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Initial Draft Strategy
for Support of Linguistic Requirements of
Canada's First Nations and Aboriginal Peoples
in
International Standards & e-Learning

Prepared for:

Susan Mongrain, EduSpecs
Yuri Daschko, Manager
E-Learning Marketplace Strategy (ELMS)
Industry Canada

Prepared by:

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29 October, 2004

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EXECUTIVE SUMMARY

The federal government, through Industry Canada's Information Highway Application Branch (IHAB) has launched the First Nations SchoolNet initiative. Its objective is to provide access to Internet connectivity and e-learning opportunities for First Nation schools under federal jurisdiction. For this initiative to be meaningful and implementable, there is a need to ensure that e-learning can take place in the languages of the First Nations, and that e-learning resources are developed and can be identified, referenced, and accessed in the languages of the First Nations themselves. This includes ensuring that First Nations can use their own languages, build, access and share e-learning resources in their own language.

Canada actively participates in the development of international standards for e-learning in order to ensure that needs and priorities of Canada are incorporated into the development of these standards. This standards development is focused on ensuring that e-learning resources can be located and used effectively by being described in a consistent systematic standards-based way and be transferable across networks and IT-systems, i.e., through metadata. An international multipart standard ISO/IEC 19788 "*Metadata for Learning Resources*" is under development.

Consequently, it is vital that in ensuring that Canada's English/French linguistic requirements be supported in this international standard, and that one also ensure that the linguistic requirements of Canada's First Nations be supported as well as those of Canada's Aboriginal peoples (whose needs are similar). Thus for the First Nations SchoolNet initiative to be meaningful and implementable in a cost-effective and efficient manner, there is a need to develop a strategy and framework model for metadata for (electronic) learning resources and one which includes supporting and facilitating the ability of Canada's First Nations and Aboriginal peoples to develop metadata as well as the learning resources in their own languages. The development of this strategy results in one which supports at the minimum the written and oral linguistic requirements of Canada's First Nations and Aboriginal peoples and do so in an IT-enabled manner and maximize the use of international standards. At the same time, there is an opportunity for Canada to influence the development of these standards.

The E-Learning Marketplace Strategy (ELMS) group in IHAB supports the development and use of open international standards for interoperable learning technologies and applications to better support effective practice through its EduSpecs initiative. The ELMS group has commissioned this project, the results of which lay a foundation for the future ability of Canada's First Nations and Aboriginal peoples to participate and use of learning technology.

At present, information on what are the languages of Canada's First Nations and Aboriginal peoples exists in scattered form and is not definitive or authoritative. Much of what is available represents the perspective of English and French speaking sources and not those of Canada's First Nations and Aboriginal peoples themselves.

A multipart international standard exists for the registration of a language and the assignment of internationally recognized language identifiers (or "codes"), i.e., ISO 639. The ISO 639 language identifiers are used in information and communication technologies (ICT) to facilitate the use of ICT in that language.

This Report notes the importance of language identifiers to Canada's First Nations and Aboriginal peoples, their use and benefits, etc. The use of language identifiers as codes provides a cost-effective and efficient

approach to supporting linguistic requirements of any people especially in their use of ICT. Given the relatively small (economic) markets involved and the already recognized lack of resources required to support Canada's First Nations and Aboriginal peoples to be able to utilize ICT in their own languages, every effort should be made to reduce barriers and costs. Here **ensuring the existence of a standard international language identifier for each of the languages of Canada's First Nations and Aboriginal peoples is essential**. This is also an essential element in bridging the "digital divide communities".

This Report is written in a non-technical manner. Several chapters are of an informative and awareness raising nature. They are, however, based on detailed analysis. Several informative annexes are also included. It is most likely that those reading this Report will have different backgrounds, various perspectives and priorities, minimum experience in standards development, etc. Having common definitions and terms is a key to building common understanding. {See Annex C}.

A key aspect of this study is that apart from official languages, it also identifies as sources of requirements, many "legally recognized languages (LRLs)". For Canada's First Nations and Aboriginal peoples, linguistic requirements of an LRL nature are significant. Currently, LRL requirements (and rights) of Canada's First Nations and Aboriginal peoples are addressed on an ad-hoc basis (if at all) in use in ICT). An integrated and systematic approach is needed. Not only is this more cost-effective in the long term, it also facilitates the implementation of linguistic rights/obligations aspects of "land claim agreements", "self-government agreements", etc.

It is recognized that this is a complex matter but one which is resolvable and implementable in a pragmatic and cost-effective manner. It is also recognized that the activity of obtaining language identifiers is an activity which requires the involvement of Canada's First Nations and Aboriginal peoples. They are the key stakeholders in the decision-making processes involved.

Over thirty (30) languages of Canada's First Nations and Aboriginal peoples have been identified for which no international language identifiers exist. There may be more.

This Report recommends a pragmatic and action-oriented approach. Here the first and essential step is to start the process of preparing the application and supporting documentation required for the registration of a language under the international ISO 639 standard and obtaining a unique language identifier for it, i.e., as an ISO 639-2/T code. At a minimum, there are ten (10) languages of Canada's First Nations and Aboriginal peoples which should be considered for inclusion to ISO 639-2/T based on either them being official languages of Canadian territories/provinces or which are legally recognized languages (LRLs) in the same. **It is necessary to ensure the involvement and decision-making by Canada's First Nations and Aboriginal peoples. They will have to make certain decisions, the nature of which are identified.** {See Chapter 2.3.4}.

In conclusion, the decision and action taken based on this Report are very important, if not crucial, to:

- ▶ the ability to support linguistic requirements of Canada's First Nations and Aboriginal peoples in international standards and e-learning including those relevant to their use in any application involving information and communication technologies (ICT) and supporting ICT infrastructure(s);
- ▶ ensuring that such linguistic (user) requirements can and will be supported in the e-learning market (public and private sector components);

-
- ▶ the maximization of a cost-effective and efficient approach in use in ICT particularly from a user implementation perspective;
 - ▶ facilitating and maximizing an IT-enabled approach by ensuring that internationally recognized language identifiers exist, i.e., as part of ISO 639-2/T, for all the languages of Canada's First Nations and Aboriginal peoples; and,
 - ▶ ensuring that e-learning strategies (whatever their source) are based on and promote a common set of principles, i.e., including those already identified in this Report;

1.0 INTRODUCTION

1.1 BACKGROUND

Canada participates actively in the development of international standards in support of e-learning¹ in order to ensure that Canada's needs and priorities are incorporated into the development of these international standards. E-learning standards development includes those pertaining to digitized learning resources. Here are objective Canada's participation in the development of international standards is to ensure that e-learning resources can be located and used effectively by being described in a consistent, systematic standards-based way and be transferable across networks and IT systems.

The international standards development committee in the field of e-learning is ISO/IEC JTC1/SC36². Its mandate is standardization in the field of information technology for learning, education and training (ILET) to:

- (1) support individuals, groups or organizations (both public and private sector-based); and,
- (2) to enable interoperability and reusability of e-learning related resources and tools.

Through its membership in ISO/IEC JTC1/SC36 and establishment of the Standards Council of Canada's "Canadian Advisory Council (CAC) for ISO/IEC JTC1/SC36, (established August, 2002) individual Canadian expertise has been transformed into a cross-Canada, i.e., pan-Canadian, perspective. A key element here is advocating an inclusive and user requirements driven approach. This approach encompasses support for Canada's two official languages, (English and French), in ISO standards development and doing so within the context of a multilingual expandable capability and capacity for e-learning technologies³.

¹The working definition of "e-learning"/«apprentissage en ligne» in Canada is:

e-learning: the utilization of information and communication technologies (ICT) in support of user requirements in the areas of learning, education and training.

apprentissage en ligne: utilisation des technologies de l'information et de la communication (TIC) en support aux besoins d'un utilisateur dans les domaines de l'apprentissage, de l'éducation et de la formation.

This working definition has been contributed by Canada to ISO/IEC JTC1/SC36 as document SC36/ N0761 "Proposed definition for "e-learning"/«apprentissage en ligne»".

² ISO = International Organization for Standardization
IEC = International Electrotechnical Commission
JTC1 = Joint Technical Committee 1, i.e., of the ISO and IEC in the field of information technology.
SC = a sub-committee of ISO/IEC JTC1
36 = Information Technology for Learning, Education and Training (ILET)

³The official languages of the ISO are English, French, and Russian. For a recent example of an English/French bilingual standard with multilingual expandability, see ISO/IEC 5218:2003 (E/F) titled *Information technology - Codes for the representation of human sexes/Technologies de l'information - Codes pour la représentation des sexes humains*. It is an English/French single document standard which has been in use since 1977. The 2004 version includes an Annex A (Informative) titled "*Codes for the Representation of Human Sexes Supporting (Linguistic) Cultural Adaptability*".

When Canada became a "participating", i.e., full member, of ISO/IEC JTC1/SC36, i.e., in August 2002⁴, it made several contributions in support of the need for international standards for e-learning (and associated technologies) to be constructed in a manner which not only supports Canada's two official languages, i.e., bilingual English/French requirements, but also facilitates multilingual expandability⁵.

Within ISO/IEC JTC1/SC36, there is a Working Group 4, i.e., ISO/IEC JTC1/SC36/WG4⁶, which is responsible for "*Management and Delivery of Learning, Education and Training*". Its scope includes "*IT-related standardization for the management and delivery of learning, education and training, and its supporting technologies*".

Of particular relevance to this project and this resulting Report is the development of a new multipart standard of JTC1/SC36, through its Working Group 4 titled ISO/IEC 19788 "*Metadata for Learning Resources*"⁷. Part 2 of this multipart standard is titled "*Part 2: Data Elements*" and concerns itself with the identification and specification of these metadata elements, their semantics and various data element attributes. Over the next two years, the first two parts of this multipart ISO/IEC 19788 standard, i.e., *Part 1: Framework* and *Part 2: Data Elements* will be developed, and when completed and approved, will become the new international standard for metadata for e-learning

This Annex A provides examples of multiple "Human Interface Equivalents (HIEs)" from a multilingual user requirements perspective (including those involving not only non-Latin-1 based character sets, (e.g., Chinese, Japanese, Korean, etc.), but also from an "AccessForAll" perspective, (e.g., Bliss Symbolics). An "FDIS" copy of this bilingual international standard is freely available as document JTC1/SC32/N1067 via <<www.jtc1sc32.org>>. Note: Dr. Jake V.Th. Knoppers (Canada) is the international Project Editor for this ISO/IEC 5218 standard.

⁴A key factor here is the support of Industry Canada's MLG (now ELMS).

⁵The first two contributions by Canada to ISO/IEC JTC1/SC36 were those made by Dr. Jake V.Th.Knoppers and M.Janice Pereira. They are:

- ▶ *Maximizing Unambiguity in JTC1/SC36 Terms and Definitions through a Bilingual/Multilingual Approach* [ISO/IEC JTC1/SC36 N0306, 2002-08-22], available at <<www.jtc1sc36.org>>;
- ▶ *Maximizing Bilingual/Multilingual e-Learning Capability through Use in "Identifiers" Instead of "Names"*. [ISO/IEC JTC1/SC36 N0307, 2002-04-22], available at <<www.jtc1sc36.org>>.

From the moment that Canada started to participate in international standards development in e-learning in September, 2002, i.e., in ISO/IEC JTC1/SC36, it advocated an approach to international standards development which supported its bilingual requirements, i.e., English and French, and be multilingual expandable. This is also important from the perspective of Canada as a lead member of "la Francophonie" as it will facilitate developing countries interested in e-learning, who are members of "la Francophonie", to implement and use such e-learning standards.

⁶Further information on SC36/WG4, its activities, document register, etc., is available via <<www.jtc1sc36.org>>

⁷A metadata standard specifies the data elements required to describe a learning resource in order to make the search for retrieval and use of an e-learning resource as cost efficient and effective as possible. A key element here is that of the metadata standard providing a structure and definition of data elements required to describe or register, (e.g., via a catalogue), the learning resource as well as its requirements for use and requirements of those data elements.

resources⁸.

Consequently, it is vital, in addition to ensuring that Canada's English/French linguistic requirements be supported in this new multipart international ISO e-learning standard, that one ensure that the linguistic requirements of Canada's First Nations be supported and included (as well as those of Canada's Aboriginal peoples⁹). As such, there is a need to take action to support the linguistic requirements of Canada's First Nations (as well as those of Canada's Aboriginal peoples¹⁰.

Industry Canada's First Nations SchoolNet, an initiative under the Information Highway Applications Branch (IHAB), has as one of its objectives to provide access to Internet connectivity and e-learning opportunities for First Nations' schools under federal jurisdiction. **For this initiative to be meaningful and implementable, in a cost-effective and efficient manner, there is a need to develop a strategy and framework model for metadata for (electronic) learning resources which includes and supports the ability of Canada's First Nation and Aboriginal peoples to develop metadata in their own language as well as learning resources in their own languages¹¹**. The development of this strategy and framework model, in support of the same must be able to support at the minimum the written and oral linguistic requirements of Canada's First Nations and do so in an IT-enabled manner that (1) maximizes the use of existing international standards; and, (2) ensures that Canadian user requirements including those of its First Nations (as well as Canada's Aboriginal peoples) are supported in international standards, and particularly in those pertaining to e-learning metadata.

This project marks the first step in the development of such a strategy.

1.2 ROLE OF E-LEARNING MARKETPLACE STRATEGY (ELMS)¹², INDUSTRY CANADA

The E-Learning Marketplace Strategy (ELMS) group is part of Industry Canada's Information Highway

⁸Due to Canada's active participation in international standards committee for e-learning, i.e., through becoming a member of ISO/IEC JTC1/SC36, a number of opportunities are starting to arise for Canada to take a leadership role in international standards development in the field of e-learning. The opportunities here are real in that key Canadian experts are taking a leadership role in the development of new international standards in specific areas which are also of priority interest from a Canada-wide perspective. This will ensure that Canadian requirements are fully supported in international standard development work, (e.g., by using these requirements as a primary input for international standards development).

⁹See Annex C below for the definition of an "Aboriginal People" of Canada.

¹⁰Note: Even though the focus of this project is that of Canada's "First Nations", the work undertaken and the recommendations of this Report are inclusive in nature and are structured to include and support those of all of Canada's Aboriginal peoples.

¹¹It is assumed in this project and this resulting Report that the linguistic requirements of Canada's First Nations in particular as well as those of all of Canada's Aboriginal peoples in general are to be considered as part of a Canada-wide user requirements driven approach.

¹²The "E-Learning Marketplace Strategy (ELMS)" was formerly known as the **Multimedia Learning Group (MLG)**, i.e., until fall 2004. During the past few years our firm has undertaken a number of projects for the "MLG" the results of which are relevant to this project. Citations for such reports, documents reference the Multimedia Learning Group (MLG).

Application Branch (IHAB), which consists of a number of initiatives with the common objective of connectivity for the purpose of e-learning.

The ELMS group enables the development and use of online content and applications by supporting development, adoption and use of open technical standards for interoperable learning technology and applications to better support effective practice through its *EduSpecs*¹³ initiative. It does this through its membership in various international standards and specification organizations, including the International Standards Organization Joint Technical Committee 1/Sub-Committee 36 (ISO/IEC JTC1/SC36), and support for Canadian expertise to participate in SC36's Working Group (WG) 4 whose focus is metadata for learning resources (MLR).

ELMS group has commissioned this project in support of First Nations SchoolNet to ensure that the development of the Metadata for Learning Resources multipart standard (ISO/IEC 19788-2 *ILET-Metadata for Learning Resources - Part 2: Data Elements*) includes the ability to support and facilitate the multi-linguistic requirements of Canada's Aboriginal peoples. This will lay a foundation for the future ability of Canada's First Nations and Aboriginal peoples to participate fully in the development and use of learning technology.

1.3 ISSUES AND IMPORTANCE OF "LANGUAGE IDENTIFIERS"

In this section, we highlight some of the issues. In addition to those of a general nature, we identify specific issues linked to relevant federal government initiatives (with the focus on those of Industry Canada)¹⁴.

In this project **"linguistic requirements"** refers to requirements supporting the ability of a people to be able to use their language(s) for communication in both oral and written forms. In particular, it pertains to the need to ensure that this includes the ability of information communication technologies (ICT) to be able to support the use of the language(s) of a people.

