a full discussion) for:*
    - *adequate man-machine interfaces,*
    - *privacy and data protection,*
    - *other societal aspects;*
- *the need to provide for different payment schemes, depending on the value of the goods traded;*
- *equal emphasis on aspects of interoperability between systems and on trust in the new technology;*
- *predominance of objects perceivable by humans rather than by computers (see also 6.2).*

However, BT-EC also recognizes that Individual-to-Business Electronic Commerce cannot be studied in isolation as it links into the Business-to-Business category through merchant systems interconnected e.g., with financial institutions or transportation business."

1.2.2 Active participation of consumer representatives in the work of the BT-EC

Consumer representatives played a prominent and active role in the work of the BT-EC and also presented many contributions. From their perspective there are consumer issues which need to be addressed irrespective of whether the use of information technologies is in support of commercial activities or in support of non-commercial activities such as public administration.

1.2.3 User Interfaces

The BT-EC concluded its work by identifying three areas of standards development work urgently needed

to support electronic commerce. They are:

(a) user interfaces
(b) basic functions; and,
(c) definitions and encoding of data and other objects.

{See further Sections 7.3 through 7.4 in the BT-EC Report, JTC1 N5296}

Here the BT-EC noted that user interface requirements would benefit from incorporating localization and multilingual requirements from standards development work on "(c) definition and encoding of data and other objects".

1.2.4 The Internet

The BT-EC recognized that a prime reason for the high profile of electronic commerce from both public and private sector perspectives was the emergence of Internet-based use of information technologies and the explosive growth of its use by individuals. Electronic data interchange (EDI) and related standards development work focused primarily on structured data interchanges among "business to business" and "business to public administration". The explosive growth and use of the Internet in the past few years requires an equally radical evaluation of existing standardization work to ensure relevancy to paradigm shifts such as those caused by the Internet.

1.2.5 Horizontal Issues and Cultural/Linguistic Adaptability

In the BT-EC Report, cultural and linguistic adaptability were deemed to be important to electronic commerce. In addition to being noted as part of consumer requirements {Section 5.2}, they were identified by the BT-EC as key components of the four horizontal issues which are of general relevance for all scenarios involving Electronic Commerce. These issues are:

- information technology (IT)-enablement;
- localization including multilingualism;
- cross-sectorial aspects; and,
- cultural adaptability.

The BT-EC ordered these horizontal issues on the basis of:

(1) the need to go from the simpler to more complex challenges;
(2) placing priority on the "do-able" and immediately most useful in the context of increasing resource constraints in standardization work; and,
(3) promotion and visibility of ISO/IEC JTC1 work within the ISO, IEC and ITU and especially outside of these standardization communities.

From a user perspective, these four horizontal issues need to be addressed in a harmonized manner.

From an Electronic Commerce perspective, i.e., that of the JTC1/BT-EC perspective, standardization work addressing the first three horizontal issues associated with:

- "IT-enablement";
- "Localization and Multilingualism"; and,

- "Cross-Sectorial" aspects,

should resolve many of the requirements for cultural adaptability. It then remains to be seen what other "cultural adaptability" requirements remain, i.e., in addition to those already identified as "cultural elements" and/or those of a societal nature.

Canada therefore supports the approach of the JTC1 BT-EC to standards development work and requests that JTC1 Ad-Hoc on Cultural/Linguistic Adaptability to take a similar position.

1.3 Localization and Multilingualism - Linkage to French National Body Contribution (JTC1 N5611)

This Canadian contribution which builds on the results of the work of the JTC1 BT-EC also addresses concerns raised in the French National Body Contribution JTC1 N5611 titled "Elements of Reflection on cultural and linguistic adaptability of products and standards in the field of Information and Communication Technologies".

The real world examples provided in Chapter 4 below address the fact:

- that local use of a particular natural language may well result in multiple different linguistic expressions, i.e., names, for the same real world object;

- that a single character string or word (or set of character strings or words) in a natural language may as a "term" well have multiple different meanings, in the same natural language let alone a whole set of other meanings in "special" languages. {See further JTC1 BT-EC N046}

2.0 BASIS OF CANADIAN APPROACH ON THE NEED TO INCORPORATE CULTURAL/LINGUISTIC ADAPTABILITY IN ALL ISO/IEC AS WELL AS ISO STANDARDIZATION WORK

2.1 "THE CANADIAN ELECTRONIC COMMERCE STRATEGY"[1]

The "Canadian Electronic Commerce Strategy" represents a consensus strategy for the Canadian economy and society as represented by the public sector, i.e., federal and provincial levels of government, the private sector, i.e., as represented through industry sector associations, major companies, organizations representing small and medium sized enterprises, as well as organizations representing the public-at-large, i.e., organizations representing consumers, human rights advocates, etc. This document presents a vision for Canada's future in electronic commerce and how it can be achieved. {See further for English language version <<http:e-com.ic.gc.ca>>; and for the French language version

[1] Canada. Industry Canada. The Canadian Electronic Commerce Strategy. Ottawa: Industry Canada, 1998, 42 p. Also available on the Web at <http://e-com.ic.gc>.

Canada. Industrie Canada. Stratégie Canadienne sur le commerce électronique. Ottawa: Industrie Canada, 1998, 46 p. Également offerte par voie électronique sur le World Wide Web à <http://com-e.ic.gc>

The ISBN for both the English and French versions is 0-662-63815-8.; and the (Canadian Government) Catalogue No. is C2-367/1998 for both as this publication is produced as a single document. This publication is also available from Industry Canada's Distribution Services, Communications Branch, Room 205D, West Tower, 235 Queen St. Ottawa, K1A 0H5. Tel: (613) 947-7466; Fax: (613) 954-6436.

see, <<http://com-e.ic.gc.ca>>}

The "Canadian Electronic Commerce Strategy" identifies four major concerns of business and consumers alike. They are:

- Building trust in the digital economy;
- Clarifying marketplace rules
- Strengthening the information infrastructure; and,
- Realizing the opportunities.

With respect to the Canadian priority on "Strengthening the information infrastructure", Canada notes one of the sections under this priority, i.e., the one numbered/titled "3.2 Open Networking/Standards":

- explicitly identifies and recognizes the importance of the work of ISO/IEC JTC1;

- notes that four key impediments to the deployment of electronic commerce globally have been identified and are (in English and French):

English	French
*"**Information technology enablement:** the need to transform currently existing business standards from manual to electronic form.*[2]	*"**Habilitation des technologies de l'information:** La nécessité de transformer des normes commerciales actuelles pour les faire passer d'une forme manuelle à une forme électronique.*
***Localization and multilingualism:** the need to identify objects in an unambiguous, linguistically neutral way that can be processed electronically.*	***Localisation et multilinguisme:** La nécessité d'identifier des objets d'une manière non ambiguë, neutre sur le plan linguistique et qui permette un traitement électronique.*
***Sector-to-sector impediments:** the need to create common understanding between different industry sectors and disciplines that assign their own use and meaning to terms.*	***Obstacles intersectoriels:** L nécessité d'un sens commun entre des disciplines et des secteurs industriels différents qui attribuent aux terms leur propre signification et les utilisent à leur façon.*
***Cultural adaptability:** the need to address cultural differences, such as business practices and interpretations of consumer rights".*	***Adaptabilité culturelle:** La nécessité de concilier des cultures différentes, notamment en matière de pratiques commerciales et d'interprétations de droits des consommateurs.*
{page 35 of the published hard copy English version of "The Canadian Electronic Commerce Strategy"}	{page 37 of the French published hard copy "Stratégie canadienne sur le Commerce électornique"}

2.2 SUPPORT OF RESULTS OF OECD MINISTERIAL ON ELECTRONIC COMMERCE

[2] It is understood "electronic form" does not mean electronic equivalents of present hard-copy forms and associated manual processes. Rather "IT-enablement" introduces a requirement for standards that are prepared, structured and made available for unambiguous usage within and among information systems. This requirement can be expressed as "computational integrity", defined by the BT-EC as:

"the expression of standards in a form that ensures precise description of behaviour and semantics in a manner that allows for automated processing to occur, and the managed evolution of such standards in a way that enables dynamic introduction by the next generation of information systems".

On 7-9 October, 1998, OECD Ministers, observers from non-OECD countries, heads of key international organizations, business leaders as Chairs or CEOs of global enterprises, representatives of labour, consumer and societal interests met in Ottawa to articulate their plans to promote the development of electronic commerce. This OECD Ministerial Conference, hosted by the Government of Canada, represented an important step in ongoing efforts in the ongoing efforts in the evolution towards realizing a global electronic commerce agenda. A key result of this OECD Ministerial Conference was a "shared vision for global electronic commerce". The Canadian position here supports the OECD Conference conclusions titled "OECD Conference A Borderless World: Realizing the Potential of Global Electronic Commerce Conference Conclusion" (Reference: <<http://www.ottawaoecdconference.org/english/homepage.html>>) and we quote from page 3 of the hard copy English language version:

> *"Electronic commerce is by definition global. Whether the action is domestic or regional, private or public sector - all electronic commerce policies and activities will have limited impact unless they facilitate a global approach. In convening the conference in Ottawa, OECD governments recognized the importance of collaboration among governments, and with business, labour and consumers in the development and use of electronic commerce, and the need for co-operative approaches to its application across sectors and national borders. To this end, OECD Ministers, the Business and Industry Advisory Committee to the OECD (BIAC), the Trade Union Advisory Committee to the OECD (TUAC), and other private sector participants concluded that:*
>
> - *electronic commerce offers a radically new way of conducting commercial transactions, and is potentially a key engine to increase economic growth, and enhance development around the world;*
> - *co-operation amongst all players (governments, consumers, business, labour, and public institutions). as well as social dialogue, must be encouraged in policy making to facilitate the development of global electronic commerce in all countries and international fora, and that their actions should strive to be internationally compatible whenever possible;*
> - *governments should promote a pro-competitive environment to allow electronic commerce to flourish, work to reduce and eliminate unnecessary barriers to trade, and act where necessary to ensure adequate protection of key public interest objectives in the digital world just as they do in the physical world;*
> - *government intervention, when required, should be proportionate, transparent, consistent and predictable, as well as technologically neutral;*
> - *governments should recognize the importance of continued co-operation among business in standards setting, and in enhancing interoperability, within an international, voluntary and consensus-based environment;*
> - *business should continue to play a key role in developing and implementing solutions to a number of the issues essential for the development of electronic commerce, recognizing and taking into account fundamental public interests, economic and social goals, and working closely with governments and other players."*

In addition, the OECD Ministerial Conference on Electronic Commerce resulted in a "A shared Vision for

global electronic commerce," the four key components as policy issues. They are:

(1) Building trust for users and consumers;

(2) Establishing ground rules for the digital marketplace;

(3) Enhancing the information infrastructure for electronic commerce;

(4) Maximizing the benefits.

The conference delegates urged the OECD in its ongoing work and Action Plan to report regularly to the global community on the progress made nationally and internationally in making electronic commerce a reality by addressing the policy issues implicit in the four conference themes noted above.

Canada supports the results of the OECD Ministerial on electronic commerce and in the context of standardization work particularly that of "enhancing the information infrastructure" and removing the four key impediments identified, i.e., IT-enablement, localization and multiculturalism, sector-to-sector impediments and cultural adaptability.

2.3 SUPPORT THE FINDINGS OF THE JTC1 BUSINESS TEAM ON ELECTRONIC COMMERCE (BT-EC)

Canada 's approach to the Ad-Hoc on the Technical Direction and Cultural Linguistic is that the Ad-Hoc should support the results of the work of the JTC1 Business Team on Electronic Commerce. With respect to Ad-Hoc on the Technical Direction on Cultural and Linguistic Adaptability, Canada supports and wishes to draw attention to the findings of the work of the JTC1/BT-EC, i.e., cultural and linguistic adaptability as elements of the four horizontal issues identified by the BT-EC.

In the contribution, Canada has attached as Annex A the text of the BT-EC Report on "Horizontal Issues".

In addition, Canada has undertaken additional and more detailed work on the "Examples of Encodable Value Domains" found in Clause 12.3 of the BT-EC Report (pages 61-66). The results are presented in Section 4.0 below.

The purpose of these examples is, wherever possible and feasible, to demonstrate the need to make/push cultural and linguistic adaptability aspects to the human interface as distinguished from the underlying common/global computer-to-computer interfaces.

2.4 SUPPORT THE FINDINGS OF THE ISO, IEC AND ITU SPONSORED "GLOBAL STANDARDS CONFERENCE" (GSC)

2.4.1 INTRODUCTION

On 1-3 October, 1997 a Global Standards Conference (GSC) was held in Brussels. Its theme was "Building the Global Information Society for the 21st Century: New Applications and Business Opportunities - Coherent Standards and Regulations". Sponsored by the ISO, IEC, and ITU and hosted by the European Commission, the "GSC/GIS" Conference brought together senior executives from Fortune 500+ companies as well as SMEs, senior public sector officials, consumer representatives and

real do-ers/implementers. As an industry led initiative, the core of the GSC/GIS consisted of four (4) themes and parallel workshops; namely:

(1) Electronic Commerce
(2) Services to the Public
(3) Individual Use
(4) Communications Infrastructure Interoperability.

The focus, topics and results of each of these Workshops as well as the results of each Workshop as well as the those of the Conference as a whole are summarized in a post conference summary proceedings document. This Summary Report, as well as papers and supporting materials presented at the GSC/GIS, can be accessed at <<http://www.ispo.cec.be/standards/conf97>>.

2.4.2 FINDINGS AND RESULTS OF THE FOUR SUB-THEMES PARTICULARLY RELEVANT TO THE JTC1 AD-HOC ON CULTURAL AND LINGUISTIC ADAPTABILITY

[Note: The text which follows are direct quotes from the final reports of the GSC Conference. For the complete text of each of the summary reports see:
<<http://www.ispo.cec.be/standards/conf97/reports.html>>
Page references are to the hard copy version].

2.4.2.1 **Theme #1 - Electronic Commerce**

Electronic commerce must be self-regulated and sector-driven. The global nature of electronic commerce precludes its evolution based on a single business model and requires that it evolves to become a truly multilingual marketplace. (p.9)

Interoperability, as opposed to a single standardized solution, will create the conditions for the successful development of electronic commerce. The various means of achieving interoperability do not matter as long as they bring into being the all-encompassing concept of global electronic commerce. The standardization process must be limited to ensuring seamless interfacing, leaving the actual implementation of user applications to industry; otherwise, creativity in developing solutions and enhancing offerings may be stifled. (p.10)

Electronic commerce requires a degree of harmonization of national legal and regulatory frameworks in order to allow cross-border transactions. In this effort, emphasis should be placed on resolving problems, as opposed to creating a new framework. (p.11)

2.4.2.2 **Theme #2 - Services to the Public**

A recurrent theme underlined the discussions of Workshop 2 on the role of the GIS in providing quality public services. By definition, the GII (Global Information Infrastructure) is global. However, there is no standards architecture that respects the globe's linguistic and cultural diversity in terms of both social and business attitudes. (p.13)

The fastest and most efficient way to set the right standards in a timely fashion is to strike a balance between the genuine requirements of users and the capability of industry to satisfy them. A major technology implication from the point of view of end-users is the challenge to render

increasingly complex applications user-friendly. There is an obvious need to disguise the technology behind applications, lest their user-unfriendliness discourage individuals from fully embracing the GIS. (p.15)

2.4.2.3 **Theme #3 - Individual Use**

Theme #3 focused on the impact of the GIS on the individual user in the domestic or remote environment. More specifically, participants examined how the various facets of the GIS may improve the quality of life, in terms of improved access to useful information across all segments of society, greater mobility due to varied and far-reaching communications links, and an increased involvement of potential content providers in the creation of the GIS, particularly in the process of setting standards. (p.17)

One set of concerns is related to how new technologies, by demonstrating an awareness of user needs in design, can help the individual better cope with the proliferation of choices in the complex, fast-paced life style of the 21st century. New technologies can achieve this by:

- *supporting individual use and personal configuration;*
- *meeting ever-higher consumer expectations (simplicity, affordability, high quality, convenience and ease of use);*
- *ensuring wide accessibility (multilingual support, access by the disabled and aged, access by the economically disadvantaged).* (p.20)

2.4.3.4 **Theme #4 - Communications Infrastructure Interoperability**

Standards for seamless interoperability are essential to the development of new markets and to gaining the trust of consumers, manufacturers and service-providers. (p.21)

The interoperability of heterogeneous networks will be achieved through the development of a framework of interfaces and reference models. Part of this effort will be to identify which types of standard interfaces will be part of the GII. This task is already underway in most of the standards bodies. The interfaces framework should encompass all existing and future network technologies, whether public or private, and should account for levels and patterns of traffic. (p.22)

2.4.3 MAIN RESULTS AND KEY ISSUES OF THE GSC

From an electronic commerce, cultural/linguistic adaptability and standardization perspective, the following statements (as extracted from the "Main Results and Key Issues" part of the final GSC Report) are of interest.