A necessary first requirement is that of a "recognized" language identifiers for the names of the language used (to be used). This world-wide need has been recognized and addressed through the development and continuous updating of the international multipart ISO 639 standard titled "Codes for the representation of names of languages". {See further Chapter 2.3 below}.

1.3.1 Importance of Language Identifiers to Canada's First Nations and Aboriginal Peoples

Thus the key issues here are (formulated as a series of questions):

¹³See further <<<http://eduspecs.ic.gc.ca>>>

¹⁴It should be noted that this is a limited resourced and scoped project which has arisen out of a single objective of EduSpecs, ELMS, i.e., to ensure that the development of international ISO/IEC JTC1/SC36 standards for e-learning and specifically the multipart standards development project for "Metadata for Learning Resources". However, the strategy being proposed is of general applicability and benefit.

- ▶ "What are the languages of Canada's First Nations and Aboriginal peoples?"
- ▶ "What are the names of these languages, i.e., in the language of the people who use them"?

This is a key issue and detailed further in Chapter 3.2.

- ▶ "Do language identifiers, i.e., as internationally recognized codes (in ISO 639), exist for these languages"?

The issue here is that **without an internationally recognized language identifier a "language" does not exist in the virtual world of ICT including the Internet, i.e., as an identifiable and referencable fundamental component of the ICT infrastructure.**

- ▶ "Does an existing language identifier and name(s) of a language in ISO 639 reflect the linguistic requirements and perspective of Canada's Aboriginal peoples for that language"?

The (preliminary) analyses undertaken for this project have identified issues of (1) changes of names in languages by Canada's First Nations and Aboriginal peoples not reflected in ISO 639-2; and, (2) the real possibility that "their language" is a distinct language, (e.g., not a dialect, uses a different script), etc.

1.3.2 Uses of Language Identifiers

Language identifiers are used:

- ▶ to indicate the language(s) in which documents and any resources are written, recorded, presented, or available (including legal requirements for the same);
- ▶ to indicate the language(s) in which description(s) or metadata about a document or resource are available, i.e., independent of the language(s) of the document or resource itself;
- ▶ to indicate the original language(s) of a document;
- ▶ to indicate the language to which a term belongs;
- ▶ to indicate the capability of IT systems to handle/process data (and metadata) of a resource;
- ▶ to indicate the language(s) to which software resources can be applied;
- ▶ to indicate the language - speaking capabilities of interpreters, translators, etc., from one language to another (including services of a similar nature available as a web-based service);
- ▶ to indicate whether alternative abstracts or summaries of documents/resources are available; and,
- ▶ to indicate the language - speaking capabilities of delegates to a meeting.

1.3.3 Benefits of Language Identifiers

Language identifiers are codes, i.e., a set of codes functioning as a coded domain. Key benefits of the use of "codes", as applied to the identification of languages include:

- ▶ reduction in time required to record and/or format the representation of names of a language;
- ▶ improve the clarity and accuracy of interchange;
- ▶ minimize the amount of human intervention required for communicating the representation of names of languages;
- ▶ reduce costs;
- ▶ serve as a common basis for international exchange of information containing language sensitive data elements.

Thus the use of language identifiers as codes provide a cost effective and efficient approach to supporting linguistic requirements. Given the relative small (economic) markets involved and the already recognized lack of resources required to support Canada's First Nations and Aboriginal peoples to be able to utilize ICT in their own languages, every effort should be made to reduce barriers and costs. Here ensuring the existence of a language identifier for each of the languages of Canada's First Nations and Aboriginal peoples is essential.

1.3.4 Link of "Language Identifiers" to "First Nations SchoolNet" and the Federal Government Initiatives

The federal government in launching its "First Nations SchoolNet" initiative did so with an emphasis on the integration of information and communications technologies (ICT) especially education. This has a result of placing a priority on ensuring that the linguistic requirements of First Nations (and by implication all of Canada's aboriginal peoples).

As such, one key issue here is whether or not internationally recognized language identifiers, i.e., in the form of ISO 639-2/T codes exist, for all the languages of Canada's First Nations and Aboriginal peoples. Without the assurance that such language codes exist here it is likely that there will be barriers and difficulties to those having an Aboriginal language in accessing and using ICT-based projects and services in their language.

Another context here is that of the federal government's focus on supporting general public access to and use of the Internet that serve communities of the greatest need ("digital divide communities"). Here the issue in the context of "digital divide communities" is that many of these involve First Nations and Aboriginal peoples and thus addressing the digital divide requires that the linguistic requirements of these peoples are identified and supported.

Further, the sharing and development of "e-learning resources" in any and all languages of Canada's First Nations peoples is a key objective of "First Nations SchoolNet". As such having a single comprehensive

set of language identifiers which incorporates and is representative of the user community of the names of all the languages of Canada's First Nations and Aboriginal peoples is a key requirement. This is required not only to identify the language(s) of the e-learning resources themselves but also that of associated metadata.

At present, information on what are the languages of Canada's First Nations and Aboriginal peoples in general exists in scattered form and is not definitive. Much of what is available represents the perspective of English or French speaking sources and not those of Canada's First Nations and Aboriginal peoples themselves. Further, Canada's First Nations and Aboriginal peoples make distinctions among languages which an outsider may consider to be a single language.

The principles and rules for the international standard ISO 639 have changed from a 1980 European centred approach of "major languages only" to one which is now open and inclusive. The fact that ICT barriers to the use of any language has since disappeared is one contributing factor here.

Another issue is that little is known about languages of instruction (present or planned) in the schools of Canada's First Nations and Aboriginal peoples.

1.4 PURPOSE AND OBJECTIVES OF THIS PROJECT

The purpose of this project is to develop an "initial draft strategy...". This part of the title was selected purposefully for several reasons; namely:

- ▶ recognition that this is a complex matter and although resolvable and implementable in a pragmatic manner, will require many steps;
- ▶ recognition that this is an activity which requires the involvement of Canada's First Nations and Aboriginal peoples as this involves decision-making processing in which they should be key stakeholders.

The purpose of this project is to "...support linguistic requirements of First Nations and Aboriginal peoples...". This part of the title was selected to make clear that the focus of this project is on "linguistic requirements" in recognition of the fact that there are other language issues, cultural aspects, etc., involved. But these are outside the scope of this project.

The objectives of this project are to:

- (1) identify, analyze and bring to the fore (in summary form) the international standardization perspective in the ability to be able to support and integrate the linguistic requirements of the language(s) of any community of people anywhere in the world.

Sub-objectives here include:

- (a) a synthesis of the ISO/IEC 10646 "Unicode" standard and its relevance to this project;
and,

- (b) an identification of a synthesis of the relevant principles and rules of ISO 639 for the identification and naming of languages as well as assignment of codes representing the names of languages.
- (2) summarize the requirements for the registration of a language and obtaining a language identifier, i.e., code, which is internationally recognized and thus capable of being integrated into ICT;
- (3) develop and present a framework and systematic approach to the identification of linguistic requirements of First Nations and Aboriginal peoples;
- (4) identify the "languages" of Canada's First Nations and Aboriginal peoples and their mapping to existing ISO 639-2/T language codes;
- (5) identify the languages of First Nations and Aboriginal peoples which may require the registration of internationally recognized language identifiers, i.e., as part of ISO 639-2/T;
- (6) identify some of the key issues to be resolved by Canada's indigenous peoples themselves with respect to what they consider their languages to be including the names of their language in their language as well as its equivalent transliteration using the Latin-1 alphabet.

The initial draft strategy developed here in support of First Nations linguistic requirements in their utilization of information, and communication technologies (ICT) with respect to metadata for learning resources is one which is of a horizontal nature. As such, it is anticipated that the draft strategy developed here for supporting First Nation linguistic requirement (written and oral) in support of international standards development for "metadata for learning resources" will be of a generic nature and thus applicable to most other First Nation requirements involving the use of ICTs in this context.

1.5 ASPECTS OUTSIDE THE SCOPE OF THIS PROJECT

1.5.1 Introduction

This is a small project with a very modest resource allocation. The authors of this report are very well aware of the wide and varied aspects of analysis of linguistic requirements let alone language policy and associated political considerations. These are outside of the scope of this project.

There are also a number of specific aspects not addressed in this project which pertain to this project and resulting report.

1.5.2 Decision on First Nation and Aboriginal Languages

The purpose of this project is the development of an initial draft strategy for supporting the linguistic requirements of First Nations and Aboriginal languages. It is outside the scope of this project to decide what the languages are of Canada's First Nations and Aboriginal peoples (and Métis).

This is a decision for each of Canada's First Nations and Aboriginal peoples to make. In this context this Report serves as input into some of the considerations to be taken into account when such a decision is made from an international standards perspective.

1.5.3 Decision on Naming of Languages

In this Report the English language names (at time French language names also) are used. One notes that these names of languages of the Canadian First Nations and Aboriginal peoples are not the names which they themselves use, i.e., the name of a language as assigned by the people of that language.

In addition, there are variant English language (and likely French language) names in existence for what may well be the same language, i.e., variants in spellings and/or representations.

{See further Chapter 2.3.3 below}.

1.5.4 Classification of Categories or Families of Languages

There are different approaches in linguistics (as well as in terminology, history, philology, anthropology, and related disciplines) to the classification of languages into categories or families. The authors of this Report are fully aware of the various theories and associated classification systems which are in use or being promoted¹⁵.

Dealing with systems for classification of languages is outside the scope and purpose of this Report. The structure of the "Working Matrix" in Chapter 3.3.6 below is based on that used by Statistics Canada. {See further Chapter 3.3.2 below}.

Other views exist on the classification of the languages of Canada's First Nations and Aboriginal peoples. However, choice of classification system does impact the naming of a language. And it should be noted that the number of variant names which exist for the languages of Canada's First Nations and Aboriginal peoples is due in part to the differing approaches to the classification of languages in use.

1.5.5 Individual Accessibility

There are public policy requirements of a constitutional, charter rights or regulatory nature of jurisdictional domain as rights of individuals. Included here are those of individual accessibility. This applies not only to the physical world, (e.g., wheelchair ramps), but also that of the virtual world of the Internet.

¹⁵There are basically two ways to classify a language, i.e., genetic classification and typological classification. The former classifies languages into families, based on descent from a common ancestor, while the latter organizes languages into types based on shared characteristics, (e.g., morphological structure, word order). [Note: Both methods are independent of one another]. One prime classifier of languages using genetic classification is SIL (producers of *Ethnologue*). Their classification system is based in large part on the 1992 Oxford University Press publication edited by William O. Bright titled *International Encyclopedia of Linguistics*. {See Grimes, B.F. (Ed.). *Ethnologue: Volume 2 Maps and Indexes*. (Introduction, p. v). Dallas, Texas: SIL International, 2000 (14th ed)}.

Individual accessibility pertains to rights of an individual with disabilities to be able to utilize IT systems at the human, i.e., user, interface and the concomitant obligation of those providing an ICT-based good or service, (e.g, a learning resource) to provide such adaptive technologies and content.

It is assumed that support of linguistic requirements of First Nations and Aboriginal peoples include those of individual accessibility, (e.g., use of Braille, sign language, etc.).

Our work on this project has taken note of linguistic requirements pertaining to individual accessibility even though addressing these requirements are outside the scope and purpose of this project. However, the draft strategy proposed in this Report is inclusive in nature and is architecturally designed to be able to incorporate and support requirements of this nature¹⁶.

1.5.6 Multicultural Policy and Heritage Languages

While Canada has a "multicultural" policy, it does not have a "multilingual" one, only an officially bilingual one. This is dependent on the nature of the historical development of Canada. However, Section 26 of the Charter pertains to "multicultural heritage". It states and we quote:

"This Charter shall be interpreted in a manner consistent with the preservation and enhancement of the multicultural heritage of Canadians".

A "heritage language" is thus any language that is relevant to the preservation and enhancement of the multicultural heritage of Canadians. For convenience and practical purposes we have labelled as "heritage language", any language in use by a community of people in Canada which is not already an "official language" or "legally recognized language (LRL)" in Canada. {See further Chapter 3.2 below}

In this context, the issues to be addressed and resolved with respect to the identification of linguistic requirements of Canada's First Nations and Aboriginal peoples will also benefit "the preservation and enhancement of multicultural heritage of Canada", and especially with respect to multilingual e-learning resources and associated metadata.

1.5.7 Unambiguous Identification and Interworking of Codes Representing Countries, Languages and Currencies

There are many applications which require the unambiguous identification and simultaneous interworking

¹⁶In support of ensuring that generic requirements of individual accessibility are included in international e-learning standards development work, Industry Canada, i.e., via ELMS, is sponsoring/funding Canada taking a lead role in launching a new multipart "AccessForAll" ISO/IEC standards development project through the Adaptive Technology Resource Centre (ATRC), University of Toronto with Prof. Jutta Treviranus as the Project Editor. The title of this NWIP (New Work Item Proposal) is to be "*Individual Adaptability and Accessibility in E-Learning, Education and Training*"

of two or more codes representing countries¹⁷, languages and/or currencies. This is an issue which has been identified at the international standards development level of the ISO and IEC, i.e., through its Joint Technical Committee for Information Technology (a.k.a., "ISO/IEC JTC1" or "JTC1")¹⁸.

Further, with respect to countries as jurisdictional domains, they themselves contain other levels of jurisdictional domains. For example, Canada as a jurisdictional domain includes ten (10) provinces and three (3) territories as jurisdictional domains. The issue here is one of how to combine ISO 3166-1 "country codes", ISO 3166-2 "administrative sub-division" codes, ISO 639 language codes, to identify Inuktitut as an official language of Nunavut as a territory of Canada¹⁹.

1.6 WORKING DEFINITIONS RELATED TO "ABORIGINAL PEOPLES" ("FIRST NATIONS", "MÉTIS", AND "INUIT")

The contract and thus title of this Report uses the phrase "First Nations and Aboriginal". Imbedded here are many different concepts and definitions. For the purpose of this project and in the context of its linguistic requirements focus, we are using as working definitions (English and French) those in use by the department of Indian and Northern Affairs Canada (INAC)²⁰; namely:

- ▶ Aboriginal peoples/Peuples autochtones
- ▶ Indian/Indiens
- ▶ Inuit/Inuit
- ▶ Métis/Métis
- ▶ First Nation/Première nation.

¹⁷Note: Both ISO 639-1:2001 and ISO 639-2:1998, in their Clause 4.4 "Application of the country code", allow for the combining of language codes and country codes as found in ISO 3166. This requirement appeared in the initial ISO 639 1988 standard also as Clause 4.4 "Application of the country symbols".

¹⁸The Canadian contribution in response to this international standardization issue is found in ISO/IEC JTC1 document N7335 titled *"Response to JTC1 Sophia Resolution #39: Development of a Solution for the Unambiguous Identification and Interworking of Codes Representing Countries, Languages, and Currencies (prepared on behalf of SC32/WG1)"*.

¹⁹The solution proposed here in ISO/IEC JTC1 document N7335 (cited above) as an example based on the official language of the Territory of Nunavut in Canada (see p. 16 in N7335) is:

- ▶ 124-nu:eng;
- ▶ 124-nu:fra;
- ▶ 124-nu:iku,

where "124" is the 3-alpha numeric digit ISO 3166-1 code for Canada, "nu" is the ISO 3166-2 administrative subdivision code for Nunavut in Canada, and "iku" is ISO 639-2/T 3-alpha code for Inuktitut. The delimiters ":" and "-" are stakeholder delimiters. This is an issue yet to be resolved by ISO/IEC JTC1.

²⁰See further Indian and North Affairs Canada (INAC)/Affaires indiennes et du Nord Canada (AINC)'s Information Sheets at <<<http://www.ainc-inac.gc.ca/pr/info/>>> as of 29 October, 2004. In particular, see the information sheet titled "Terminology" dated July 2003 found at <<http://www.ainc-inc.gc.ca/pr/info/tIn_e.html>>. The French language version titled « Terminologie » and dated juillet, 2003 is found at <<http://ainc-inac.gc.ca/pr/info/tIn_f.html>>.