As stressed in most of the workshop reports, it is the conviction of the conference participants that standards must focus on interfacing, as opposed to implementation, as the best means of arriving at globally harmonized solutions for the interoperability of Information and Communications Technology (ICT) products and services. In effect, the Global Information Infrastructure will be a federation of heterogeneous networks operating via standardized interfaces for the interconnection of networks and which allow applications to be run across them with seamless interoperability. On this issue, it is crucial to take into account a concern raised by several participants in Workshop 2 (Services to the Public): the cost to the end-user of such interoperability. (p.28)

As discussed in the workshops, the expansion of open, multilingual standards could significantly increase the volume and value of the world-wide use of the GIS. These standards could act as a catalyst to user- and industry-led innovations that better serve the globe's rich and diverse cultures. *(p.28)*

In order to empower users and consumers, standards should be adaptable to cultural and linguistic needs on national and regional levels, while ensuring full transparency on available market solutions to the consumer. It is important to minimize the risk of their elaboration becoming unclear to users and customers as a result of the proliferation of standardization bodies. *(p.30)*

3.0 CANADIAN RECOMMENDATIONS TO THE JTC1 AD-HOC MEETING OF THE TECHNICAL DIRECTION ON CULTURAL AND LINGUISTIC ADAPTABILITY

3.1 CONTEXT AND BASIS FOR RECOMMENDATIONS

The Canadian recommendations which follow:

- take into account the French member body contributions to this Ad-Hoc dated 19 November, 1998 and numbered as JTC1 N5608, N5609, and N5611.
- support the Canadian Electronic Commerce Strategy as well as conclusions of the OECD Ministerial Conference on Electronic Commerce (Ottawa, 7-9 October, 1998);
- support the conclusions of the ISO, IEC, and ITU sponsored and ECC hosted "Global Standards Conference"; and,
- support findings of the BT-EC Report and its recommendations. [Note: Canada is preparing a separate response on the BT-EC Report as requested by JTC1]

3.2 CANADIAN RECOMMENDATIONS

3.2.1 NEED TO DISTINGUISH BETWEEN "CULTURAL ADAPTABILITY" AS A JTC1 STRATEGIC DIRECTION AND "CULTURAL AND LINGUISTIC ADAPTABILITY" AS A TECHNICAL DIRECTION

Canada notes that "cultural adaptability" is a new strategic direction to be taken into consideration in all standardization work of JTC1 SCs and their WGs, RGs, etc., i.e., in addition to those of "portability" and "interoperability".

Canada also notes that JTC1/SC1 - Vocabulary already uses unique, unambiguous and linguistically neutral identifiers for all its terms and associated definitions.

Canada also notes that JTC1/SC32/WG1 (SC32 = Data Management and Interchange, WG1 = Open-edi) has resolved that all its present and future work on the components of the Business Operational View (BOV) as part of the required standards development work in support of the Open-edi Reference Model

(ISO/IEC 14662) must also support "cultural adaptability". Consequently, SC32/WG1 in progressing its work has decided that any BOV component must have unique linguistically neutral and unambiguous identifiers. Here Canada notes that the proposed FCD 11179-1 "Data Element Standardization" of SC342/WG2 - Metadata, of the term/definition "3.3.33 "identifier" also has the requirements for language independency, uniqueness and unambiguity.

Canada also notes that:

(1) the definition for "cultural adaptability" resulting from the JTC1 sponsored Cultural Adaptability Workshop (CA) held in Ottawa, January 1998 (as found in JTC1 N4627) is the same as that for "cultural elements" found in JTC1/CAW/N008;

(2) Resolution 3 of JTC1/CAW states "that CAW did not have time to address the request of JTC1 to elaborate or amend the definition of "cultural adaptability" as contained in the document JTC1 N4627";

(3) the JTC1/BT-EC Report (Section 6.5) had a similar observation. {See below "A.5 Cultural Adaptability"}

Recommendation 1:

Canada recommends that as part of, or following, the Ad-Hoc on the Technical Direction on Cultural and Linguistic Adaptability:

(1) JTC1 form an Ad-Hoc on the (new) Strategic Direction of "Cultural Adaptability". The purpose of this Ad-Hoc is:

    (a) to develop a definition of "cultural adaptability" as a JTC1 Strategic Direction and associated requirements;

    (b) to develop a set of guidelines to assist JTC1/SCs (and others), (e.g., ISO TCs), in incorporating these "cultural adaptability" requirements in all international standardization work.

(2) that this JTC1 Ad-Hoc on the Strategic Direction of "Cultural Adaptability" work via electronic means;

(3) Canada commits to:

    (a) providing the resource support of experts to complete this work by summer 1999;

    (b) providing an Internet-based facility via the Standards Council of Canada to support working through electronic means;

(4) Canada is willing to provide an "editor" or "facilitator" to support this work.

3.2.2 SUPPORT THE RESULTS OF THE WORK OF THE JTC1 BUSINESS TEAM ON ELECTRONIC COMMERCE AND BUILD ON THEM

Canada considers the results of the work of the JTC1 Business Team on Electronic Commerce (BT-EC) and its findings as presented in the BT-EC Report to be particularly relevant to the JTC1 Ad-Hoc on Cultural and Linguistic Adaptability.

Recommendation 2:

Canada recommends that the JTC1 Ad-Hoc on Cultural and Linguistic Adaptability:

adopt the approach to resolving Horizontal Issues as identified by the BT-EC, i.e.,

- information technology (IT)-enablement,
- localization including multilingualism,
- cross-sectorial aspects,
- cultural adaptability.

These horizontal issues are ordered here on the basis of

1. the need to go from the simpler to more complex challenges,
2. placing priority on the "do-able" and immediately most useful in the context of increasing resource constraints in standardization work; and,
3. promotion and visibility of ISO/IEC JTC1 work within the ISO, IEC and ITU and especially outside of these standardization communities.

Recommendation 3:

Canada recommends that the JTC1 Ad-Hoc on Cultural and Linguistic Adaptability:

adopt the following terms/definitions of the BT-EC Report as part of a draft/working common basis for understanding cultural and linguistic adaptability related standardization issues; namely:

localization: *pertaining to or concerned with anything that is not global and is bound through specified sets of parameters of:*

(a) a linguistic nature including natural and special languages and associated multilingual requirements;
(b) jurisdictional nature, i.e., legal, regulatory, geopolitical, etc.;
(c) a sectorial nature, i.e., industry sector, scientific, professional, etc.;
(d) a human rights nature, i.e., privacy, disabled/handicapped persons, etc.; and/or
(e) consumer behaviour requirements.

Within and among "locales", interoperability and harmonization objectives also apply.

"jurisdiction: *a distinct legal and regulatory framework which places constraints on the global marketplace and in doing so often defines/establishes a local market".*

multilingualism: *"the ability to support not only character sets specific to a language (or family of languages) and associated rules but also localization requirements, i.e., use of a language from jurisdictional, sectorial and consumer marketplace perspectives".*

3.2.3 FOCUS ON CULTURAL AND LINGUISTIC ADAPTABILITY AS A HUMAN INTERFACE ISSUE AS DISTINGUISHED FROM COMPUTER-TO-COMPUTER INTERFACE

Canada supports the findings of the Global Standards Conference (GSC) and the JTC1 Business Team on Electronic Commerce (BT-EC) that cultural and linguistic adaptability is in essence a human interface issue (electronic or hard-copy printouts).

Recommendation 4:

Canada recommends that the JTC1 Ad-Hoc on Cultural and Linguistic Adaptability resolve and/or recommend to JTC1 a resolution (or series or resolutions) stating the following:

(1) the JTC1 Ad-Hoc resolves that:

(a) standardization work is required to support cultural and linguistic needs of (end) users of information technology-based applications;

(b) cultural and linguistic needs (of end-users) are primarily a human-interface issue;

(c) with respect to interworking among information systems, i.e., the computer-to-computer interface, JTC1 should ensure that when and wherever possible standards support the development and utilization of unique, unambiguous and linguistically neutral identifiers for the identification and referencing of "objects" (as well as data elements, processes, etc.), in all ISO/IEC JTC1 standards (and in ISO standards).

4.0 REAL WORLD EXAMPLES OF PRAGMATIC APPROACH TO RESOLVING CULTURAL/LINGUISTIC ADAPTABILITY ISSUES

4.1 INTRODUCTION

1. Chapter 4 is based on an earlier Canadian contribution to JTC1, i.e., N5394 which was updated in JTC1/SC32 N0147. This contribution provides additional and more detailed information in support of Clause 12.3 of the BT-EC Report titled "Examples of Encodable Value Domains" (BT-EC Report, pages 61-66). The Canadian contribution also provided three exhibits in support of the four examples.

2. The four examples are currency codes, country codes, language codes, and commodity codes. These four real world examples were developed to provide a focus for the BT-EC work on four horizontal issues. The four examples have proved useful in Canada in illustrating and explaining the horizontal issues in a simple and non-technical manner to the business community, policy makers, and various industry sectors.

   The exhibits provided are intended to demonstrate that the identification and referencing of real world objects, i.e., as "instances" of an object class in an "encodable value domain" can be done in a linguistically neutral and unambiguous manner.

   This supports a global approach to Electronic Commerce which is capable of meeting localization

and associated multilingual requirements. **Linguistically neutral identification and referencing of objects will also support computational integrity and more efficient data interchange, with higher quality assurance and at lower costs for all participants.**

3. Those interested in standardization in areas pertaining to Electronic Commerce as well as cultural/linguistic adaptability may find these exhibits useful in illustrating the horizontal aspects. They can also use them and augment them by adding their own country and language equivalent(s) terms for the linguistically neutral code(s) in the exhibits.

   The contributions from BT-EC members with respect to their localization and accompanying linguistic requirements as found in the three exhibits is appreciated.

4. It is useful to draw attention of the JTC1 Ad-Hoc on Cultural and Linguistic Adaptability to the BT-EC Report (in Clause 6 on pages 21 and 22) which states:

   > *"Human beings like to name "objects". But the approach of using "names" is not very IT friendly, cost-efficient or time-efficient.*
   >
   > *Depending on the interplay of multilingual and localization requirements, in Electronic Commerce, a singular product or service being offered for sale will have multiple names and differing names even in the "same" language. Thus, if we wish to ensure rapid and widespread use of Electronic Commerce globally, we must on the one hand identify "objects", i.e., products or services being offered for sale, in an unambiguous, linguistically neutral, and IT-processable and EC-facilitated manner, and, on the other hand, present the same via a range of linguistic names (and associated character sets) from a point-of-sale perspective, i.e., human-readable user interface, as required by the "local" marketplace."*

   In support of this BT-EC text, Canada draws attention to ISO 1087 which defines:

   > *"**name:** designation of an object by a linguistic expression".*

   Consequently, any "object" will have (1) multiple names; and, (2) in global Electronic Commerce, many of the "names" used to designate the "object" being traded will be in the form of linguistic expressions which use non-Latin 1 Characters, (e.g., Arabic, Chinese, Thai, Hebrew, Japanese, etc.). This is one reason why ISO/IEC 10646 (a.k.a. "Unicode") will be a key IT infrastructure standard needed to support global electronic commerce, i.e., it provides the tool required to generate cultural/linguistic adaptable equivalencies required at the human interface level of the unambiguous linguistically neutral identifiers used for the computer-to-computer interface(s).

4.2 EXAMPLE #1 — CURRENCY CODES

A key attribute of electronic commerce is that it involves business transaction where payment must be made in a mutually acceptable currency. ISO 4217 is the standard for codes representing currencies and funds. This standard and its contents are the responsibility of ISO TC 68 Banking. The principles for inclusion in the code lists of ISO 4217 is that (1) they must be/represent currencies and funds used within the entities described by ISO 3166 (Country Codes); and, (2) the codes listed are intended to reflect current status, at the date of publication.

ISO 4217 has a number of features and anomalies which although human understandable need to be identified and explicitly captured in an IT-enabled manner. In short, ISO 4217 includes objects which are not currencies (or funds). In ISO 4217, there are countries, i.e., as ISO 3166 entities, where:

- the three digit country code is not the same as the three digit ISO 4217 3-digit code, (e.g., due to the creation/utilization in ISO 4217 of ISO 3166 "User Extensions"). For example, one can readily identify in ISO 4217 twenty-five (25) instances for ISO 3166 entries where the ISO 3166 Country Codes 3-digit numeric differs from the ISO 4217 "Code Name" 3-digit numeric. Nor is there any relation between the ISO 3166 and ISO 4217 alpha codes for many countries.

- a country (or dependency) has no currency of its own and utilizes the currency of another country;

- a country has more than one currency, i.e., its own and that of another country;

- countries having both a currency code and a funds code;

- a set of countries collectively sharing and using a currency which has no "issuing country", (e.g., SDR, XDR, XOF, and XAF). Here one notes the need to add the "euro" as currency (in addition to the "ecu", i.e., XEU);

- special fund types;

- "currency" not linked to any country or organization, (e.g., precious metals such as gold - 959, alpha = XAU, special settlement currencies, etc.); and,

- "currencies" having no numeric code but only a 3-alpha code, (e.g., XFO = Gold Franc).

Some of the above noted rules and relationships are stated in ISO 4217, others are implicit (and known by "experts"). An IT-enabled version of ISO 4217 is required especially now that in electronic commerce, and particularly that which is Internet-based. Many suppliers and consumers entering the electronic commerce market or other Internet-based activities are not aware of the "peculiarities" of ISO 4217, particularly those outside the financial community.

Experiences in the financial services/banking sector indicate that on the Internet those engaged in electronic commerce as well as in general applications, need to be made aware of standard notation for currencies. For example, in actual e-com practices, the Canadian dollar is being represented as "CDN", "CAN", "CA", etc. Further, the 3 alpha codes of ISO 3166-1 for countries often are confused with the ISO 4217 3-alpha currency code.

4.3 EXAMPLE #2 — COUNTRY CODES AND LOCALIZATION WITH MULTILINGUALISM

Several international standards are used internationally for codes representing countries. The better known ones are ISO 3611-1, the USMARC Code List for Countries as maintained by the Library of Congress (LC), and the Universal Decimal Classification (UDC) auxiliary table for countries. Of these the ISO 3166-1 is the most widely known. {On the LC and UDC, see further Chapter 3.4 below}

This example focuses on ISO 3166-1. This standard and its contents is the responsibility of ISO TC 46 - Information and documentation. The purpose here is to highlight the need for an IT-enabled version of this standard, and also bring to the fore related localization and multilingual aspects. The title of ISO 3166 is "Codes for the representation of names of countries and their subdivisions". Within ISO 3166

standard, there are now three parts; namely:

- Part 1: Country Codes;
- Part 2: Country Subdivision codes; and,
- Part 3: Codes for formerly used names of countries.

Here ISO 3166-1 "established codes that represent the names of countries, dependencies, and other areas of particular geopolitical interest, on the basis of lists of country names obtained from the United Nations". Currently, each entry (or "record" of a permitted instance) contains:

(1) a three-digit numeric code
(2) a two letter alpha code
(3) a three letter alpha code
(4) a short name - English
(5) a long, i.e., formal name - English
(6) a short name - French
(7) a long, i.e., formal - French

ISO 3166 also has a note field in English and in French.

ISO 3166-1 thus has seven (7) "standardized" representations for each unique entity or object, three (3) of which are codes. ISO 3166-1 allows any one of the seven to be utilized although in practice, and especially in IT systems one usually utilizes one of the three codes.

For this ISO 3166 standard, we currently do not have a common international default "standard" for the interface among applications/information systems engaged in support of electronic commerce. The 3-digit numeric code, the 2-alpha code and the 3-alpha code are all used in interchanges.

Of these three codes, the three digit numeric code is the most stable and tends to change only when the physical boundaries change. Names short and long do change and at times the accompanying two and three-letter alpha codes as well.