Aboriginal peoples: *The descendants of the original inhabitants of North America. The Canadian constitution recognizes three groups of Aboriginal people - Indians, Métis and Inuit. These are three separate peoples with unique heritages, languages, cultural practices and spiritual beliefs.*

Peuples autochtones: *Les descendants des premiers habitants de l'Amérique du Nord. La constitution canadienne reconnaît trois peuples autochtones: les Indiens, les Métis et les Inuit. Il s'agit de trois peuples, chacun se distinguant des autres par son patrimoine, sa langue, ses habitudes culturelles et ses croyances.*

Indian: *Indian peoples are one of three groups of people recognized as Aboriginal in the Constitution Act, 1982. It specifies that Aboriginal people in Canada consist of Indians, Inuit and Métis. Indians in Canada are often referred to as "Status Indians, non-Status Indians and Treaty Indians.*

Indiens: *Les Indiens forment l'un des trois groupes de personnes appelées Autochtones dans la Loi constitutionnelle de 1982. LA Loi stipule que les Autochtones au Canada comprennent les Indiens, les Métis et les Inuit. On désigne souvent les Indiens au Canada comme étant des Indiens inscrits, des Indiens non inscrits et des Indiens visés par un traité.*

Inuit: *An Aboriginal people in Northern Canada, who live in Nunavut, Northwest Territories, Northern Quebec and Northern Labrador. The word means "people" in the Inuit language - Inuktitut. The singular of Inuit is Inuk.*

Inuit: *Autochtones du Nord canadien qui vivent au Nunavut, dans les Territoires du Nord-Ouest, dans le Nord du Québec et le Nord du Labrador. Dans la langue inuite, l'inuktitut, le mot signifie «les gens».*

Métis: *People of mixed First Nation and European ancestry who identify themselves as Métis, as distinct from First Nations people, Inuit or non-Aboriginal people. The Métis have a unique culture that draws on their diverse ancestral origins, such as Scottish, French, Ojibway and Cree.*

Métis: *Personnes d'ascendance mixte - qui possèdent des ancêtres européens et issus d'une Première nation - se désignant eux-mêmes comme Métis et se distinguant ainsi des membres des Premières nations, de Inuit et des non-autochtones. Les Métis possèdent une culture unique, inspirée de leurs origines ancestrales diverses, qui peuvent être écossaises, françaises, ojibways et cries.*

First Nation: *A term that came into common usage in the 1970s to replace the word "Indian", which some people found offensive. Although the term First Nation is widely used, no legal definition of it exists. Among its uses, the term "First Nations peoples" refers to the Indian peoples in Canada, both Status and non-Status. Some Indian peoples have also adopted the term "First Nation" to replace the work "band" in the name of their community.*

Première nation: Terme dont l'usage s'est répandu dans les années 1970 afin de remplacer le mot Indien, que certains trouvaient choquant. Bien que l'expression Première nation soit largement utilisée, il n'en existe aucune définition officielle. On emploie notamment l'expression gens des Première nations pour désigner les Indiens habitant au Canada, qu'ils possèdent ou non le statut d'Indien. Certains Indiens ont aussi opté pour le terme Première nation afin de remplacer le mot band dans le nom de leur collectivité.

We conclude by noting that Part II of "The Constitution Act, 1982" states in Section 35(2), and we quote:

"In this Act, "aboriginal peoples of Canada" includes the Indian, Inuit and Métis peoples of Canada".

As such, even though the original driver for this project is the context of the "First Nations SchoolNet" initiative, this initial draft strategy for support of linguistic requirements encompasses the scope of this definition of "Aboriginal peoples of Canada". This is because from a practical perspective and the need for pragmatic solutions, the issues to be addressed are the same.

2.0 APPROACH TO DEVELOPMENT OF A STRATEGY: KEY INTERNATIONAL CONSIDERATIONS

2.1 INTRODUCTION

The purpose of this section is to bring forward two key considerations which form part of the development of this initial draft strategy. One focuses on important developments in international standards development during the past few years, i.e., those of ISO/IEC 10646 and ISO 639. The other brings to the fore the fact that the linguistic requirements of Canada including those of its Aboriginal peoples, as well as its multicultural make-up, are representative of world-wide requirements. Consequently, the further development and implementation of the draft strategy presented in this Report can serve as a prototype and model for use by many other countries around the world.

2.2 ASPECTS OF A LANGUAGE: INTERNATIONAL STANDARDS PERSPECTIVE

2.2.1 Introduction

This section focuses on those aspects of a language from an international standardization perspective, and does so within this context those of particular relevance to the scope and purpose of this project.

2.2.2 What is a Language?

The ISO definition of "language" is provided in ISO 5217:2000 *Information and documentation - Vocabulary*. ISO 5217 is the responsibility of ISO TC 46 - *Information and documentation/Information et documentation*. ISO 5217 defines "language" as:

*language: system of signs for communication usually consisting of a vocabulary and rules. (1.1.2.01)*²¹

There are many types of languages. For the purposes of this project, we are not concerned with "special languages", "programming languages", "artificial languages", etc., but only with "natural languages".

ISO 5217 defines "natural language" as:

natural language: language which is or was in active use in a community of people, and the rules of which are mainly deduced from the usage. (1.1.2.02)

²¹The terms "sign", "communication", "sign" and "meaning" are also defined as:

sign: any physical phenomenon interpreted to convey meaning. (1.1.3.02)

communication: transfer of meaning by means of transmission of signals. (1.1.3.01)

meaning: interpretation of a concept associated with a sign. (1.1.3.04)

Natural languages which were or are in active use in "a community of people" are identified and enumerated in the multipart part ISO 639 standard. {see further below Chapter 2.3}

For the purpose of this project and this Report when the term "language" is utilized, it is with this international standard definition of "natural language".

2.2.3 Written and Oral Languages

A language of a "community of people" or a "people" can exist in oral form only or in oral and written form. With respect to written forms there are three widely used international alphabets namely:

- ▶ Roman;
- ▶ Arabic; and,
- ▶ Cyrillic.

In addition, there are also the non-alphabet writing systems, i.e., those called ideograms, (e.g., Chinese and Japanese). Further, there is a separate writing system, developed in isolation called "Hangul" which is utilized for the Korean language (and introduced in the mid 14th century). Based on the above, there are also circa 26 major writing scripts, (e.g., Hebrew, Greek, Bengali, Farsi, Thai, etc.)²².

On the whole, the languages in use among Canada's indigenous peoples are oral languages. The written form or forms were developed by Europeans arriving in Canada from the 16th century onwards. English and French missionaries, primarily Anglican, Roman Catholic, and Moravian, developed the written forms of the languages of Canada's indigenous peoples. Here both the Latin-1 alphabet and syllabic based representations were utilized.

Depending on which group of European missionaries developed the written form of the language of a Canadian First Nation or aboriginal peoples, the Latin-1 or syllabic form (or both) are in use today. In the 1950s onwards, the Canadian governments fostered the standardization of the written forms in use for the Inuit language (Inuktitut) including the development of vocabularies²³. {See further Chapter 3 below}

2.3 INTERNATIONAL STANDARDS DEVELOPMENT

2.3.1 Disappearance of Technical Barriers: ISO 10646

It was not that long ago that one was not able to utilize, let alone communicate, letters with diacritics in

²²See further, for example, Sacks, D. (2003). *Language visible. Unraveling the mystery of the alphabet from A to Z*. NY: Broadway Books, p. 2-3.

²³A key factor here was the start of the Cold War where the need to demonstrate sovereignty in the North and the construction of the Distant Early Warning (DEW) Line radar system led the Canadian government to foster "standardization" in the use of the language of Canada's northern peoples including the development of vocabularies and dictionaries.

both lower and upper case as required to support the use of the French language via ICT. This was a world-wide challenge and also applied to the ability of anyone to utilize any language anywhere in the world and communicate in that language with others.

The ISO/IEC successfully responded to this challenge in the development of the international standard ISO/IEC 10646-1:2000 *Information Technology -- Universal Multiple-Octet Coded Character Set (UCS) - Part 1: Architecture and Basis Multilingual Plane (a.k.a "Unicode") and its amendments up to Amendment 11:1997 Unified Canadian Aboriginal Syllabics, and the Unicode Standard Version 3.0.*

It is noted that Canada played and continues to play a significant, if not "lead role", in the development and updating of ISO/IEC 10646. Canada does this through both recognized individual experts as well as Canada-based entities of major private sector players.

The standard was updated in 2003. All the amendments made during the period were integrated and republished with its new and current title:

ISO/IEC 10646:2003 *Information technology - Universal Multiple-Octet Coded Character Set (UCS)*. The French language version whose title is « *Technologies de l'information - Jeu universel de caractères codés sur plusieurs octets (JUC)* » is in preparation and is expected to be released in 2005.

Commonly known as ISO/IEC "10646" or as "Unicode", this international standard has been designed to be able to support any script form of any written language in the world (past, present or future) as well as additional glyphs, symbols, etc., that may be required. "10646" is applicable to the representation, transmission, interchange, processing, storage, input, presentation, retrieval, etc., of any language.

A consultation with Canadian experts indicates that Canadian Aboriginal languages, i.e., those having Latin-1 script-based languages are reasonably supported as well as Canadian syllabic scripts being incorporated in the 2003 version of ISO/IEC 10646. However, **the detailed and systematic review needed to ensure 100% coverage in ISO/IEC 10646 for all the characters and syllabics (as well as possible glyphs) which are required to support all the linguistic requirements for all the languages of Canada's First Nations and Aboriginal peoples has not yet been undertaken.** Addressing and resolving this issue is directly related to the *a priori* resolution of "What are the languages of Canada's First Nations and Aboriginal peoples"?

ISO/IEC 10646 has a Clause 11 "Revision and updating of the UCS". This is carried out by the international standards committee ISO/IEC JTC1/SC2 - "Coded Character Sets". This means, that should any First Nation or Aboriginal peoples language (not yet registered via an ISO 639 language identifier) contain a character or symbol not yet registered in ISO/IEC 10646, procedures exist to do so. Given the fact that Canada has a recognized world-wide leadership role in the development and maintenance of ISO/IEC 10646, it should be possible to make such additions to ISO/IEC 10646, if required.

2.3.2 Approach taken by "ISO 639": Codes Representing Names of Languages

There is an international standard used world-wide since 1988 for providing sets of codes for the representation of names of languages. Devised originally for use in terminology, lexicography and linguistics, they have been adopted in many applications (including those which are IT or Internet-based)

requiring the expression of a language in a two-letter and now also three-letter alphabetic code form.

The original 1988 ISO 639 standard was a single standard consisting of 2-alpha code set. Focused on "major languages" only, it proved to be insufficient to cover "all" the languages in use. Further, advances in information technologies towards the end of the 1990s removed technical barriers to the ability of IT to be able to support the representation requirements of any language. {See further Chapter 2.3.1 above}

Consequently, the original 1988 single part was revised and ISO 639 standard has become a multipart standard whose current parts (and dates) are as follows:

- ▶ ISO 639-1:2001 (E/F) Codes for the representation of names of languages - Part 1: Alpha-2 code/Codes pour la représentation de noms de langues - Partie 1: Code alpha-2
- ▶ ISO 639-2:1998 (E/F) Codes for the representations of names of languages - Part 2: Alpha-3 code/Codes pour la représentation des noms de langue - Partie 2: Code alpha-3

Here the ISO 639-2:1998 alpha-3 code standard provides for two sets of language codes: one for the terminology applications known and referenced as ISO 639-2/T, and one for bibliographic applications, known and referenced as IS) 639-2/B. Here Canada through its participation in ISO/IEC JTC1/SC32 "Data Management and Interchange" successfully advocated the use of the ISO 639-2/T code set, i.e., in the SC32/WG1 "e-business" and SC32/WG2 "Metadata" standards²⁴.

Consequently, it is our recommendation {See further below Chapter 3} that one element of the strategy be that of using the ISO 639-2/T as the default code set for the identification and referencing of Canadian First Nation and Aboriginal languages.

Finally, international standards development work of ISO TC37 "Terminology" is under way to develop a new Part 3 titled ISO CD 639-3:2003 (E/F) *Codes for the representation of names of languages - Part 3: Alpha-3 code for comprehensive coverage of languages/Codes pour la représentation de noms de langues - Partie 3: Code alpha-3 pour un traitement exhaustif des langues*.

The Scope statement for this Part 3 includes the following statements:

"This part of ISO 639 provides a code consisting of language code elements comprising three-letter language identifiers for the representation of names of languages. The language identifiers according to this part of ISO 639 were devised for use in a wide range of applications, especially in computer systems, where there is potential need to support a large number of languages that are known to have ever existed"....

"... this part of ISO 639 attempts to provide a complete enumeration of languages, including

²⁴The primary reasons here included the fact that the ISO 639-2/B language code set is English language centred using the English language names to compose the language code instead of the name of the language in that language itself as the basis for the formulation of the language code. {See further the analysis of this issue prepared by the authors of this report as found in the document ... Need for a Default Convention .. and ISO/IEC JTC1 document N7335 titled "Response to JTC1 Sophia Resolution #39: Development of a Solution for the Unambiguous Identification and Interworking of Codes Representing Countries, Languages, and Currencies (prepared on behalf of SC32/WG1)".}

living, extinct, ancient and constructed languages, whether major or minor. As a result, this part of ISO 639 lists a very large number of lesser-known languages. Languages designated exclusively for machine use, such as computer-programming languages, and reconstructed languages are not included in this code".

It will take some time for this new Part 3 to be developed and go through various stages and ballots. Consequently, ISO 639-2/T remains the (most useful and stable) referenced international standard for language codes and is thus utilized in various tables and matrices.

2.3.3 Names of Languages: "ISO English", "ISO French", "Indigenous", "Reference"

Each of the three parts of ISO 639 has variances in the spelling and/or representation²⁵ of the names of a language in its tables as well as codes. (These are presented in Chapter 2.3.4 below) All of them include the ISO English and ISO French names of a language²⁶.

ISO 639-1 includes in its table the indigenous²⁷ name(s) of the language or the preference of the communities using the language. These have been included in the table below which takes those relevant to this project and provides both the 2-alpha and 3-alpha ISO 639 code for the languages noted.

From a North American indigenous peoples perspective, examples include:

ISO 639 Names of Languages			Language Identifier	
ISO English	ISO French	Indigenous Name(s)	ISO 639-1	ISO 639-2/T
Ojibwa	ojibwa	chippewa; ojibwe	oj	oji
Navajo; Navaho	navaho	diné bizaad	nv	nav
Cree	cree	nêhiyawa	cr	cre
Chichewa; Chewa; Nyanja	chichewa; chewa; nyanja	tshichewa; tshinyanja	ny	chp

Note too that ISO 639-1 includes variant spellings of the ISO English, ISO French and Indigenous names. **This issue of spelling of the names of languages as decided upon by Canada's Aboriginal peoples themselves, will have to be accommodated in any strategy along with the larger issue of the names**

²⁵By representation, we mean the use of diacritics, spacing (as a single or more than one character string for the name of the language as a "term"), etc.

²⁶The use of "ISO English" and "ISO French" merely reflects the fact that there are variant spellings (and/or presentations) of the names of languages in English and French. ISO English and ISO French here refers to that used in these ISO standards.

²⁷All indigenous names are presented using the Latin-1 alphabet. This means that many have been "transliterated". However, ISO 639-1 does not provide a definition for "indigenous name".

of languages.

[Note: This means that it is up to each of Canada's Aboriginal peoples to decide what the indigenous name of their language is].

The experience here of the Union of South Africa provides a useful example. The replacement of its "apartheid" regime led to the development of a constitution which includes the identification of its official languages, eleven (11) in all, at both the federal and provincial levels of its jurisdictional domains²⁸.

Extending the above example from ISO 639-1 to the official languages of South Africa, we have the following:

ISO 639 Names of Languages			Language Identifier	
ISO English	ISO French	Indigenous Name	ISO 639-1	ISO 639-2/T
South Ndebele	ndébélé du Sud	isiNdebele ²⁹	nr	nbl
Xhosa	xhosa	isiXhosa	xh	xho
Zulu	zoulou	isiZulu	zu	zul
Siswati; Swazi; Swati	swazi; swati; siswati	siSwati	ss	ssw
Northern Sotho; Pedi ³⁰	sotho du Nord	Sepedi	??	nso
Sesotho; Southern Sotho	sesotho; sotho du Sud	Sesotho	st	sot
Setswana; Tswana	setchwana; tswana	Setswana	tn	tsn
Venda	venda	Tshivenda	ve	ven
Tsonga	tsonga	Xitsonga	ts	tso
English	anglais	English	en	eng
Afrikaans	afrikaans	Afrikaans	af	afr

{See further Annex B and its matrix of South Africa's levels of jurisdictional domains and their official languages}.

²⁸For a very useful analysis and insights into the factors leading to the development of the official language framework (including legislation and policies) of South Africa's multilingual language policies, see the paper by M.J. Pereira titled "A Case Study of South African Language Policy and Planning: The Vision versus the Reality and Some Next Steps". August, 2001, 26 p.

²⁹Note: Northern and Southern Ndebele are different languages. Southern Ndebele is used in South Africa. Northern Ndebele is used primarily in Zimbabwe (where it is also known as Tabele, isiNdbe'ele, siNdebele).

³⁰Note: Pedi (Northern Sotho) is not found in ISO 639-1:1998.

2.3.4 Matrix of Codes and Names of Languages in ISO 639-1, 2 and 3

ISO 639-2 consists of ISO English and ISO French names only along with two sets of 3-alpha codes. It also includes identifiers for "collections" of languages as does ISO 639-1.

ISO 639-3 has "reference names" as used by the Summer Institute of Linguistics Inc. (SIL) many of the entries include both the name of the language followed by the name of the geopolitical entity of the community of people.

The type of codes and "names" in ISO 639-1, -2 and -3 is summarized in the matrix below.

	ISO 639		
	Part 1	Part 2	Part 3
2-alpha code	x		
3-alpha code - Terminology		x	x
3-alpha code - Bibliographic		x	
ISO English name	x	x	
ISO French name	x	x	
Indigenous name(s)	x		
Reference name(s)			x

The Committee Draft (CD) for Part 3 in the following "Note" (p. v) states:

"The exact relationship between part 1 and part 2 depends on how the definition of existing langids (= language identifiers) vis-à-vis part 3 gets resolved".

The current interworking of these three parts of ISO 639 is as follows:

- ▶ all languages identified in Part 1 are also found in Parts 2 and 3. Part 1 was deemed primarily for use in terminology, lexicography and linguistics;
- ▶ Part 2 represents all languages contained in Part 1 and in addition other languages and language groups of interest to primary applications in terminology and bibliography;
- ▶ Part 3 is being devised *"to provide a comprehensive collection of identifiers for all languages for use in a wide range of applications, including linguistics, lexicography and internationalisation of information systems. It attempts to represent all known languages"* (as per Introduction in ISO/CD 639-3).

The 3-letter codes in ISO 639-2 and ISO 639-3 are complementary and compatible. ISO 639-3 uses the ISO 639-2/T (Terminology) set of 3-alpha codes.

- ▶ The languages listed in ISO 639-1 in effect are a sub-set of ISO 639-2 and ISO 639-3. Every 2-alpha code in ISO 639-1 has a corresponding language code element in ISO 639-2 and ISO 639-3 but not necessarily vice-versa. ISO 639-3 thus serves as a consolidated list of languages found in Parts 1 and 2.

In conclusion:

- (1) New 3-alpha codes are needed to ensure that the languages of Canada's First Nations and Aboriginal peoples are supported, i.e., by adding the required "missing" language identifiers to ISO 639-2/T³¹.
- (2) In making an application for the addition of a new ISO 639-2/T language identifier as a code for representing a language of Canada's First Nations and Aboriginal peoples, the following information should be provided as part of such an application for a language identifier, i.e., code:
 - (a) the name of the language in the language of the specific Canadian First Nation or Aboriginal people as decided by the "people" concerned, i.e., as its "indigenous name";
 - (b) the "official" Latin-1 transliteration where (a) utilizes a non-Latin-1 character set;
 - (c) the recommended 3-alpha code for the language identifier based on (a) and/or (b)³²;
 - (d) based on (a) or (b) above:
 - ▶ the recommended ISO English name;
 - ▶ the recommended ISO French name;
 - (f) any other reference names, i.e., existing/known "a.k.a." (= also known as) names of that language.

The overall thrust of the draft strategy is that it should be the concerned First Nation or Aboriginal people itself which decides on "(a)" through "(f)" above. Other parties may provide advice, expertise, guidance, options, etc., but the ultimate decision here should be that of the First Nation or Aboriginal people itself.

Of course, all the mandatory registration requirements of ISO 639-2/T for application of a language identifier and registration of a language will also need to be met.

2.3.5 Current Registration Requirements for Adding to ISO 639 Language and 3-Alpha Language Codes

³¹It is possible to also apply for a 2-alpha ISO 639-1 code but the number of available codes is limited. One may well end up with a 2-alpha code which has little or no relation to the name of the language being registered.

³²Here it would be prudent to have at least one possible alternate 3-alpha code.

Both ISO 639-1 and -2 make provision for the addition of language identifiers representing names of languages not yet included, their registration and subsequent assignment of either a two letter (Part 1) or three-letter (Part 2) language code. Each has a Registration Authority which not only registers new languages but also handles changes to existing language codes.

The registration requirements of ISO 639-1 and ISO 639-2 are stated in each part in its "Annex A (Normative) Procedures for the Registration Authority and Registration Authorities Advisory Committee ISO 639" (as well as in sub-clauses of Clause 4 in both parts). Though some differences exist among Part 1 and Part 2, on the whole, they are similar and for the purposes of this Report can be summarized as follows:

- ▶ one needs a supporting recommendation and support of an authority, (e.g., standards organization (of a country), a government body, linguistic institution, or cultural organization) as the requirement for making a written application are quite straightforward.
- ▶ everyone is free to apply for or propose a language to be coded, i.e., request the assignment and registration of a language identifier for that language;
- ▶ one should have written documents in the language as suitable documentary evidence. For ISO 639-2, there should be at least fifty (50) written documents;
- ▶ the decision on the choice of the 3-alpha code to be assigned to a language is based on a number of factors including that:
 - it cannot be one already in use (or one which has been in use during the past 10 years after being deprecated);
 - one of the combinations of three-alpha codes put forward by the applicant, (e.g., the community of people concerned).
- ▶ request for additions/deletions or changes of language codes shall be supported by a justification.

2.3.6 Separate Language Codes for Different Written Forms of the "Same" Spoken Language

It is stated in Section 3.3.3 below, that there are two official written forms of the Inuktitut language, i.e., one which is Latin-1 character based and one which is syllabic based. Our analysis of registration activity of new languages and assignment of 3-alpha codes, as "language identifiers" under ISO 639-2/T during the past three years has revealed that as of 2002-02-18, two language codes were added for Norwegian, i.e., in addition to the existing "nor" code. It appears that these additions reflect the fact that Norway has adopted two official "distinct" written language forms for Norwegian; namely: (a) Norwegian Nynorsk (ISO 639-2/T code = "nno"), and, (b) Norwegian Bokmål (ISO 639-2/T code = nob).

The Territory of Nunavut appears to be facing a similar situation in that it has two languages namely "Inuktitut" and "Inuinnaqtun". The former written in syllabics and the second written in Latin-1. The second is in a minority position vis-à-vis the first. Further, there appears to be a demarcation of the geographic nature in that Inuktitut is the predominant while Inuinnaqtun is spoken primarily in the

Kitikmeot Region of Nunavut (also referred to as the central Arctic).

The current language code in ISO 639-2/T which appears to be applicable is that of "iku" = Inuktitut - the predominant form.

It is important to determine and for the government of Nunavut to decide, whether it wishes to use "iku" to identify both writing forms or whether it wishes to have a separate language identified each for:

- (1) Inuktitut; and,
- (2) Inuinnaqtun³³.

If Nunavut decides that it needs two separate language identifiers, i.e., ISO 639-2/T based codes for each written form, then one can apply for registration of the same using the example of Norway as a precedent.

2.4 FIRST NATION/ABORIGINAL REQUIREMENTS: A SUB-SET OF CANADA-WIDE AND WORLD-WIDE REQUIREMENTS

Apart from Canada's own multicultural make-up and use of associated languages across Canada, there are many UN-member states having two or more official languages. {See Chapter 2.4.1 below}. Together they account for well over more than 1/3 of the world's population. In addition, in many countries there are added official languages at the sub-national level, (e.g., provinces, states, länder, etc.). Here in Canada, Inuktitut is an official language in Nunavut.

As such, the development of a systematic and inclusive approach to incorporating the linguistic requirements of at the minimum Canada's First Nations, and recommended all of Canada's Aboriginal peoples, into First Nations SchoolNet will create the opportunity for SchoolNet and its related IT infrastructure, architectural and structural design from a multilingual content and use perspective be able to serve as a prototype for use in many other places in the world which do have similar requirements.

2.4.1 UN-Member States Having Two or More Official Languages

Work is under way in the area of eBusiness standards development from a legal requirements perspective. Canada is taking the lead here through providing the Project Editors (Dr. Jake V.Th. Knoppers and David Clemis) and M. Janice Pereira making significant contributions with respect to language requirements. This project and thus this Report benefits from this work. The following two tables are based on this work³⁴.

³³The decision whether or not to incorporate another variety of Inuktitut, i.e., Inuvialuktun, which is spoken in the Mackenzie River delta of the Northwest Territories and is included in the NWT's Official Languages Act, is, as with Nunavut, for the NWT government to decide.

³⁴Based on Annex C (Normative) Codes Representing UN Member States and Their Official (or "de facto") Languages as found in ISO/IEC JTC1/SC32 document 32N1080 titled "*ISO/IEC CD ISO/IEC 15944-5 Information technology - Business agreement semantic descriptive techniques - Part 5: Identification and mapping of various categories of jurisdictional domains as external constraints.*", 2004-1-29 available via <<www.jtc1sc32.org>>

1. List of UN Member States Having Two Official Languages

Afghanistan ³⁵	Mauritania
Burundi	Mauritius
Cameroon	Moldova
Canada	Netherlands
Sri Lanka	New Zealand
Chad	Marshall Islands
Comoros	Palau
Cyprus	Pakistan
Equatorial Guinea	Paraguay
Finland	Peru
Djibouti	Philippines
Haiti	Samoa
Kenya	Seychelles
Kyrgyzstan	Swaziland
Madagascar	Tanzania
Malawi	Timor-Leste
Maldives	Tonga
Malta	Tuvalu

2. List of UN Member States Having Three or More Official Languages

Belgium	Vanuatu
Bolivia	Papua New Guinea
Bosnia Herzegovina	Rwanda
Ethiopia	Singapore
Eritrea	South Africa
India	Switzerland
Libya	Turkmenistan
Luxembourg	Uzbekistan

3.0 SOURCES OF LINGUISTIC REQUIREMENTS OF FIRST NATIONS AND ABORIGINAL

³⁵Note: The order of this list is based on the above mentioned Annex C which is presented in the order of ISO 3166-1 3-digit numeric code. This means that the list may not be in alphabetical order. This also applies to the Table in A.2 below.

PEOPLES

3.1 INTRODUCTION

This chapter identifies some key sources of linguistic requirements of First Nations and Aboriginal peoples. The nature of each source of requirements is introduced and some examples are provided. Even though the information provided and analyses undertaken are of a preliminary nature, it is sufficient to serve as a foundation for the development of the initial draft strategy.

3.2 DEFICIENCIES IN CURRENT APPROACH TO IDENTIFICATION AND NAMING OF LANGUAGES OF CANADA'S FIRST NATIONS AND ABORIGINAL PEOPLES

There does not exist a single authoritative source identifying and enumerating of all the languages of Canada's First Nations and Aboriginal peoples. There are several reasons for this (not mutually exclusive) including:

- ▶ the constitutional enactments from the Charter of the Hudson's Bay Company (1670) through the Constitution Act 1982 (and onwards) did not explicitly recognize such people and their languages in a specifiable manner;
- ▶ that the development of Canada's Official Languages Act focused on including French in addition to English;
- ▶ variant names exist for the same languages;
- ▶ the fact that at times names of languages are treated/used as nouns and in another context as adjectives. As such, in many natural languages, the representation of a name of a language is subject to rules covering concords, namely their gender and plurals;
- ▶ languages are identified in laws and regulations (of jurisdictional domains in Canada) but whose names are not the same as those found in ISO 639-1 or -2 and/or for which it has not been ascertained whether this is a variant spelling of the name of an existing language or a specific (other) language is intended; and,
- ▶ **finally and most important is that Canada's First Nations and Aboriginal peoples have not gone through (or undertaken) a systematic effort and decision-making process ("controlled" by them) to identify and ascertain what:**
 - (a) their languages are; and,
 - (b) the name by which they want that language to be designated and known in a consistent and on-going manner (irrespective of what its equivalent ISO English and ISO French language names may be).

3.3 (POTENTIAL) LINGUISTIC REQUIREMENTS

3.3.1 Introduction

Part II of "The Constitution Act" (1982) of Canada pertains to the "Rights of the "Aboriginal Peoples of Canada". The Canadian Constitution defines Aboriginal peoples of Canada as including "*the Indian, Inuit and Métis peoples of Canada*".

Part II, in Section 35(1), also states that "*the existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed*".

It is outside the scope of this project to analyze and identify the overall application of Part II of Canada's Constitution Act as it applies to the linguistic requirements of Canada's aboriginal peoples. We can however, start to outline the elements of a systematic process for (1) the identification of the linguistic requirements of Canada's Aboriginal peoples; (2) ensure that these are recognized and supported in international standards; and (3) bring these forward in e-learning standards for metadata for e-learning resources.

The sections which follow identify key elements for such a systematic process for the identification of the linguistic requirements of Canada's Aboriginal peoples including its First Nations. For each of these key elements, we have undertaken the initial work, present the initial results and provide direction for more thorough systematic analysis yet to be undertaken.

3.3.2 Based on Statistics Canada (and Related Data)

Various sources of information exist with respect to "what" are the languages of Canada's indigenous peoples including the various perspectives of Canada's First Nations, Aboriginal peoples, etc. In addition, there are legal, anthropological, linguistic and other perspectives.

The Report of the Royal Commission on Aboriginal Peoples (RCAP) (1996)³⁶ provided a perspective. Statistics Canada provides another perspective based on its surveys and census data³⁷.

There is also the two volume publication (now in its 14th edition) titled "Ethnologue. Languages of the World"³⁸.

Each of the above sources provide different identifications, enumerations and/or categories of languages of Canada's indigenous peoples.

³⁶Available via <<www.ainc-inac.gc.ca/ch/rcap/sg/cg_e.html>>

³⁷See for example the 2001 Census, or the 1991 StatsCan survey on Aboriginal Peoples. It contains an appendix titled "Aboriginal Languages Spoken", currently numbering 39 (as found in Language, Tradition, Health, Lifestyle and Social Issues. 1991 Aboriginal Peoples Survey. June, 1993, 248 p. Catalogue 89-533), as well as the list of 54 Canadian Aboriginal languages arranged by language family and sub-divided by member languages (as found in Indians and Inuit of Canada, 1990, p.11, Catalogue No. R32-971990). These two sources are the key inputs into the "working matrix" presented in Chapter 3.3.6 below.

³⁸Grimes, B.F. Ethnologue. Dallas, TX: SIL International. See also <<<http://ethnologue.com>>>

It is outside the scope of this project to reconcile these different perspectives. We were, however, able to prepare a "working" matrix of the "languages of Canada's First Nations, Aboriginal peoples, etc." The results are presented in Chapter 3.6 below.

3.3.3 Based on Official Language Requirements

On the whole any individual is free to choose the use of any language (registered in ISO 639 or not) orally or in written form, using ICT (including the Internet). This is also recognized by the Charter of the United Nations (Article 19) and elsewhere. As stated in Chapter 2.3.1 technical barriers to the use of any language have all but disappeared,

However, from a government perspective the number of languages in which it works as an organization and in which it communicates with its citizens, (e.g., administration of justice) is limited. The converse is the designation of a language(s) in which citizens have the right to receive services and communicate with a public administration. Where such languages are specified and prescribed they are known as an "official language"³⁹. Where a jurisdictional domain has no "official language" those languages which

³⁹The current draft international definition for "official language" is as taken from ISO/IEC CD 15944-5:200n is presented below. [It is likely that this draft definition will be shortened]:

official language: an external constraint in the form of a natural language specified by a jurisdictional domain for official use by Persons forming part of and/or subject to that jurisdictional domain for use in communication(s) either (1) within that jurisdictional domain; and/or, (2) among such Persons, where such communications are recorded information involving commitment(s).

NOTE 1 Unless official language requirements state otherwise, Persons are free to choose their mutually acceptable natural language and/or special language for communications as well as exchange of commitments.

NOTE 2 An official language(s) can be mandated for formal communications as well as provision of goods and services to Persons subject to that jurisdictional domain and for use in the legal and other conflict resolution system(s) of that jurisdictional domain, etc.