The ISO 3166 Alpha-2 and Alpha-3 codes are not that stable, i.e., whenever a country changes its name it often also changes, its alpha-2 and alpha-3 codes, (e.g., Burma to Myanmar, Zaire to the Democratic Republic of the Congo, etc.). The 3-digit numeric code is much more stable. On the whole, it changes only when the actual physical boundaries of the countries change, i.e., the entity being identified and referenced is no longer the same. For example, the alphabetic (written language) equivalents to "3166:180" recently under went the following changes:

	Former	**New**
Alpha-2	ZR	CD
Alpha-3	ZAR	COD
Short Name (en)	Zaire	Congo, Democratic Republic of the
Long Name (en)	Republic of Zaire	the Democratic Republic of Congo
Short Name (fr)	Zaïre	Congo, la République démocratique du
Long Name (fr)	République de Zaïre	La République démocratique du Congo

The use of Alpha-3 code tags for ISO 3166 country name causes overlap confusion with ISO 4217 currency and funds codes which are represented as Alpha-3 codes (upper case).

Further, the 3-digit numeric code is linguistically neutral and unambiguous. Each of the 3-digit numeric codes has in ISO 3166 associated with it six (6) alphabetic linguistic expressions, two of which also serve as "human understandable" (and computer-processable codes).

From an interoperability perspective, i.e., both that of commerce and IT, the "3166" identifying the scheme and the rule set and the 3-digit numeric code identifying a country, in the context of this domain, together form an unique and an unambiguous global identifier for the entity being referenced. The alpha codes and names should simply be considered linguistic equivalent expressions, i.e., from an information systems perspective all that one may need to standardize at the interface is something akin to "3166:246", "3166:056", "3166:792", etc.

In addition, and also very important, **it should be noted that ISO 3166-1 contains many instances and associated codes for entities which are not "countries**", i.e., they are dependencies of other entities, (e.g., France, Great Britain, USA, etc.). Human beings "filter" and easily make these distinctions. Computers being very dumb cannot unless explicitly instructed to make things even worse many of these 3166-1 "sub-entities" have one code in 3166-1 and a different code in 3166-2. [Note: One would have thought that when ISO 3166 was split into its three parts, all the sub-entities in ISO 3166 would no longer be found in 3166-1 but be moved to 3166-2].

Further, we should note the fact that in their own locale and language, countries have their own "local" short and long (or formal) name. For example 528 Netherlands = "Nederland" and "Koninkrijk der Nederlanden". Further, countries which are bilingual have two sets of local short and long/formal names (e.g., 058 Belgium = "Belgie" and "Koninkrijk van Belgie", and "Belgique" and "Le Royaume de Belgique". There are also multilingual countries, (e.g., Switzerland). Exhibit 3.3 provides an illustrative example.

Then, there is the fact that many countries use non Latin Alphabet-based character sets. This means that one also has the original country language character script as "alphas" plus their "latinized" equivalents.

To this is added the fact that from the perspective of each country and language, the "other" countries have (are known by) their "own names". For example, a person in France uses "Allemagne" not "Germany" or "Deutschland" as the linguistic equivalent for "3166:280". All this is common, non-competitive information.

It suffices to state that all the rules and intelligence implicit in ISO 3166-1 (as well as 3166-2 and 3166-3) have not yet been captured explicitly in an IT-enabled and EC-facilitated manner, (e.g., as a "normalized" (callable) database).

This section concludes, with Exhibit 3.3 where, in matrix form, we present in the left column titled "IT-Needs", i.e., the "interface" requirement for ISO 3166-1 among information systems. In the right-side columns are presented some examples of the multiple linguistic equivalents required to support "Localization and Multilingual" requirements for particular implementations and supporting IT applications which in turn may have human readable User Interfaces.

Notes on Exhibit 4.3

[1] Normally the eight (8) "fields" under "Localization and multilingualism" would be separate (sets of)

"columns" in a database schema all forming part of the "row". It is noted that the physical presentation here in Exhibit 4.3 does not reflect this.

[2] The 2-letter language codes, (e.g., en, fi, fr, nl, sv, tr), are taken from ISO 639.

[3] The "->" entries are not part of ISO 3166-1 and represent examples of "local" requirements and use. Although only the Latin alphabet character set is utilized in this and the other two examples, it is understood that non-Latin characters/symbols are also used or will be used in electronic commerce. As such this is an "illustrative" example.

EXHIBIT 4.3 - TOWARDS AN IT-ENABLED STANDARD FOR ISO 3166 - COUNTRY CODES

Common IT Interface	Localization and Multilingual Equivalents [1]			
3166:246	Alpha-2: FI		Alpha-3: FIN	
	Short Name (en) [2]:	Finland	Long Name (en):	Republic of Finland
	Short Name (fr):	Finlande	Long Name (fr):	République de Finlande
[3] ->	Local Short Name (fi):	Suomi	Local Long Name (fi):	Suomen tasavalta
->	Local Short Name (sv):	Finland	Local Long Name (sv):	Republiken av Finland
3166:056	Alpha-2: BE		Alpha-3: BEL	
	Short Name (en):	Belgium	Long Name (en):	Kingdom of Belgium
	Short Name (fr):	Belgique	Long Name (fr):	Royaume de Belgique
->	Local Short Name (nl):	Belgie	Local Long Name (nl):	Koninkrijk van Belgie
->	Local Short Name (fr):	Belgique	Local Long Name (fr):	Royaume de Belgique
3166:792	Alpha-2: TR		Alpha-3: TUR	
	Short Name (en):	Turkey	Long Name (en):	Republic of Turkey
	Short Name (fr):	Turquie	Long Name (fr):	République turque
->	Local Short Name (tr):	Turkiye	Local Long Name (tr):	Turkiye Cumhuriyeti

4.4 EXAMPLE #4 — LANGUAGE CODES AND CONCORDANCE AMONG INTERNATIONAL STANDARDS

At times several different standards are used internationally for the same domain. One such domain is that of codes representing languages. With respect to sets of codes representing "languages" (and "countries"), these provide examples where the ISO is not the only organization to issue and maintain standards used world-wide even though its standard is the most widespread used and known, i.e., ISO 639, "Codes representing the names of languages". This standard and its contents is the responsibility of ISO TC37 - Terminology (principles and coordination).

Another international standard providing a coding schema for country codes and language codes is that of the US Library of Congress. Its primary application is in the bibliographic/information sciences domain. It should be noted that these coding schemas pre-date those of the ISO. For country codes the Library of Congress uses two or three character lower case alphabetic codes. These represent existing national entities, provinces and territories of Canada, states of the United States, divisions of the United Kingdom, and internationally recognized dependencies. It is known as the USMARC[3] Code List for Countries and is maintained by the Library of Congress. Similarly the Library of Congress maintains a USMARC Code List for Languages. This code list consists of three letter mnemonics representing only written languages of the modern and ancient world. "*Where one spoken language is written in two different sets of characters, each set of characters is assigned a specific code. For example, Serbian and Croatian are the same spoken language but the former is written in the Cyrillic alphabet and the latter in the Roman alphabet"* ("Roman" is known within ISO as the "Latin" character set).

A third international standard, the Universal Decimal Classification (UDC) scheme also has language codes. The UDC is used in the bibliographic/information science work (primarily in Europe), as well as increasingly used there for classifying documents on the Internet.

Human beings can recognize and filter these differences, computers cannot unless explicitly instructed. Keeping in mind that the scope and definitions of these different coding schemes also differ for what are generally the same business needs, one can bridge such differences through construction of concordance tables. This allows one to maximize, insofar possible, interoperability across differing sectorial perspective as well as identifying "non-interoperability" instances.

In ISO 639 each entry (or permitted instance) consists of:

- a language symbol, in the form of a two-letter code;
- the language name - English
- the language name - French
- the original language name (as written in the Latin-1 alphabet).

ISO 639 also has a note field in English and in French.

With respect to ISO 639, two initial observations must be made. The first is that Canada (and the United States) has not adopted ISO 639 as a "national standard" due primarily to its current lack of inclusion of North American aboriginal and native languages. Secondly, the LANG attribute is important in SGML (ISO/IEC 8879). for example, in the proposed New Work Item (ISO/IEC JTC1 N4742) for "Standard

[3]The acronym "MARC" stands for "Machine Readable Cataloguing". The preceding characters represent the country who utilize the "MARC" format, have amended it for their specific cataloguing needs, and have an infrastructure at the national level for addressing these national needs. There are primarily 3 countries namely the US, Canada, and the UK Hence the designation of, USMARC, CANMARC, UKMARC.