NOTE 3 Where applicable, use of an official language may be required in the exercise of rights and obligations of individuals in that jurisdictional domain.

NOTE 4 Where an official language of a jurisdictional domain has a controlled vocabulary of the nature of a terminology, it may well have the characteristics of a special language. In such cases, the terminology to be used must be specified.

NOTE 5 For an official language, the writing system(s) to be used shall be specified, where the spoken use of a natural language has more than one writing system.

EXAMPLE The spoken language of use of an official language may at times have more than one writing system. For example, two writing systems exist for the Inuktitut language, namely, one Latin-1 based (Roman), the other syllabic-based. Another example is that of Norway which has two official writing systems both Latin-1 based namely "Bokmål (Dano-Norwegian) and Nynorsk (New Norwegian).

NOTE 6 A jurisdictional domain may have more than one official language but these may or may not have equal status.

have a custom and long term use they are known as "de facto languages"⁴⁰

Various "official languages" exist in Canada at different levels of jurisdictional domains. In addition to English and French being official languages of the federal government of Canada, other languages have official language status at the provincial/territorial levels.

For example:

1. official languages of Nunavut

While Nunavut inherited the Official Language Act of the NWT, since Nunavut's creation in 1999, activities have been on-going on creating a unique made in Nunavut OLA. The background and current status is the following.

1. Nunavut is a creation of the federal government and the official languages are found in the Nunavut Act. Sections 23.(1)(n); 29.1; and, 38 are the relevant ones. Section 23.(1) gives the Legislature of Nunavut to "... promote Inuktitut". Section 29.1 states that the laws of the NWT which Nunavut inherited are still valid law, including the Official Languages Act of the NWT; and, Section 38 states that the Nunavut legislature cannot repeal etc., these laws⁴¹.

EXAMPLE Canada has two official languages, Switzerland has three, while the Union of South Africa has eleven official languages.

NOTE 7 The BOV requirement of the use of a specified language will place that requirement on any FSV supporting service.

EXAMPLE A BOV requirement of Arabic, Chinese, Russian, Japanese, Korean, etc., as an official language requires the FSV support service to be able to handle the associated character sets.

⁴⁰The draft international standard definition for "de facto language" also taken from ISO/IEC CD 15944-5:200n:

de facto language: a natural language used in a jurisdictional domain which has the properties and behaviours of an official language in that jurisdictional domain without having formally been declared as such by that jurisdictional domain.

NOTE 1 A de facto language of a jurisdictional domain is often established through long term use and custom.

NOTE 2 Unless explicitly stated otherwise and for the purposes of modelling a business transaction through scenario(s), scenario attributes and/or scenario components, a de facto language of a jurisdictional domain is assumed to have the same properties and behaviours of an official language.

⁴¹Nunavut Act (1993, c.28) <http://laws.justice.gc.ca/en/N-28.6/text.html> (as of 2003-08-06)

1. Section 23.(1)(n)

Subject to any other Act of Parliament, the Legislature may make laws in relation to the following classes of subjects;

(n) the preservation, use and promotion of the Inuktitut language, to the extent that the laws do not diminish the legal status of, or any rights in respect of, the English and French languages.

2. Nunavut's Official Languages Act - the one currently on the statute books, is the old NWT Official Languages Act. It (under section 4) lists several languages which are not spoken in Nunavut, (e.g., Chipewyan, Cree, Dogrib, English, French, Gwich'in, and Slavey), as well as Inuktitut which is spoken in both the NWT and Nunavut⁴². [Note: all of these languages have ISO 639-2/T codes namely: "chp", "cre", "dgr", "eng", "fra", "gwi", "den", "iku", respectively].
3. The Official Languages Act (section 1) defines "Inuktitut" to include Inuvialuktun and Inuinnaqtun⁴³
4. Inuvialuktun is not spoken in Nunavut (only NWT).
5. Since 1999 the review of the Official Languages Act has been the responsibility of the Special Committee to Review the Official Languages Act. The committee submitted its Final Report in Dec. 2003. Recommendations B.1 and B.5 of this Final Report are of importance re: Inuktitut. B.1 recommends a new Official Languages Act (to replace the one on the statute books) and B.5 provides the list of official languages, i.e., English, French, Inuktitut and Inuinnaqtun⁴⁴.

2. Section 29.1

The coming into force of section 3 does not affect a right, privilege, license, permit, authorization, approval, certification, registration or filing, or any status provided, before the day that section 3 comes into force, by or under the ordinances of the Northwest Territories. On or after that day, to the extent that it was in force or had effect and applied immediately before that day in relation to Nunavut, it is deemed, in relation to Nunavut, to have been provided by or under the laws of the Legislature.

3. Section 38

The law of the Legislature that, under subsection 29(1), is the duplicate of the ordinance of the Northwest Territories entitled the Official Languages Act may not be repealed, amended or otherwise rendered inoperable by the Legislature without the concurrence of Parliament by way of a resolution, if that repeal, amendment or measure that otherwise renders that law inoperable would have the effect of diminishing the rights and services provided for in that ordinance as enacted on June 28, 1984 and amended on June 26, 1986.

⁴²Official Languages Act as duplicated for Nunavut by s.29 of the Nunavut Act, R.S.N.W.T. 1988, c-O-1. http://www.nunavutcourtofjustice.ca/library/consol-stat/1999_CSNu_139_Official_Languages.pdf (as of 2004-04-16)

⁴³Section 4 - Chipewyan, Cree, Dogrib, English, French, Gwich'in, Inuktitut and Slavey are the Official Languages of the Territories.

Section 1 - Definitions

"Inuktitut" includes Inuvialuktun and Inuinnaqtun.

⁴⁴Special Committee to Review the Official Languages Act

Final Report (December, 2003) http://www.assembly.nu.ca/english/committees/languages/final_eng.pdf (as of 2004-03-17)

Recommendation B1:

That the current Official Languages Act be repealed and a "new" Official Languages Act be introduced reflecting the findings and recommendations of the Special Committee to Review the Official Languages Act

[Note: The debate has been over whether or not Inuinnaqtun is a dialect or a language. The decision is that it is a language. It uses our script and not the syllabic script which Inuktitut does, and it is in a minor position vis-à-vis Inuktitut, but it is being supported officially by the territorial government, (e.g., translation of official documents).]

2. Official Languages in the NWT

The official languages of the NWT are found in Section 4 of its Official Languages Act. They are: Chipewyan, Cree, Dogrib, English, French, Gwich'in, and Slavey, as well as Inuktitut.⁴⁵

3. Yukon

The Aboriginal Language Services of the Executive Council Office of the Yukon Government (http://www.gov.ca/services/abc/aboriginal_languages.html) is responsible for "preserving and enhancing aboriginal languages throughout the Yukon"⁴⁶. In a profile of Yukon First Nation Languages published in May, 2004 and titled "*Sharing the Gift of Language. Profile of Yukon First Nation Languages. We are our Language*"⁴⁷ identifies eight (8) First Nation languages language groups (with many dialects); namely:

- ▶ Gwich'in⁴⁸
- ▶ Hän
- ▶ Kaska
- ▶ Northern Tutchone
- ▶ Southern Tutchone
- ▶ Tagish
- ▶ Tlingit
- ▶ Upper Tanana

Gwich'in and Tlingit are the only two language groups with ISO 639-2/T codes, i.e., "gwi" and "tli" respectively.

Recommendation B5:

That the Act designate English, French, Inuktitut and Inuinnaqtun as the Official Languages of Nunavut.

⁴⁵Official Languages Act as duplicated for Nunavut by s.29 of the Nunavut Act, R.S.N.W.T. 1988, c-O-1. http://www.nunavutcourtofjustice.ca/library/consol-stat/1999_CSNU_139_Official_Languages.pdf (as of 2004-04-16)

⁴⁶See also below Chapter 4.2 "User Requirements"

⁴⁷{see http://www.gov.yk.ca/dcepts/eco/ablangsvcs/profile_of_yukon_first_nation_languages.pdf}

⁴⁸Gwich'in is also known as Kutchin or Loucheux.

In summary, in Canada's three territories where there are a majority of First Nations and Aboriginal peoples languages, which are protected, include:

- ▶ Nunavut with Inuktitut (including Inuinnaqtun)
- ▶ NWT with Inuktitut (including Inuvialuktun and Inuinnaqtun); Chipewyan, Cree, Dogrib, Gwich'in and Slavey; and,
- ▶ Yukon with Gwich'in; Hän; Kaska; Northern Tutchone; Southern Tutchone; Tagish; Tlingit; Upper Tanana

Of these only the following seven (7) have ISO 639-2/T language identifiers as follows:

Name of Language	ISO 639-2/T Language Identifier
Inuktitut (<u>not</u> Inuinnaqtun or Inuvialuktun)	iku
Chipewyan	chp
Cree	cre
Dogrib	dgr
Gwich'in	gwi
Slavey	den
Tlingit	tli

The following six (6) thus have no codes and obtaining an ISO 639-2/T registered language code should, at a minimum, be a key priority.

- ▶ Hän
- ▶ Kaska
- ▶ Northern Tutchone
- ▶ Southern Tutchone
- ▶ Tagish
- ▶ Upper Tanana.

3.3.4 Based on Identified Legally Recognized Language (LRL) Requirements - Generic and Specific

Apart from "official language acts", there exist other acts, regulations, legal instruments, etc., which contain linguistic requirements other than those already identified as an "official language" in that jurisdictional domain, i.e., these are languages which have legal recognition in a specific context.

These include the right of a Canadian Aboriginal people to use a specific language or be served in a language for the purposes of that Act, regulation, etc. Added here are self-governing agreements, land settlements, court decisions, etc.

The proposed draft definition of legally recognized language (LRL)⁴⁹ is as follows:

legally recognized language (LRL): a natural language which has status (other than an official language or de facto language) in a jurisdictional domain as stated in an act, regulation, or other legal instrument, which grants a community of people (or its individuals) the right to use that natural language in the context stipulated by the legal instrument(s).

NOTE The LRL can be specified through either:

- ▶ the identification of a language by the name utilized; or,
- ▶ the identification of a people and thus their language(s).

EXAMPLE In addition to acts and regulations, legal instruments include self-government agreements, land claim settlements, court decisions, jurisprudence, etc.

Linguistic requirements of a LRL nature exist for Canada's First Nations and Aboriginal peoples. The limited resources of this project did not permit for a detailed analysis. However, the initial investigation already identified numerous examples of such LRL requirements. These preliminary findings lead us to make the following observations and (initial) conclusions.

- (1) Linguistic requirements of Canada's First Nations and Aboriginal peoples of an LRL nature are significant.
- (2) Current LRL requirements of Canada's First Nations and Aboriginal peoples should not be addressed on an ad-hoc basis (current situation) but in an integrated and systematic basis. Not only is such an approach much more cost effective in the long term, it also facilitates the implementation of linguistic rights/obligation aspects of "land claim agreements", "self-government agreements", etc.

Some examples of sources of LRLs already identified across Canada in its provinces and territories include:

- ▶ **Nova Scotia**
Mi'kmaq Education Act
- ▶ **Quebec**
The Education Act for Cree, Inuit, and Naskapi Native Persons
- ▶ **Saskatchewan**

⁴⁹See further Clause 6.2.8 "Legally Recognized Languages (LRL)" in the ISO/IEC 15944-5 2nd CD ballot document, i.e., JTC1/SC32/WG1 N0282}.

The Métis Act

▶ **British Columbia**

First Peoples' Heritage Language and Culture Act

▶ **Northwest Territories**

Education Act (which states in section 7c(1) that the language of instruction must be an official language. There are eleven official languages of NWT).

▶ **Yukon**

First Nations (Yukon) Self-Government Act

Various Self Government Agreements including those with:

- Teslin Tlingit Council
- Nacho Nyak Dun
- Vuntut Gwitchin
- Little Salmon/Carnacks First Nation
- Tr'ondek Hwech'in First Nation

One could also find similar examples at the federal level. For example, under the Canadian Environmental Assessment Act (CEAA), recorded information (oral or written) as documents (irrespective of the media of recording) form part of the documents of each environmental assessment (EA) project⁵⁰

3.3.5 Based on Present (or Intended) User Requirements

It is recognized that for a number of Canada's Aboriginal languages, including those of First Nations, there remain a limited number of people for whom this language is a living language and that such a language may well be categorized by others (and their criteria) as an "endangered language".

Further, and more importantly, for a language to remain a viable language, it needs to be passed on from one generation to the next. As such it is vital for the continuance of a language that it be a language of instruction in schools (and then past the 4th grade).

Here the development and ability to share learning resources in any language facilitated through the use of ICT, (e.g., in the form of e-learning resources) play a crucial role. This is a major underlying premise and justification of the First Nations SchoolNet initiative (although not stated as explicitly as the authors

⁵⁰The CEAA is scheduled for a comprehensive review. For the implementation requirement of the CEAA when first introduced, see the December, 1993 report by INFOMAN Inc. titled "*Environment Assessment Public Registry Business and Operational Requirements. Functional Specifications and Data Matrix. (Level 2 Data Elements Only)*". For the overall requirements of the CEAA, see the multipart November 1993 report by INFOMAN Inc. titled "*Federal Environmental Assessment Index (FEAI). Business and Operational Requirements for an EDI-based Implementation*".

of this report, and others, would have liked to have seen stated).

It is noted that in conjunction with its Canadian learning partners, Industry Canada's SchoolNet Program is "spearheading a major survey on the integration of Information and Communication Technologies (ICT) in education..."⁵¹

This survey has been mailed to all First Nations school principals (April, 2004). However, the survey does not contain any questions pertaining to the language(s) of instruction in schools surveyed⁵².

As such, this survey provides no information on the specific educational needs and priorities of First Nations with respect to use of their language(s) (present or planned) and use of ICT.

There is a need for such a survey of all First Nations schools specifically and those of the First Nations in general including the following questions:

- ▶ what are the current language(s) of instruction?
- ▶ in which grades (at what age levels) are these language(s) being taught?
- ▶ do you have any difficulties with ICT in using this/these language(s) of instruction?
- ▶ in what language(s) is/are e-learning resources available?
- ▶ in what language(s) is/are you developing e-learning resources?
- ▶ what additional language(s) are you planning to use/add as language(s) of instruction?
- ▶ etc.

In addition, to questions of this nature being directed at schools of First Nations and Aboriginal peoples and/or where their languages are being taught, it would be most useful to have a similar survey of the First Nations and Aboriginal peoples themselves, i.e., directed at their representatives, including questions on what they understand to be their needs/priorities vis-à-vis language and education including the availability of content related resources.

It is data of this nature which is required to provide benchmark data on user linguistic requirements that is required for the formulation of language priorities including their incorporation and support in international standards and e-learning.

⁵¹See the "What's New" page of First Nations' SchoolNet available at <<http://www.schoolnet.ca/aboriginal/e/main_e.asp>>.

⁵²The survey does contain under section 49 pertaining to "perceived challenges in using ICT in your school pertaining to "obtaining software in the language of instruction". (Question 1604) However, there is no following question as to which language(s) of instruction. It is assumed that this question applies to languages other than English and French.

3.3.6 Working Matrix of "Languages" of Canada's First Nations, Aboriginal Peoples, etc., and Applicable ISO 639-2/T Language Codes

The limited resources available for this project do not permit an extensive study of "What are the languages of Canada's First Nations and Aboriginal peoples?" Further, as pointed out elsewhere in this report, this is (1) a matter for Canada's First Nations and Aboriginal peoples to decide; and, (2) requires a systematic analysis of existing laws and regulations of Canada (at the federal, provincial and territorial levels of jurisdictional domains) to identify which languages already are "legally recognized languages (LRL) in Canada.

The matrix presented below is based on consultations our firm undertook several years ago with respect to:

- ▶ developing the legal and operational requirements for the implementation of the Canadian Environmental Assessment Act (1993-94);
- ▶ the development of the requirements for an IT-enabled prototype implementation of the federal government's (TBS) "Information Holdings" Reporting requirements by Environment Canada (1993-95) (a.k.a., as Envirosource);
- ▶ the development of the user requirements for "standardization of the Northern Information Network (NIN) system (including the development of an It-enabled version of the National Standard of Canada "CAN/CGSB 171.3-94 Directory Information Describing Digital Geo-Referenced Data Sets" for Indian and Northern Affairs (1994-95);
- ▶ a project titled "Towards a Norther Information Portal (NIP): Northern Information Network Business Case Study", for Environment and Renewable Resources, Department of Indian and Northern Affairs (2002).