HTML", the LANG attribute

> *"identifies a natural language spoken, sung, written or otherwise used by human beings for communication between people. Computer languages are explicitly excluded. The value of the LANG attribute is referred to as the "language tag"... The name space of language tags is administered by IANA. Example tags include: en, en-US, en-cockney, i-cherokee and x-pig-latin.*
>
> *Two letter primary tags are reserved for ISO 639 language abbreviations. This Committee Draft does not specify three-letter primary tags, however their description may be found in the "Ethnologue" {Gri92}. Any two-letter initial sub-tag is an ISO 3166 country name..."*

Serious reflection and more systematic thinking is required here with respect to "tags" especially if one wishes to use SGML → HTML → XML generally and in electronic commerce specifically as well as ensuring interoperability not only with the use of other syntaxes but among various consumer markets, industry sectors, etc.

First of all, "i" and "x" are single characters; and they do not exist in ISO 639. Secondly, "cherokee" and "pig-latin" are not ISO 639 languages. Thirdly, for "en-us", it is not clear at all, given the other examples whether this represents English language as used in the United States or something else.

Fourthly, use of Alpha-2 code tags for ISO 3166 country name is confusing vis-à-vis ISO 639 language codes. They overlap and are not mutually exclusive. This at times is confusing for humans (and even more so for "dumb" computers). Fifthly, in many sort algorithms and search/retrieval engines, upper and lower case letters are treated the same. This causes even more confusion in IT-enabled processing of these code sets if two letter alphas are used as codes for both countries and languages.

Finally, there is an urgent need to update ISO 639 to include North American aboriginal and native languages as well as providing for a systematic means for handling and registering user extensions, (e.g., "cockney", "pig latin", "klingon", etc.). Alternatively, one could consider developing an "ISO 639 Level 2" standard for codes representing user extensions of the nature noted above, as well as "historical languages", , i.e., as is being developed for ISO 3166-3.

Even more important is the need to develop a systematic and unambiguous interworking in an IT-enabled manner among language code (ISO 639), currency and fund codes (ISO 4217) and country codes (ISO 3166-1).

One should also develop mechanisms for the interchange of the "same" data content from a cross-industry sector perspective but using different code sets in the same domain. To assist in progressing work in this area, chapter concludes with an Exhibit 4.4 which consists of a sample concordance table (English language version only) for ISO 3166 (Country Codes) + ISO 639 code set on the one hand, and on the other, the equivalent Library of Congress (LC) country and language code set and the UDC language code set.

Notes on Exhibit 4.4

[1] As provided by Féderation internationale d'information et de documentation (FID) based on documentation prepared in 1994 (and verified with them early 1998). The UDC also has "country codes", i.e., "place codes", as a "common" auxiliary table, but this has not been included in Exhibit 4.4.

[2] For human representation, we have included the "Short Name - English" as the linguistic equivalent for the ISO 3166-1 3-digit numeric code.

[3] For human representation, we have also included the ISO 639 English name of the language. There is also the French name and of course the actual "name" of the language in the language itself. ISO 639 captures this "Original" name in its Latin alphabet equivalent version.

[4] One notes that the LC alpha country codes are not the same as ISO 3166-1 alpha codes for the same entities.

[5] Added here to indicate that in Canada under the Nunavut Act, a new "territory" will be established 1 April, 1999 from the existing Northwest Territories, i.e., "Nunavut". In Nunavut, in addition to English and French, Inuktitut will become a recognized "official" language. The language code "ik" is the one that has been reserved for Inuktitut.

[6] In ISO 639 the "ik" represents "Inupiak" which is grouped/classified as an "Eskimo language". In UDC, the language code 562 refers to "Inuit". There is no code in the UDC for "Inuktitut" *per se*.

[7] The LC codes place "Inuktitut" under the Eskimo family of languages.

[8] One notes that all LC language codes are not the same as ISO 639. At times even the first letter is not the same, (e.g., "nl" versus "dut").

EXHIBIT 4.4 — SAMPLE CONCORDANCE OF STANDARDS FOR COUNTRY AND LANGUAGE CODES: ISO, LC AND UDC

ISO				Library of Congress		UDC [1]
3166-1		639				
Numeric Code	**Short Name (E) [2]**	**Applicable Languages (E) [3]**	**Applicable Language Codes**	**Country Codes**	**Language Codes**	**Language Codes**
3166-1:124	Canada	English	en	xxc [4]	eng	= 111
		French	fr		fre	= 133.1
		Inuktitut [5]	ik [6]		esk [7]	= 562
3166-1:056	Belgium	French	fr	be	fre	= 133.1
		Dutch	nl [8]		dut	= 112.5
3166-1:246	Finland	Finnish	fi	fi	fin	= 511.111
		Swedish	sv	sw	swe	= 113.6
3166-1:792	Turkey	Turkish	tu	tu	tur	= 512.164
3166-1:840	United States	English	en	xxu	eng	= 111
3166-1:826	United Kingdom	English	en	xxk	eng	= 111
		Scots Gaelic	gd		gae	= 152
		Welsh	cy		wel	= 153.1

4.5 COMMODITY CODES: IT-ENABLED WITH LOCALIZATION AND MULTILINGUALISM

In combining multilingualism and localization requirements, one must recognize the fact that associated with use of a language, (e.g., English, French German, Spanish, Portuguese, etc.), there are various "local" uses of the same natural language. The same object may well be and is often used and known by different terms in the same language in different local usage conventions. The Universal Product Code (UPC) and European Article Numbers (EAN) systems recognize this as they have multilingual terms associated with each code for "local" packages/labelling purposes. This has implications for Electronic Commerce and particularly that via the Internet. For example, English as a language is in use in many countries or "locales", (e.g., Australia, Britain, Canada, India, Ireland, Jamaica, New Zealand, USA, etc.), but has different local uses in each. Similar examples exist for other languages.

In this context, the BT-EC took the example of an enterprise wishing to sell potatoes world-wide. This is a simple example yet representative of the interplay of the four horizontal issues. This means that these goods have to pass through customs for export/import into various countries. The custom authorities world-wide have an organization that sets common rules and procedures, i.e., the World Customs Organization (WCO), formerly the Cooperative Customs Council (CCC)[4]. The WCO has established a classification scheme for goods traded called the Harmonized System (HS). It was formerly known as the Brussels Tariff Nomenclature (BTN). As such the HS for "commodity codes" is an internationally recognized standard although of a non-ISO/IEC/ITU origin.

Within the Harmonized System (HS) of the WCO, the general code for potato (fresh or chilled) is "0701". This linguistically neutral code "0701" is a data item or data element instance in the HS permitted value domain. Here the German German equivalent name of "potato" is "kartoffel", but the Austrian German equivalent is "Erdapfel". Similarly, the Spanish Spanish equivalent name is "patata" while the Mexican Spanish equivalent name is "papa", and the Dutch equivalent is "aardappel", etc. In French, the dictionary term is "pomme de terre", with "patate" as a "local" specific, i.e., Canada/Quebec term (and one which is not slang). The equivalent names noted above are thus <u>culturally adapted equivalent linguistic expressions</u> associated with "0701". Depending on the "locale," the appropriate human oriented names or linguistic expressions can be systematically/automatically generated from the linguistically neutral numeric code for human understanding, product labelling, reporting, filing, etc., and, where required, in multiple languages.

From a more detailed analysis, one can conclude two key aspects of the interworking of "localization", "cultural", and "multilingual" requirements; namely:

(1) that within a jurisdiction, (e.g., a country, a province, canton, etc.), there can be more than one natural language of use; and,

(2) that localization needs can result in a product, i.e., entity or object, having more than one equivalent "name" within a particular natural language.

In Exhibit 4.5, we present the "potato" from an IT-enabled and EC-facilitated perspective. Again on the left-hand side of the matrix, under "IT-Needs (Interface)," we identify the schema ID, i.e, "HS" along with the permitted value, i.e., in this case 0701 for potato. In the middle column, we present examples of countries that import potatoes, i.e., using their ISO 3166 country code and short name (English), while on the right-hand side, we present linguistic equivalents required to support local and multilingual

[4]The WCO is but one example of "coordinated autonomy" among autonomous organizations. The degree to which autonomous organizations achieve interoperability from a business operational perspective sets the limit to the extent of interoperability of supporting IT-based functional services.

requirements from both a jurisdictional and consumer perspective.