The matrix below integrates this and other work in this area. It is intended to serve as a "strawman" document for future work as indicated below in Chapter 5. It is also based on several official documents available at that time. The perspective of "families" of languages is one taken by much of the literature on Canada's indigenous languages and may not reflect the perspective of the indigenous peoples themselves.

Working Matrix of "Languages" of Canada's First Nations and Aboriginal Peoples and Application of the ISO 639-2/T Standard for Language Codes							
Table ID	Numeric Codes	Description - English	Description - French	ISO 639-1:1988	ISO 639-2:1998/B	ISO 639-2:1998/T	Notes (including variant names in use in the English (E) and French (F))
	10	ALGONKIAN LANGUAGES	LANGUES ALGONQUIENNES		alg	alg	F = algonquines, langues
	11	Blackfoot	Pied-noir		bla	bla	E = Siksika F = blackfoot
	12	Cree	Cri	cr	cre	cre	F = cree
	13	Malecite	Malécite				
	14	Micmac (Mi'kmaq)	Micmac		mic	mic	
	15	Montagnais-Naskapi	Montagnais-Naskapi				
	16	Ojibwa	Ojibwa	oj	oji	oji	
	20	ATHAPASKAN LANGUAGES	LANGUES ATHAPASCANES		ath	ath	(1) E = Athapaskan Languages (2) F = athapascanes, langues
	21	Beaver	Castor				
	22	Carrier	Porteur				
	23	Chilcotin	Chilcotin				
	24	Chipewyan	Chipewyan		chp	chp	
	25	Dogrib	Flanc-de-chien		dgr	dgr	F = dogrib
	26	Hare	Peau-de-lièvre				
	27	Kutchin (Loucheux) ⁵³	Kutchin (Loucheux)				
	28	Sarcee	Sarsi				
	29	Sekani	Sékanais				
	30	Slavey	Esclave		den	den	(1) E = Slave (Athapaskan) (2) F = esclave (athapaskan)
	31	Tahltan	Tahltan				
	32	Tutchone	Tutchone				

⁵³Gwich'in is also known as Kutchin or Loucheux.

Working Matrix of "Languages" of Canada's First Nations and Aboriginal Peoples and Application of the ISO 639-2/T Standard for Language Codes							
Table ID	Numeric Codes	Description - English	Description - French	ISO 639-1:1988	ISO 639-2:1998/B	ISO 639-2:1998/T	Notes (including variant names in use in the English (E) and French (F))
	40	IROQUOIAN LANGUAGES	LANGUES IROQUIENNES		iro	iro	F = iroquoises, langues (famille)
	41	Mohawk	Mohawk		moh	moh	
	42	Oneida	Onéida				
	50	SALISHAN LANGUAGES	LANGUES SALISHENNES		sal	sal	F = salish, langues
	51	Bella Coola	Bella Coola				
	52	Halkomelem	Halkomelem				
	53	Lillooet	Lillooet				
	54	Okanagan	Okanagan				
	55	Sechelt	Sechelt				
	56	Shuswap	Shuswap				
	57	Squamish	Squamish				
	58	Thompson	Thompson				
	65	TSIMSHIAN LANGUAGES	LANGUES TSIMSHIANES		tsi	tsi	
	66	Coast Tsimshian	Tsimshian de la côte				
	67	Gitsan	Gitksan				
	68	Nishga	Nishga				
	70	WAKASHAN LANGUAGES	LANGUES WAKASHANES		wak	wak	F = wakashennes, langues
	71	Haisla	Haisla				
	72	Heiltsuk	Heiltsuk				
	73	Kwakiutl	Kwakiutl				
	74	Nootka	Nootka				
	80	OTHER LANGUAGE FAMILIES	AUTRES LANGUES				
	81	Haida	Haida		hai	hai	
	82	Inuktitut	Inuktitut	iu	iku	iku	
	83	Tlingit	Tlingit		tli	tli	

Working Matrix of "Languages" of Canada's First Nations and Aboriginal Peoples and Application of the ISO 639-2/T Standard for Language Codes							
Table ID	Numeric Codes	Description - English	Description - French	ISO 639-1:1988	ISO 639-2:1998/B	ISO 639-2:1998/T	Notes (including variant names in use in the English (E) and French (F))
	84	Michif	Michif				
	85	Siouan Language - Dakota ⁵⁴	Langues siouennes - Dakota				

⁵⁴Note: ISO 639-2:1998 has (1) Siouan languages = sio for both B and T codes. It also has Dakota = dak for both B and T codes.

3.3.7 Languages of First Nations and Aboriginal Peoples which may Require Language Identifiers in International Standards

Based on the matrix presented above in Chapter 3.2.6, the following languages of Canada's First Nations and Aboriginal peoples may require language identifiers, i.e., internationally registered and recognized language identifiers as ISO 639-2/T:1998 language codes.

Table ID	Numeric Codes	Description - English	Description - French	ISO 639-2 :1998/T
	13	Malecite	Malécite	??
	15	Montagnais-Naskapi	Montagnais-Naskapi	??
	21	Beaver	Castor	??
	22	Carrier	Porteur	??
	23	Chilcotin	Chilcotin	??
	26	Hare	Peau-de-lièvre	??
	27	Kutchin (Loucheux)	Kutchin (Loucheux)	??
	28	Sarcee	Sarsi	??
	29	Sekani	Sékanais	??
	31	Tahltan	Tahltan	??
	32	Tutchone	Tutchone	??
	42	Oneida	Onéida	??
	51	Bella Coola	Bella Coola	??
	52	Halkomelem	Halkomelem	??
	53	Lillooet	Lillooet	??
	54	Okanagan	Okanagan	??
	55	Sechelt	Sechelt	??
	56	Shuswap	Shuswap	??
	57	Squamish	Squamish	??
	58	Thompson	Thompson	??
	66	Coast Tsimshian	Tsimshian de la côte	??
	67	Gitsan	Gitksan	??
	68	Nishga	Nishga	??
	71	Haisla	Haisla	??
	72	Heiltsuk	Heiltsuk	??
	73	Kwakiutl	Kwakiutl	??
	74	Nootka	Nootka	??
	80	OTHER LANGUAGE FAMILIES	AUTRES LANGUES	
	84	Michif	Michif	??

Table ID	Numeric Codes	Description - English	Description - French	ISO 639-2 :1998/T
	85	Siouan Language - Dakota ⁵⁵	Langues siouennes - Dakota	??

It is up to Canada's First Nations and Aboriginal peoples to decide whether they wish to have any one or more of these languages internationally recognized, i.e., through the establishment and registration of an "ISO 639-2/T" language identifier.

Note: re: 85 Siouan Language - Dakota, i.e., families of languages. The decision has yet to be made as to whether the use of language identifiers at the "family" level is required for Canada's First Nations and Aboriginal peoples themselves.

⁵⁵Note: ISO 639-2:1998 has (1) Siouan languages = sio for both B and T codes. It also has Dakota = dak for both B and T codes.

4.0 INITIAL DRAFT STRATEGY - KEY ELEMENTS

4.1 INTRODUCTION

In this chapter we identify some key elements of the "initial draft strategy". The degree to which they may become elements in the "final strategy" is something for Canada's First Nations and Aboriginal peoples to decide. However, any strategy must take into consideration these key elements.

4.2 INCORPORATING MULTILINGUAL CAPABILITY AND EQUIVALENCY AS A BASIC PRINCIPLE AT THE ARCHITECTURAL AND STRUCTURAL LEVEL

It is much more cost effective and efficient to incorporate multilingual capability and equivalency at the architectural and structural levels when designing and implementing IT-based applications. Being able to deliver goods and services world-wide is a challenge. Tailoring one's products to the needs of the user environment(s) of a local market including legal requirements, demands attention to detail, adaptability and flexibility. Being successful in a market requires not only understanding the needs of clients but also being able to communicate with them in their language. Thus, multilingualism is good business, is good for business and those developing products and services should think multilingual from the start⁵⁶.

A key aspect of such an approach is that the costs involved in adding and supporting each "additional language" become marginal. This is especially important where the number of people using a language is relatively small and resources available limited, i.e., as is the case for many of Canada's First Nations and Aboriginal languages.

As such, it is especially important that the "First Nations SchoolNet" initiative ensure that the ICT products, services, applications, etc., which it supports and/or provides funding for, incorporate multilingual capability and equivalency as a basic principle at the architectural and structural levels.

The same approach needs to be (and has already been) taken by Canada in international standards development. Here with respect to development of the international standards of "Metadata for Learning Resources" (MLR), the Canadian Advisory Committee (CAC) for ISO/IEC JTC1/SC36 "e-learning" took the position that multilingual capability and equivalency should be incorporated at the architectural and structural levels in the development of this multipart MLR standard⁵⁷.

This Canadian contribution states and we quote:

"Here Canada notes that at the federal level, it is officially bilingual, i.e., English and French, and that at the provincial/territorial level that these jurisdictional domains have one, two or more official languages. In addition, Canada's First Nations (or aboriginal peoples) have rights and

⁵⁶See further, Knoppers, K.V.Th. Global electronic commerce through localization and multilingualism. Computer Standards & Interface 20 (1998):101-109.

⁵⁷See further the ISO/IEC JTC1/SC36 document 36N0808 submitted by Canada titled *"Towards a Set of Basic Principles for MLR Multipart Standards Development: Incorporate Multilingual Capability and Equivalency at the Architecture and Structural Levels for MLR Metadata"*. 2004-07-28, available via <<jtc1sc36.org>>.

requirements in many other languages. A primary use of any of these languages in learning, education, and training includes the application and use of information technologies, i.e., e-learning.

In addition, Canada has had several years of actual experience with the implementation of various initiatives in the area of "learning resources" and associated metadata requirements, (e.g., CanCore, EduSource, SchoolNet, Canadian Culture Online (CCO), etc.), as well as detailed surveys of user and legal requirements, (e.g., Normetiq).

As such, for any ISO/IEC JTC1/SC36 "MLR" standard to be able to be either adopted as a "National Standard of Canada" or be applicable and implementable across Canada (or within its jurisdictional domains), such "MLR" standards must incorporate and be able to support multilingual capability and equivalency requirements".

4.3 HUMAN INTERFACE EQUIVALENCIES

Increasingly in the use of ICT, the "semantics", i.e., meaning of "something" in a language, is transformed into a code as part of a coded domain. The "code" is interchanged among IT systems (including the Internet) and then used to generate, at the user interface, the representation of the equivalent semantics (including context) embedded in or associated with the code from a user perspective, i.e., that of a human being. The ISO 639 multipart standard serves as an example which are defined and managed as international standards.

For example, ISO 639-2/T is a coded domain (whose ID is ISO 639-2/T" in which the code "deu" serves to generate various name representations at the human interface level such as:

Human Interface Equivalents - Linguistic - Written		
639-2/T Code	Language Name	German Name Equivalent
deu	indigenous name	deutsch
deu	ISO English	German
deu	ISO French	allemand
deu	"Dutch"	duits
deu	"Spanish"	Alemán

The construct of "human interface equivalent (HIE)" is under development as part of international standards development work in the field of ICT especially with respect to being able to support use of any language as may be required within a jurisdictional domain⁵⁸.

⁵⁸This international standards development work is taking place as part of "eBusiness" standards development, i.e., through ISO/IEC JTC1/SC32 "Data Management and Interchange" specifically its Working Group 1 "eBusiness". The title of this ISO standard being developed is ISO/IEC CD 15944-5 *Information technology - Business Agreement Semantic Descriptive Techniques - Part 5: Identification and Mapping of Various Categories of Jurisdictional Domains as Sources of External Constraints*. This standard has passed the Committee Draft (CD) stage. A 2nd CD ballot document is scheduled to be issued by 15 December,

As such, a semantic component has both a unique and unambiguous identifier from an IT interface perspective on the one hand, and on the other that of the multiple possible human interface equivalents, be they of a linguistic, symbolic, multimedia nature (including provision for human interface requirements for the disabled such as Braille, sign language, BLISS, etc.). A simple, easily understood example of the application of human interface equivalents cultural adaptability, interoperability, etc., is found in Annex A of ISO/IEC 5218:2003 (E/F) titled *Information technology - Codes for the representation of human sexes/Technologies de l'information - Codes pour la représentation des sexes humains*⁵⁹.

4.4 LEGAL REQUIREMENTS (AND RIGHTS)

In Chapter 3.3.3 and 3.3.4 above, we identified "official language" requirements and also introduced the construct of a "legally recognized language (LRL)". Linguistic requirements of an "official language" nature are easily identified. However, those of a "LRL" nature are not so easily identified. But they do exist. The preliminary analysis undertaken for this project has identified many LRL type requirements, and the fact that, these exist in all levels of jurisdictional domains across Canada and at all levels, i.e., federal, provincial/territorial, as well as the emerging new forms of "self-government".

It is most likely that a thorough analysis of all acts, regulations, and related statutory instruments will identify many LRL requirements. It is also likely that when fully identified together these LRLs will have a "critical mass" or requirements both of a general and specific nature.

As such, a key element of the initial draft strategy is that it needs to recognize and support, in addition to the official languages, the legally recognized languages (LRL) of Canada's First Nations and Aboriginal peoples.

Adoption of this element of the strategy also reflects the increasing formal identification of LRL in "land settlements", "self-government" and other agreements being agreed to and enacted between a First Nation and/or an Aboriginal people.

4.5 USER REQUIREMENTS

It is important that the strategy be user requirements-driven and especially where decisions to be taken and priorities for action are concerned.

A significant part of user requirements are reflected in the form of "LRLs". While there are some sources on linguistic requirements (as identified in Chapter 3.2.6) of Canada's First Nations and Aboriginal

2004. In the meantime, one can reference the JTC1/SC32 document "32N1080" available via <<www.jtc1sc32.org>>. Clause 6.2 "Jurisdictional Domains and Official Languages" is of particular relevance here.

⁵⁹ISO/IEC JTC1 has deemed ISO/IEC 5218 to be a very useful example of a practical way to support multilingualism, cultural adaptability, etc., through the construct of human interface equivalents (HIEs). ISO/IEC has therefore decided to make this a "freely available document" via <<www.jtc1.org>>. [Note: Should the freely available IS not yet be posted, readers can access the next-to-final FDIS version as JTC1/SC32 document 32N1067, via <<www.jtc1sc32.org>>].

peoples, there is a need for a survey of the schools of the First Nations and Aboriginal peoples on needs and priorities of their language(s) (present or planned), as was noted in Chapter 3.3.5).

However, while such a survey is do-able, it will require significant resources to undertake. Further, such a survey requires that one have a definitive list of the languages and their names of Canada's First Nations and Aboriginal peoples.

Given the fact that:

- (1) resources in support of the identification of languages of learning resources in particular and languages of use (and language policy for their continued use) will remain scarce; and,
- (2) it is unlikely that resources will become available to undertake a thorough survey of linguistic requirements of Canada's First Nations and Aboriginal peoples in general, and that in the area of learning, education and training in particular (and ensuring their subsequent support in ICT infrastructure)

it would be a more effective strategy to maximize the re-use, i.e., data mining, of readily available known user requirements as can be obtained from existing surveys and similar documents.

Examples of existing surveys/reports include those of: (1) the *2001 Aboriginal Peoples Survey (APS)* of Statistics Canada; (2) the Government of Yukon's *We are our Language*; (3) the *2001 Nunavut Household Survey*; (4) British Columbia's *Handbook for Aboriginal Language Program Planning in British Columbia*, (5) Ontario's *Aboriginal Language Assessment*; and, (6) Manitoba's *Aboriginal Language Instruction in Manitoba*. These examples are an illustrative selective sample and are thus not comprehensive. The details are as follows:

- (1) Statistics Canada (SC) *Aboriginal Languages - 2001 Aboriginal Peoples Survey* Catalogue 89-589-XIE⁶⁰ (Sept. 2003) [ISBN 0-662-34985-7].
- (2) For the Yukon, see for example, *We are our Language: Sharing the Gift of Language. Profile of Yukon First Nation Languages*⁶¹ (2004-05), and its Evaluation Report titled "*We are Our Language: Hope for the Future. A Call for Strategic Action. Five Year Report 1998-2003*" (2004-05), which are prepared by the Aboriginal Languages Services, Government of Yukon, and sponsored by the Canada-Yukon cooperation Agreement for Aboriginal Languages 1998-2003.
- (3) For Nunavut, see (1) the 2000-2001 Annual Report of the Languages Commissioner of Nunavut (pp. 15-51) for "*A Survey of Language Use and Language Services within the Government of*

⁶⁰The APS is not available online though there are several sites which provide summary information. See for example, <http://www.statcan.ca/english/freepub/89-589-XIE/language.htm>. This publication is also available in French under Catalogue No. 89-589-XIF.