Notes on Exhibit 4.5

[1] Exhibit 4.5 focuses on human understandable representation of what should be an IT-enabled global standard for trade in goods based on the existing Harmonized System (HS) of the World Customs Organization (WCO). The example here is "potato", i.e., fresh or chilled potatoes, where, under the HS, "0701" is the primary code, and ".01" is for seed potato, while ".09" is for "other potatoes". For the purpose of this example we use "0701". There are additional codes for potatoes which are "frozen", i.e., 0710.10, "cut/sliced/broken or powder", i.e., 0712.10, etc. Each of these will have their own local/linguistic equivalents. Further, there are "sweet potatoes" which could provide an even richer example.

Finally, it is understood that there are other set of codes, i.e., value domains, where "potato" as an instance is identified and referenced with a different code. For example, in the domains of agriculture, pesticides, retail/food stores, etc.

In classification and coding schemas utilized in these other sectors, "potato" has a different code. This is understandable since the goal of the business context in which they are used is quite different from that of customs authorities.

[2] The country code and short name are taken form ISO 3166-1. Here they represent a jurisdictional level.

[3] The 2-letter language codes, (e.g., de, en, es, fi, fr, ik, nl, sv), are taken from ISO 639.

[4] In 1999, Nunavut will become a new territory with Inuktitut as an added "official" language to English and French. In Inuktitut "potato" is "patiti" (transliterated Latin character set equivalent) to the Inuktitut language character string used to designate "potato"

EXHIBIT 4.5 - COMMODITY CODE EXAMPLE "POTATO" [1]

Common IT Interface	Country Code - Short Name (en) [2]	Localization and Multilingual Equivalents [3]
HS: 0701	124 CANADA	(en): potato (fr): pomme de terre (ik): patiti [4]
	464 MEXICO	(es): papa
	724 SPAIN	(es): patata
	040 AUSTRIA	(de): erdapfel
	276 GERMANY	(de): kartoffel
	056 BELGIUM	(fr): pomme de terre (nl): aardappel
	246 FINLAND	(fi): peruna (sv): potatis

ANNEX A - EXTRACT FROM JTC1/BT-EC REPORT: "CLAUSE 6 - HORIZONTAL ASPECTS"[5]

A.1 Overview

BT-EC identified four horizontal issues as being of general relevance for all scenarios involving Electronic Commerce and gave these horizontal issues some prominent attention in its work. These issues are:

- information technology (IT)-enablement,
- localization including multilingualism,
- cross-sectorial aspects,
- cultural adaptability.

These horizontal issues are ordered here on the basis of

1. the need to go from the simpler to more complex challenges,
2. placing priority on the "do-able" and immediately most useful in the context of increasing resource constraints in standardization work; and,
3 promotion and visibility of ISO/IEC JTC1 work within the ISO, IEC and ITU and especially outside of these standardization communities.

From a user perspective, these four horizontal issues need to be addressed in a harmonized manner.

A key characteristic of commerce world-wide, in particular in the business-to-business and business-to-administration domains, is that it consists of business transactions which:

1. are rule-based, i.e., mutually understood and accepted sets of business conventions, practices, procedures, etc.; and,
2. make extensive use of "codes", often table-based, representing predefined possible choices for common aspects of business transactions. Examples include countries, currencies, languages, manufactures and their products.

Many of these sets of agreed-upon rules used in business world-wide and their associated lists of tables/codes are "*de jure*" and "*de facto*" standards. BT-EC noted that numerous international standards are already in use in support of commerce world-wide. The problem is that most are paper-based and lack a computer-processable version. Even if distributed in electronic form, these standards including those of ISO, used in commerce world-wide consist of tens of printed pages. They cannot be "plugged-in" for use in Electronic Commerce. Much of the intelligence in these international standards is humanly understandable explicitly or implicitly. They have not been described formally using Formal Description Techniques (FDTs), i.e., in their present form they do not support "computational integrity". Consequently, each enterprise using these code sets has to spend considerable time and effort to (1) determine their meaning and interpret them; (2) build applications; and, (3) hope that they interoperate with other networks or enterprises.

Human beings like to name "objects". But the approach of using "names" is not very IT friendly, cost-efficient or time-efficient.

[5] Apart from some minor editing changes, (e.g., spelling, typos, etc.), Annex A in this Canadian contribution is a verbatim extract of Clause 6 of the BT-EC Report to JTC1, i.e., JTC1 N5296, pages 22-27.

Depending on the interplay of multilingual and localization requirements, in Electronic Commerce, a singular product or service being offered for sale will have multiple names and differing names even in the "same" language. Thus, if we wish to ensure rapid and widespread use of Electronic Commerce globally, we must on the one hand identify "objects", i.e., products or services being offered for sale, in an unambiguous, linguistically neutral, and IT-processable and EC-facilitated manner, and, on the other hand, present the same via a range of linguistic names (and associated character sets) from a point-of-sale perspective, i.e., human-readable user interface, as required by the "local" marketplace.

In order to provide a focus for its work on horizontal issues, the BT-EC utilized four real world examples; namely:

- Currency Codes,
- Country Codes,
- Language Codes,
- Commodity Codes.

(For details of these examples see Chapter 4 below and JTC 1/BT-EC N 047).[6]

These examples represent standards used for commerce world-wide and are presently implemented by enterprises and their information systems in wide variety of different ways. There are also no "standard" ways for the interworking among these and similar standards. This does not promote global interoperability. The recent widespread use of the Internet is exacerbating existing ambiguities.

From a BT-EC perspective, these four examples underline the fact that with respect to electronic commerce there may be less of a need for new standards. Rather the immediate challenge may well be the development of a category of information technology standards which will facilitate the development of information technology enabled versions of existing standards used in commerce and do so in a manner which also supports the interplay of localization and multilingual requirements, i.e., "bridging standards".

BT-EC wishes to pass on the following considerations for such standardization work in support of Electronic Commerce; namely:

1. Standards must focus on the interface (as opposed to implementation) as the best means of arriving at globally harmonized solutions for interoperability from both a business and information technology perspective.

2. Standard interfaces among information systems must be technology neutral accommodating advances in technology to the extent possible. Further, such standard interfaces must be linguistically neutral to the furthest extent possible.

3. In order to empower users and consumers, standards should be adaptable to local and multilingual requirements at national and regional levels, while ensuring full transparency of available market solutions to the consumer. Multilingualism must be considered. The expansion of open, multilingual standards could significantly increase the volume and value of world-wide Electronic Commerce.

A.2 Information Technology (IT) -enablement

[6] In this document, see Chapter 3 above.

"IT-enablement" is the term used to identify the need to transform currently accepted standards used in commerce world-wide from a manual to a computational perspective. Electronic commerce, in particular of the Business-to Business or Business-to-Administration categories, introduces a requirement for standards that are prepared, structured and made available for unambiguous usage within and among information systems. This requirement can be expressed as "computational integrity", in particular:

"the expression of standards in a form that ensures precise description of behaviour and semantics in a manner that allows for automated processing to occur, and the managed evolution of such standards in a way that enables dynamic introduction by the next generation of information systems".

The objective of IT-enablement is to capture in a computer-processable manner, and one which maximizes interoperability, the implicit rules and relations (i.e., those known to "experts") of the code sets found in standards used in commerce world-wide, i.e., capture and state from an entity relationship and/or object technology perspective, using Formal Description Techniques. Also, issues arising from change management in "code tables", i.e., synchronization, backwards compatibility, migration, etc. need to be addressed.

IT-enablement is based on the premise that a detailed and exhaustive identification of standards and "conventions", etc., used in support of existing commerce, will eliminate many barriers to Electronic Commerce.

IT-enablement recognizes that within ISO, IEC and ITU, there are committees which have the domain responsibility and expertise in areas of work, the primary purpose of which is to manage and control the content. IT-enablement also recognizes that outside of ISO/IEC/ITU, there are many other organizations which have domain responsibility and expertise in subject areas relevant to global Electronic Commerce. Their "content" and industry sector domain oriented standards require an IT-enabled version for use in Electronic Commerce.

BT-EC suggests that JTC1 gives proper consideration to IT-enablement, initially focused on currency, country, language and commodity codes. Members of BT-EC are of the opinion that such work will serve as the necessary practical experience and expertise needed to develop a generalized approach to "IT-enablement". This should also help to support localization and multilingual requirements.
(For further information, see document ISO/IEC JTC 1/BT-EC N 46.)