⁶¹Retrieved from: <<http://www.gov.yk.ca/depts/eco/ablansvcs/profile_of_yukon_first_nation_languages.pdf. The results of this survey have already been incorporated in Chapter 3.3.3 of this Report.

*Nunavut*⁶²; and, (2) the results of the 2001 Census of Nunavut, in particular the *2001 Nunavut Household Survey* (questions 36-55) (<http://www.stats.gov.nu.ca>) available from the Evaluation and Statistics Division, Department of Executive and Intergovernmental Affairs.

- (4) In addition, there is the *Handbook for Aboriginal Language Program Planning in British Columbia*⁶³.
- (5) *Ontario Aboriginal Language Assessment*⁶⁴
- (6) *Aboriginal Language Instruction in Manitoba. A Survey of Principals and Superintendents of Elementary-Secondary Schools*⁶⁵ (May 2001), prepared by Research and Planning Branch, Manitoba Education, Training and Youth.

Our work on this project, the above noted surveys already identified lead us to conclude that:

- (1) there is little added value to undertaking user requirements surveys. The information is already available in the sources referenced in this Report as well as the languages of Canada's First Nations and Aboriginal peoples which are identified as currently lacking an internationally recognized language identifier, i.e., ISO 639-2/T language code.

The urgent need here is to prepare the necessary documentation and undertake the process for the application and registration of internationally recognized language identifiers, i.e., as ISO 639-2/T language codes.

- (2) that there is a need for the development of a common "language planning strategy and framework" for use and application (and customization) by Canada's First Nations and Aboriginal peoples for "their languages". Here the process of obtaining the needed language identifiers serves as a useful and practical step in the development of such a framework.

⁶²<<http://action.attavik.ca/home/langcom/en_ourwork.shtml>>

⁶³<<<http://www.schoolnet.ca/aboriginal/fnesc/index-e.html>>>

⁶⁴See <http://www.schoolnet.ca/aboriginal/langsite/index1-e.html>

⁶⁵See <http://www.edu.gov.mb.ca/abedu/abland.pdf>

5.0 DECISIONS REQUIRED AND NEXT STEPS

5.1 INTRODUCTION

This "Initial Draft Strategy" has six specific decisions and recommends several next steps to be taken. There is also a decision of a general nature which is more long term oriented. It will benefit from the practical experience and expertise gained from "actually doing something", i.e., prepare several applications for, go through the ISO process, etc., of registering and obtaining a unique language identifier for an initial four (4) through ten (10) languages of Canada's First Nations and Aboriginal peoples, i.e., as part of ISO 639-2/T.

The immediate rationale and justification for this project is that of Canada's First Nations SchoolNet initiative which provides access to Internet connectivity and learning opportunities for First Nations schools under federal jurisdiction. For this initiative to be meaningful and implementable there is a need to develop a strategy and framework model for metadata for learning resources which include and support the ability of Canada's First Nations people to develop metadata for learning resources in their own language (as well as for the content of the learning resources themselves). Work has started on the development of a new international multipart standard ISO/IEC 19788 "*Metadata for Learning Resources*".

It is important that Canada's linguistic requirements including those of its First Nations are incorporated, i.e., supported in the Framework Model of this metadata standard. As such, there is a close link between the development of a strategy for supporting the linguistic requirements of Canada's First Nations and that for international standards development in the field of e-learning.

There is a need for detailed analysis and identification of user requirements, consultation with Canada's First Nations (and Aboriginal peoples), etc. However, **it is vital that one start taking some immediate, pragmatic and do-able steps.** Consequently, this concluding Chapter is titled "*Decisions Required and Next Steps*".

5.2 FUNDAMENTAL DECISION REQUIRED

Without an internationally registered language identifier, i.e., as an ISO 639 code, for each of the languages of Canada's First Nations, it is well nigh impossible to identify, reference and support the linguistic requirements of these languages:

- (a) in any international metadata standard(s) for e-learning resources;
- (b) in and among the languages used in Canada's "First Nations SchoolNet" initiative;
- (c) in any ICT-based application involving Canada's First Nations.

In addition, one needs to know the language of an e-learning resource in order to be able to interchange and share the contents of the same.

The fundamental decision required of this draft strategy is whether or not the federal government of Canada wishes to ensure that Canada's e-Learning Market Strategy (ELMS) includes active

support of the linguistic requirements of Canada's First Nations. The key element here is that of ensuring that at the minimum an internationally recognized unique language identifier exists for each of the languages of Canada's First Nations and Aboriginal peoples, i.e., as ISO 639-2/T codes for their languages.

Having an ISO 639-2/T code is vital to the ability to identify, reference, use that language (and its attributes) in any ICT-based application as well as the interchange and sharing of digitized sets of recorded information (in ICT referred to as "objects").

5.3 NEEDS OF CANADA'S FIRST NATIONS AND ABORIGINAL PEOPLES ARE SIMILAR

It is recognized that the federal government of Canada has particular jurisdictional responsibilities with respect to Canada's First Nations. These include Canada's First Nations schools under federal jurisdiction. However, **the linguistic requirements of Canada's First Nations with respect to international standards and e-learning are very similar, if not the same, as those of Canada's Aboriginal peoples.**

We also note in this context, that the federal government of Canada is heavily involved in negotiating land claim agreements, self-government agreements, etc., with Canada's Aboriginal peoples. These involve linguistic rights in the form of legally recognized languages (LRLs).

Consequently, we recommend that the draft strategy and action items recommended in this Report serve as a basis for an overall Canadian strategy in ensuring that:

- (1) on a short-term basis, the linguistic requirements of Canada's First Nations and Aboriginal peoples are supported in any and all international standards including those particular to e-learning (and metadata for e-learning resources); and,
- (2) on a long-term basis, one develop a coordinated strategy in support of the same in all the ICT-based applications (public and private sector).

5.4 NEED FOR A PRAGMATIC AND ACTION-ORIENTED APPROACH

In Chapter 3, we already identified a number of languages of Canada's First Nations and Aboriginal peoples which (currently) do not have an internationally recognized language identifier, i.e., as an ISO 639-2/T based "code". At the same time, we identified many issues and aspects pertaining to "languages".

This Report identified the need for a more systematic and detailed process for the identification of the linguistic requirements of Canada's First Nations and Aboriginal peoples vis-à-vis ICT-based applications. The sources of these requirements have been identified in this Report. {See Chapter 3}

Initial analyses and review of these sources already identified over thirty (30) languages of Canada's First Nations and Aboriginal peoples which have no internationally recognized language identifiers. There may well be more. [Note: Time and resource constraints did not permit for an "equal" review of all of Canada's provinces and territories. For example, British Columbia requires an analysis on its own].

Further, a review of ISO 639 language registration activity during the past five years has indicated that what was once registered and referenced as a "single language" now has many separate languages and language identifiers⁶⁶. Further, now only have many languages been added, but the names of the languages have also changed. These and related matters are for Canada's First Nations and Aboriginal peoples to decide. For example, there are three different language codes which may be required for "Inuktitut" {See above in Chapter 2.3.6}. The example of Norway (and Norwegian) adding two codes in 2000 for the two writing systems, ("nno" - Norwegian Nynorsk and "nob" - Norwegian Bokmål, respectively), is also a precedent.

However, one needs to take a pragmatic and action-oriented approach. Here the first and essential step is to start the process of preparing the application and supporting documentation required for the registration of a language under the international standard, ISO 639 and obtaining a unique language identifier for it, i.e., as an ISO 639-2/T code.

At a minimum there are already ten (10) languages of Canada's First Nations and Aboriginal peoples which should be considered for inclusion to ISO 639-2/T based on either official languages of Canadian territories/provinces or which are legally recognized languages (LRLs) in the same. In alphabetical order they are as follows:

- (1) Hän (Yukon)
- (2) Inuinnaqtun (Nunavut)
- (3) Inuvialuktun (NWT)
- (4) Kaska (Yukon)
- (5) Michif (Saskatchewan)
- (6) Montagnais-Naskapi (Quebec)
- (7) Northern Tutchone (Yukon)
- (8) Southern Tutchone (Yukon)
- (9) Tagish (Yukon)
- (10) Upper Tanana (Yukon)

It is strongly recommended that as a first step, action be taken and the process started to request and application and registration of these languages and subsequent assignment of an ISO language code, for a minimum of 4-5 of these languages.

⁶⁶The traditional "top-down" and "elitist" approach to "What is a language?" is being replaced by a more pragmatic "bottom-up" approach which empowers a community of people to make decisions of this nature. Former "dialects" are now ISO 639 recognized languages. What was in the past considered to be a single language is now recognized as being several distinct languages as so registered with ISO 639 and its own unique language identifier. For example, the Sami people who live in northern Norway and Finland, used to have a single ISO language code, i.e., "smi" (= Sami). Now there are six (6) Sami languages (and their respective codes) including the original "smi", namely (presented in alphabetical order by "identifier"):

- | | | |
|-------|---|----------------------|
| ▶ sma | = | Southern Sami |
| ▶ sme | = | Northern Sami |
| ▶ smi | = | Sami languages Other |
| ▶ smj | = | Lule Sami |
| ▶ smn | = | Inari Sami |
| ▶ sms | = | Skolt Sami |

Obtaining language codes for these should be a key priority.

5.5 NEED TO ENSURE INVOLVEMENT AND DECISION-MAKING BY CANADA'S FIRST NATIONS AND ABORIGINAL PEOPLES

It is imperative that any preparation of any application for the international registration of a language of Canada's First Nations and Aboriginal peoples fully involve the people whose language it is⁶⁷.

This needs to be done in a focused and "non-technical" manner. Here the most practical straight forward approach is that of working with each First Nation and Aboriginal people in the preparation of an ISO 639-based application for registration of their language(s) and assignment of a unique language identifier(s). This includes the identification and assembling the required supporting documentation.

This will also ensure that these linguistic requirements can be brought forward in a concrete manner into international standards development work particularly in e-learning standards development for metadata for learning resources.

It is likely that from this consultative process that other aspects of linguistic requirements and use of language will be brought to the fore and resolved.

Canada's First Nations and Aboriginal peoples have not gone through (or undertaken) a systematic effort and decision-making process (controlled by them) to identify, ascertain, what:

- ▶ their written language(s) is⁶⁸;
- ▶ the name of that language in their own language;
- ▶ equivalent written form of the name of that language using the Latin-1 character set where their language uses another character set.

The preparation of ISO 639-based application for registration of a language and assignment of a language identifier follows the rules of an international standard. This is a neutral and well-used process. Further, one can benefit from the experience of other examples of the registration of well over 200 languages during the past few years.

Finally, standards are "consensus agreements" and their development is based upon consensus-based and transparent processes. This fits very well with the consensus approach to decision-making of Canada's First Nations and Aboriginal peoples.

⁶⁷This includes a people deciding whether or not they require more than one ISO 63902/T language identifier.

⁶⁸The languages of Canada's First Nations and Aboriginal peoples evolved and were used in their "oral" spoken form. The writing systems currently in use were introduced by others.

5.6 HUMAN INTERCHANGE EQUIVALENTS AND INDIVIDUAL ACCESSIBILITY

The linguistic requirements of Canada's First Nations and Aboriginal peoples include more than those which are the focus of this Report. Chapter 1.5.5 "Individual Accessibility" already notes this. Linguistic requirements of peoples include all forms of communication including Braille, sign language (including Eskimo Sign Language), BLISS symbolics, etc.

It is assumed that support of linguistic requirements of First Nations and Aboriginal peoples include those of individual accessibility and support the same in any ICT infrastructure. It is recommended that this challenge be addressed in a joint project with international e-learning standards development on individual accessibility for which Canada is taking a leadership role.

5.7 FURTHER DEVELOPMENT OF THE "STRATEGY"

As the title states and Chapter 1.4 explains, this is an "Initial Draft Strategy...". The essential elements have been identified while practical and implementable steps while being very useful in their own right also serve as a way to involve the First Nations and Aboriginal peoples in the process. It is through their involvement that the "Strategy" can be fleshed out and completed.

A common thread of Canada's First Nations and Aboriginal peoples, i.e., their "re-emergence" is based on recognition of their rights not having been extinguished, is that of a recognized right to use their own language(s). If not as an official language then as a "legally recognized language (LRL)". At present, even if one of Canada's First Nations and Aboriginal peoples does obtain recognition of its language and the right to use it generally or in some specified context, there is little guidance or assistance on how one goes about implementing the same in a cost-effective manner, provides learning (and other) resources and instruction in that language. As a result, ad-hoc solutions are developed. Further, many view the fact that technical barriers to the use of any language have all but disappeared, due to the development and implementation of the ISO/IEC 10646 "Unicode" standard that the problem is solved. {See above Chapter 2.3.1}.

The opposite is true, i.e., there is no barrier to the use of any language but how does one ensure that a specific language is introduced and recognized for use in ICT and on the Internet especially from a user, i.e., human use interface, perspective?

A closely linked issue now that technical barriers have all but disappeared, is "How does one identify linguistic requirements from a pan-Canadian perspective?"

This work and resulting Report has started the process of the development of a framework and systematic approach to the identification of linguistic requirements of Canada's First Nations and Aboriginal peoples. It should be continued and completed in consultation with Canada's First Nations and Aboriginal peoples.

Applying for an internationally recognized language identifier is a relatively simple series of tasks. However, the consultative process required with and involvement of Canada's First Nations and Aboriginal peoples (who will make the decisions) will bring forward many related issues. It is important that the experience gained and decisions taken by those First Nations and Aboriginal peoples be shared and serve as input into the completion of the strategy, i.e., of those who participate in the first number of ISO 639

applications for language identifiers.

Canada's need for a strategy (and actions) to support the linguistic requirements of its First Nations and Aboriginal peoples in international standards and e-learning is not unique. They are shared by many countries in the world. As such, the strategy developed and actions taken will serve as a potential prototype for use by other countries facing similar challenges, (e.g., many members of «la Francophonie»).

ANNEX A - SCC SPECIAL ACHIEVEMENT AWARD TO CAC JTC1/SC36

From its establishment, summer 2002, the Canadian Advisory Committee (CAC) for ISO/IEC JTC1/SC36 has been a very active committee. Its leadership role has been recognized by the Standards Council of Canada through its receiving the 2004 "SCC Special Achievement Award". This award is presented by the SCC only once every two years to one of the 400+ Canadian standards committees in all fields of standardization. The citation of this SCC award reads as follows:

SCC Special Achievement Award

This award recognizes notable contributions made by a Committee that have benefited Canada's international or national standardization and or conformity assessment activities. Notable contributions include the development or the completion of a national or international standard or action.

Prix décerné pour réalisations exceptionnelles

Prix attribué à un Comité ayant apporté une contribution remarquable aux travaux de normalisation ou d'évaluation de la conformité, nationaux et internationaux, du Canada, dans le cadre de l'élaboration d'une norme nationale ou internationale, ou d'une activité connexe, ou de la réalisation des travaux entrepris au cours de sa phase finale.

CAC/JTC1/SC36 E-Learning

The Canadian Advisory Committee on Information Technology for learning, education and training (CAC/JTC1/SC36) is a relatively young committee, which has achieved remarkable success in its short existence.

First established as an Observer Member to ISO/IEC JTC1/SC36, the committee's nucleus of dedicated members rapidly achieved Participating Member status by recruiting new members who quickly became actively involved in the work of the JTC1 subcommittee.

CAC/JTC1/SC36 has made over 50 contributions to the active projects of the international joint committee and is now sponsoring several new international standardization projects.

In March 2004, the CAC hosted the 9th International Plenary of ISO/IEC JTC1/SC36 in Montreal. In conjunction with the plenary, it also organized and hosted a two-day international Open Forum on e-Learning Standards Development. The informative event featured an opening address by Quebec Education Minister Pierre Reid and drew participants from the World Bank, UNESCO, and la Francophonie.

Le CCC/JTC1/SC36

Le Sous-comité sur les Technologies pour l'éducation, la formation et l'apprentissage, CCC/JTC1/SC36, du Comité consultatif canadien est un Sous-comité relativement récent qui malgré sa jeune existence a déjà obtenu un succès remarquable.