A.3 Localization and multilingualism

IT-enablement is based on the premise that to ensure rapid and widespread use of Electronic Commerce globally, we must on the one hand identify "objects", i.e., products or services being offered for sale, in an unambiguous, linguistically neutral, and IT-processable and EC-facilitated manner, and, on the other hand, present the same via a range of linguistic names (and associated character sets) from a point-of-sale perspective, i.e., human-readable, as required by the "local" marketplace.

BT-EC reviewed existing JTC1 terms and definitions of "locale", (see ISO/IEC JTC 1/BT-EC N 46). Those aspects normally are related to the character sets associated with a natural language, including collating/ordering, data/time formats, monetary formatting, etc., a.k.a. "cultural elements".

From an Electronic Commerce perspective, BT-EC identified four additional sets of parameters of "localization" requirements which should be addressed, namely:

1. jurisdictional requirements, i.e., various combinations of "top-down" legal and regulatory frame-works which place constraints on the global marketplace and in doing so, often define/establish a "local" market;

2. consumer requirements, i.e., combinations of "bottom-up" consumer demands and behaviour;

3. supplier requirements, i.e., combination of factors impacting on suppliers of goods and services (as well as those involved in supporting logistics chains); and,

4. human rights-related requirements, (e.g., disabled/handicapped, privacy, etc.).

BT-EC defines "localization" as:

localization: pertaining to or concerned with anything that is not global and is bound through specified sets of parameters of:

(a) a linguistic nature including natural and special languages and associated multilingual requirements;
(b) jurisdictional nature, i.e., legal, regulatory, geopolitical, etc.;
(c) a sectorial nature, i.e., industry sector, scientific, professional, etc.;
(d) a human rights nature, i.e., privacy, disabled/handicapped persons, etc.; and/or
(e) consumer behaviour requirements.

Within and among "locales", interoperability and harmonization objectives also apply.

From an Electronic Commerce perspective, "jurisdiction", on the whole, represents a set of local market entry and/or participation requirements which may be of a general nature or product/service-specific.

From a legal perspective, the basic entity is the country. Two or more countries among themselves can form a common harmonized "jurisdiction" governing the marketplace, through a bilateral or multilateral agreement. Where these agreements are of a general nature, the harmonized "jurisdiction" is know as a "region". Examples here include the European Union, NAFTA, etc.. Within countries, there may be various approaches to more granular legal and regulatory frameworks, e.g., at the level of states, provinces, etc.

In addition to a jurisdiction with a geographic dimension, there are jurisdictions bounded by a goods and services dimension. Examples here include airlines, banking, oil companies, etc. Here jurisdiction is often expressed through treaties, regulations, agreements, etc., which are harmonized through an entity representing these communities (e.g., ICAO, WCO, or WTO).

Combinations of laws and regulations can be viewed as frameworks. BT-EC can thus define jurisdiction as:

"jurisdiction: a distinct legal and regulatory framework which places constraints on the global market-place and in doing so often defines/establishes a local market".

Electronic commerce is "borderless" in its nature - it transcends jurisdictions.

From a BT-EC perspective, multilingual requirements comprise more than just the need to support the character sets and sort/collate sequences of the various languages used by customers world-wide. It also means that a single natural language is utilized in different ways in various local markets.

In addition, one should add the concept of special languages, i.e., those of a scientific or technical nature, as well as those which pertain to a specific industry sector. Many of these can be considered to be global in nature and use.

Thus from an Electronic Commerce perspective, "multilingual" requirements embody not only:

1. multiple natural languages; but also,
2. multiple and different uses of the "same" natural language;
3. multiple source languages in any multilingual thesauri, database, referenceable permitted value domains (PVDs), i.e., tables, code sets, etc.; and possibly also,
4. the use of special languages.

In this context, one can define:

multilingualism: "the ability to support not only character sets specific to a language (or family of languages) and associated rules but also localization requirements, i.e., use of a language from jurisdictional, sectorial and consumer marketplace perspectives".

From a BT-EC perspective adding multilingual capabilities in Electronic Commerce can be viewed as simply mirroring the existing physical world requirements. Prime examples here are product labelling requirements and product usage instructions. Given the increasing globalization in trade in goods, single language usage instructions accompanying products are increasingly rare and multilingual usage instructions increasingly common place.

A.4 Cross-Sectorial issues

Cross-sectorial issues pertain to differing, at times conflicting, understandings of business practices, object identification, etc., among economic sectors. The challenge here is that of resolving two sets of issues:

1. Industry sectors, scientific fields, and professional disciplines assign their own uses or meanings to the terms of a natural language. Quite often natural languages are used in the manner of what we earlier called "special languages": the same word/term frequently has very different meanings in other industry sectors. There is a trend in various sectors towards using existing non-technical "common language" words as terms with new technical meanings. This problem of polysemy needs to be taken into account in cross-sectorial Electronic Commerce.

2. Multilingual equivalency needs to create an added layer of complexity and even more so for unambiguous cross-sectorial interoperability in support of Electronic Commerce (as well as world-wide "individual-to-business" Electronic Commerce via the Internet).

A case study on cross-sectorial issues (see JTC 1 /BT-EC N 045) led in respect to scientific languages to the conclusion that a scientific language can be considered a culturally neutral exchange language which, in turn, has multiple natural language and culturally dependent linguistic equivalent terms.

Technical languages and their use in particular industry sectors, however, do present particular challenges to cultural adaptability and cross-sectorial interoperability since they do not have the attributes of scientific languages. Technical languages as linguistic sub-systems are difficult enough to handle even within their industry sector, in one natural language. To this are added the challenges of localization,

multiculturalism and cross-sectorial interactions in Electronic Commerce.

Each industry sector interacts with other sectors. A key characteristic of special languages is an associated controlled vocabulary of terms, often also in a multilingual manner.

In conclusion, it should be noted that within industry sectors, established standards and conventions exist for unambiguous identification and referencing of unique objects, and for naming them (often multilingually), along with associated rules. Although not originally designed to interoperate across and among industry sectors, many of these sectorial standards have core constructs in common which could be utilized to support cross-sectorial Electronic Commerce and in a manner which accommodates localization and multilingual needs.

A.5 Cultural adaptability

BT-EC viewed "cultural adaptability" as a set of requirements affecting global Electronic Commerce from a cultural perspective and noted that these can co-exist within "localization" and "multilingualism" requirements. In addition, there are societal aspects which often are not bounded by jurisdiction or geographic area (e.g., Jewish and Muslim cultures transcend jurisdictional boundaries).

The following definition of "cultural adaptability" is found in JTC 1 N4627:

The special characteristics of natural languages and the commonly accepted rules for their use (especially in written form) which are particular to a society or geographic area. Examples are: national characters and associated elements (such as hyphens, dashes, and punctuation marks), correct transformation of characters, dates and measures, sorting and searching rules, coding of national entities (such as country and currency codes), presentation of telephone numbers, and keyboard layouts".

This definition of the concept/term "cultural adaptability" is the same as that for "cultural elements" found in ISO/IEC JTC 1/CAW N 008. It has a focus on special characteristics of natural languages and commonly accepted rules for their use which are particular to a society or geographic area. The emphasis here appears to be on character sets, scripts, glyphs, etc., their ordering, sorting, search, etc.

However, in commerce world-wide, it is not so much the natural language but the usage of special languages (e.g., technical and scientific), which forms a significant challenge to providing interoperability in Electronic Commerce. This is true especially for "technical" uses of natural languages by different industry sectors. Differences in uses of a natural language exist also in industry sectors which represent sets of requirements other than those particular to a society or geographic area.

BT-EC made an effort to coordinate the work on this horizontal issue with the JTC 1/CAW (Cultural Adaptability Workshop). BT-EC notes Resolution 3 of JTC 1/CAW which states "that CAW did not have time to address the request of JTC 1 to elaborate or amend the definition of cultural adaptability as contained in the document JTC 1 N4627".

From an Electronic Commerce perspective, standardization work addressing the three horizontal issues associated with

- "IT-enablement",
- "Localization and Multilingualism", and
- "Cross-Sectorialization"

should resolve some of the requirements for "cultural adaptability". It then remains to be seen what other "cultural adaptability" requirements remain, i.e., those of a societal nature (see also 5.2.2)"

[Note: Section 5.2.2 in the BT-EC Report pertains to "Consumer requirements for Electronic Commerce"].

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