Noyau de membres dévoués formé à l'origine pur siéger en tant que membre observateur de l'ISO/CEI/JTC1/SC36, Sous-comité de l'ISO/CEI chargé de la normalisation des technologies pour la formation, ce Sous-Comité a vite acquis le statut de membre participant en recrutant de nouveaux membres, qui n'ont pas tardé à participer activement à ses travaux.

Le CCC/JTC1/SC36 a participé à la réalisation de plus de 50 projets du JTC1, le Comité mixte international, et parraine actuellement plusieurs nouveaux projets de normalisation internationale.

Le CCC a accueilli en mars 2004, à Montréal, au Québec, la 9^e Plénière internationale de l'ISO/CEI JTC1/SC36. Dans le cadre de cette plénière, il a organisé et accueilli un Colloque international de deux jours sur les normes de la formation en ligne, dont l'allocution d'ouverture prononcée par Monsieur Pierre Reid, Ministre de l'Éducation du Québec, a attiré des gens de la Banque mondiale, de l'UNESCO et de toute la francophonie.

ANNEX B - MATRIX OF OFFICIAL LANGUAGES OF SOUTH AFRICA AND NAMES OF SOUTH AFRICA'S PROVINCES WITH THEIR NAMES IN THE OFFICIAL LANGUAGES

As part of its transformation of a country based on "apartheid" principles, South Africa adopted an eleven official language policy as part of its new constitution⁶⁹. It recognizes as official languages, key languages of South Africa's aboriginal (or indigenous) peoples.

We have used the South African example to prepare in matrix form a presentation of each of these official languages of South Africa with their variant names in each official language and then for each of its provinces as jurisdictional domains.

This matrix has been prepared as an illustrative⁷⁰ example. A matrix similar in nature eventually will need to be developed for the names of the "official" languages as well as "legally recognized languages (LRL)" of Canada's First Nations and Aboriginal peoples.

We have done so as follows:

- (1) for "jurisdictional domain" we identify:
 - (a) each province of South Africa by its ISO 3166-1 country code = 710;
 - (b) each province of South Africa by its ISO 3166-2 administrative subdivision code;
- (2) for each official language for South Africa's official language, we provide (as available) its 2-alpha ISO 639-1 and its 3-alpha ISO 639-2/T language identifiers; and,
- (3) then for each intersect of (1) and (2) we provide the name representation of each of the provinces in each of the official languages of South Africa.

We recommend as an action item that the "Working Matrix of "Languages" of Canada's First Nations, Aboriginal Peoples" (as provided in Chapter 3.3.6) be further developed to include representation/presentation of the nature of this matrix.

⁶⁹<<www.policy.org.za/govdocs/constitution/saconst.html>>

⁷⁰Time and resource constraints did not allow for 100% verification with South African authorities on the contents of the "celles" in this matrix.

Matrix of Official Languages of South Africa												
Jurisdictional Domain ID		Human Interface (Linguistic) Equivalents: South Africa's Eleven Official Languages (using the indigenous names)										
ISO 3166-1 Country Codes	ISO 3166-2 Codes	English	Afrikaans	Setswana	Siswati	Xitsonga	Tshivenda	Ixixhosa	IsiZulu	Sepedi	Sesotho	Isindebele
		(en)* (eng)**	(af) (afr)	(tn) (tsn)	(ss) (ssw)	(ts) (tso)	(ve) (ven)	(xh) (xho)	(zu) (zul)	(??) (nso)	(st) (sot)	(nr) (nbl)
710	EC	Eastern Cape	Oos-Kaap	Kapa Botlhaba	Iphrovinsi Yase Mpumalanga Kapa	Xifundzankulu xa Kapa-vuxa	Phurovintsi ya Kapa Vhubvadvha	Impuma-Koloni	Mpumalanga Koloni	Kapa Bohlabela	Kapa Botjhabela	Pumalanga-Kapa
710	FS	Free State	Vrystaat	Foreistata	Iphrovinsi Yase Freyistata	Xifundzankulu xa Fristata	Phurovintsi ya Fureisitata	Ifreyistathi	Frestata	Foreistata	Freistata	Freyistata
710	GT	Gauteng	Gauteng	Gauteng	Iphrovinsi Yase Hawutengi	Xifundzankulu xa Gauteng	Phurovintsi ya Gauteng	I-Rhawutini	IGauteng	Gauteng	Kgauteng	Gauteng
710	NL	KwaZulu Natal	Kwazulu-Natal	Kwazulu-Natal	Iphrovinsi Yaka-Zulu Natali	Xifundzankulu xa Kwazulu-Natala	Phurovintsi ya Kwazulu-Natala	I-Kwazulu Natala	KwaZulu-Natali	Kwazulu-Natal	Ha Zolo-Natala	Kwazulu-Natal
710	MP	Mpumalanga	Mpumalanga	Mpumalanga	Iphrovinsi Yase Mpumalanga	Xifundzankulu xa Mpumalanga	Phurovintsi ya Mpumalanga	I-Mpumalanga	isifundazwe saseMpumalanga	Mpumalanga	Mpumalanga	Mpumalanga
710	NC	Northern Cape	Noord-Kaap	Kapa Bokone	Iphrovinsi Yase Nyakatho Kapa	Xifundzankulu xa Kapa-N'walungu	Phurovintsi ya Kapa Devhula	Umntla-Kapa	iNyakatho Koloni	Kapa Lebowa	Kapa Leboya	Thagwini-Kapa
710	LP	Limpopo ⁷¹ (formerly Northern Province)	? Noordelike Provinsie	? Porofense ya Leboa	? Iphrovinsi Yase Nyakatho	? Xifundzankulu xa N'walungu	? Phurovintsi ya Devhula	? Iphondo IoMntla	? isifundazwe sase Nyakatho	? Profense ya Lebowa	? Provense ya Leboya	? Iprovinsi Yetthagwini

⁷¹Note: In 2002-02-14 Northern Province requested that its name be changed to Limpopo. This name change was accepted by the South African Minister of Arts, Culture, Science and Technology 2003-06-11 {See <http://www.statoids.com/uza.html>>>}. Further work is required to insert the human interface (linguistic) equivalents for "Limpopo" in all of South Africa's official languages.

Matrix of Official Languages of South Africa												
Jurisdictional Domain ID		Human Interface (Linguistic) Equivalents: South Africa's Eleven Official Languages (using the indigenous names)										
ISO 3166-1 Country Codes	ISO 3166-2 Codes	English	Afrikaans	Setswana	Siswati	Xitsonga	Tshivenda	Ixixhosa	IsiZulu	Sepedi	Sesotho	Isindebele
		(en)* (eng)**	(af) (afr)	(tn) (tsn)	(ss) (ssw)	(ts) (tso)	(ve) (ven)	(xh) (xho)	(zu) (zul)	(??) (nso)	(st) (sot)	(nr) (nbl)
710	NW	North-West	Noord-Wes Provinsie	Bokone Bophirima	Iphrovinsi Yase Nyakatho Nshonalanga	Xifundzankulu xa N'walungu-Vupeladyambu	Phurovintsi ya Devhula Vhukovhela	Umntla Ntshone	isifundazwe saseNyakatho Ntshonalanga	Lebowa Bodikela	Leboya Bophirimela	Tlhagwini-Tjingalanga
710	WC	Western Cape	Wes-Kaap	Kapa Bophirima	Iphrovinsi Yase Nshonalanga Kapa	Xifundzankulu xa Kapa-Vupeladyambu	Phurovintsi ya Kapa Vhukovhela	Intshone Koloni	iNtshonalanga Koloni	Kapa Bodikela	Kapa Bophirimela	Tjingalanga-Kapa

* These are the 2-alpha language codes taken from ISO 639-1:2001

** These are the 3-alpha language codes taken from ISO 639-2/T:1998

ANNEX C - LIST OF DEFINITIONS AND TERMS USED IN THIS REPORT

C.1 INTRODUCTION

1. This Report contains a number of key concepts as specified through their definitions and associated terms, i.e., labels. Having common concepts, as described through their definitions and associated terms, is vital to ensuring a common understanding among all parties involved as well as those for whom the objective of this work is important.

It is most likely that those reading this Report will have differing backgrounds, various perspectives and priorities, variations in their facility and ability in their use of one or more languages (whatever these languages are), minimum experience/expertise in standards development, etc. Having a common set of definitions and associated terms is useful to all parties reading this Report.

2. The objectives of this project are very important, if not crucial, to:
 - ▶ the ability to support linguistic requirements of Canada's First Nations and Aboriginal peoples in international standards and e-learning including those relevant to their use in any application involving information and communication technologies (ICT) and supporting ICT infrastructure(s);
 - ▶ ensuring that such linguistic (user) requirements can and will be supported in the e-learning market (public and private sector components);
 - ▶ the maximization of a cost-effective and efficient approach in use in ICT particularly from a user implementation perspective;
 - ▶ facilitate and maximize IT-enabled approach by ensuring that internationally recognized language identifiers exist, i.e., as part of ISO 639-2/T, for all the languages of Canada's First Nations and Aboriginal peoples;
 - ▶ ensure that e-learning strategies (whatever their source) are based on and promote a common set of principles, i.e., including those already identified in this Report;
 - ▶ others.
3. The importance of the role of definitions and terms in ensuring a common understanding among all parties is recognized and underscored by international standards organizations in making the same one of the three mandatory components of any international standard, is that of "Definitions".

For example, the ISO/IEC Directives Part 2 (which must be adhered to in the drafting, balloting, subsequent international acceptance and formal recognition of an international standard), require that any such ISO standard must have a "normative" mandatory "Clause 3 Definitions". Key reasons here include that:

- (1) a significant value-added aspect of any standard is that it addresses, resolves and then results in a consensus agreement, i.e., as an ISO standard with respect to something "new", i.e., a new issue, problem, common need, etc., which is significant enough from a world-wide perspective to involve the participation of multiple countries in order to develop a "global" solution; and/or;
- (2) even if one assumes that such a common understanding exists for the use of a common word in a language, i.e., as a term in an ISO standard, then having such a common definition (and associated term) in Clause 3 serves to formally and explicitly affirm (re-affirm) such a common understanding, world-wide, i.e., as documented in an ISO standard.

C.2 ORGANIZATION OF MATRIX OF TERMS AND DEFINITIONS

The organization and presentation of this Annex C reflects and is compliant with:

- ▶ that used in international standards, (e.g., those of "Clause 3 Definitions") in any ISO standard (as well as those in use for the multipart ISO/IEC 15944 eBusiness standard);
- ▶ those which are required to support the English/French official language requirements of the federal government of Canada; and,
- ▶ that of supporting a multilingual expandable approach, i.e., the ability to add and include multiple "Human Interface Equivalents (HIEs)" in any language in the most cost-effective and efficient way possible.

The list of definitions and terms found in this Report are presented below in matrix form, in Chapter C.3 in this Report. The organization of this matrix is as follows:

Col. No.	Use
01	The ID number for the definition/term pair (irrespective of the language in which it is presented). [Note: For the purposes of this Report this ID number is a simple "count" sequential number. To date there are a total of 14 such ID numbers].

Col. No.	Use
02	The equivalent English language term utilized. [Note: For the purposes of this Report, this matrix is sorted in English language alphabetical order].
03	The equivalent English language definition utilized.
04*	The equivalent French language term utilized.
05*	The equivalent French language definition utilized.
06	The source authority (SA) for this entity in this list. [Note: Here the SA can be: (1) an existing ISO standard; and (2) a definition/term as stated in an official website of a Canadian government ministry, (e.g., INAC/AINC) and so cited in this Report. When the status of the definition is still in draft form, this too has been noted]

* Where the source authority references already provided paired English/French definition/term entry, the existing available text has been provided. It is assumed that Canada will provide the French language equivalent definitions and terms related to the development of the multipart ISO/IEC 19788 standard. Those definitions in this Annex C which pertain to the multipart ISO/IEC 15944 standard are in progress of being translated into their French language equivalents by Canada, i.e., by those qualified as having expertise in terminology, ISO standards and ICT technology.

C.3 MATRIX OF TERMS AND DEFINITIONS FOUND IN THIS REPORT

No. (01)	Term - English (02)	Definition - English (03)	Term - French (04)	Definition - French (05)	Source (06)
1	Aboriginal peoples	the descendants of the original inhabitants of North America. The Canadian constitution recognizes three groups of Aboriginal people - Indians, Métis and Inuit. These are three separate peoples with unique heritages, languages, cultural practices and spiritual beliefs.	Peuples autochtones	les descendants des premiers habitants de l'Amérique du Nord. La constitution canadienne reconnaît trois peuples autochtones: les Indiens, les Métis et les Inuit. Il s'agit de trois peuples, chacun se distinguant des autres par son patrimoine, sa langue, ses habitudes culturelles et ses croyances.	INAC/AINC
2	communication	transfer of meaning by means of transmission of signals. (1.1.3.01)			ISO 5217:2000
3	de facto language	a natural language used in a jurisdictional domain which has the properties and behaviours of an official language in that jurisdictional domain without having formally been declared as such by that jurisdictional domain. NOTE 1 A de facto language of a jurisdictional domain is often established through long term use and custom. NOTE 2 Unless explicitly stated otherwise and for the purposes of modelling a business transaction through scenario(s), scenario attributes and/or scenario components, a de facto language of a jurisdictional domain is assumed to have the same properties and behaviours of an official language.			ISO/IEC CD 15944-5:200n:

No. (01)	Term - English (02)	Definition - English (03)	Term - French (04)	Definition - French (05)	Source (06)
4	e-learning	the utilization of information and communication technologies (ICT) in support of user requirements in the areas of learning, education and training.	apprentissage en ligne	utilisation des technologies de l'information et de la communication (TIC) en support aux besoins d'un utilisateur dans les domaines de l'apprentissage, de l'éducation et de la formation.	ISO/IEC JTC1/SC36 N0761 <i>"Proposed definition for "e-learning"/«apprentissage en ligne»"</i>
5	First Nation	a term that came into common usage in the 1970s to replace the word "Indian", which some people found offensive. Although the term First Nation is widely used, no legal definition of it exists. Among its uses, the term "First Nations peoples" refers to the Indian peoples in Canada, both Status and non-Status. Some Indian peoples have also adopted the term "First Nation" to replace the work "band" in the name of their community.	Première nation	terme dont l'usage s'est répandu dans les années 1970 afin de remplacer le mot Indien, que certains trouvaient choquant. Bien que l'expression Première nation soit largement utilisée, il n'en existe aucune définition officielle. On emploie notamment l'expression gens des Premières nations pour désigner les Indiens habitant au Canada, qu'ils possèdent ou non le statut d'Indien. Certains Indiens ont aussi opté pour le terme Première nation afin de remplacer le mot band dans le nom de leur collectivité.	INAC/AINC

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
6	Indians	Indian peoples are one of three groups of people recognized as Aboriginal in the Constitution Act, 1982. It specifies that Aboriginal people in Canada consist of Indians, Inuit and Métis. Indians in Canada are often referred to as "Status Indians, non-Status Indians and Treaty Indians.	Indiens	les Indiens forment l'un des trois groupes de personnes appelées Autochtones dans la Loi constitutionnelle de 1982. LA Loi stipule que les Autochtones au Canada comprennent les Indiens, les Métis et les Inuit. On désigne souvent les Indiens au Canada comme étant des Indiens inscrits, des Indiens non inscrits et des Indiens visés par un traité.	INAC/AINC
7	Inuit	an Aboriginal people in Northern Canada, who live in Nunavut, Northwest Territories, Northern Quebec and Northern Labrador. The word means "people" in the Inuit language - Inuktitut. The singular of Inuit is Inuk.	Inuit	autochtones du Nord canadien qui vivent au Nunavut, dans les Territoires du Nord-Ouest, dans le Nord du Québec et le Nord du Labrador. Dans la langue inuite, l'inuktitut, le mot signifie «les gens».	INAC/AINC
8	language	system of signs for communication usually consisting of a vocabulary and rules. (1.1.2.01)			ISO 5217 :2000

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
9	legally recognized language (LRL)	<p>a natural language which has status (other than an official language or de facto language) in a jurisdictional domain as stated in an act, regulation, or other legal instrument, which grants a community of people (or its individuals) the right to use that natural language in the context stipulated by the legal instrument(s).</p> <p>NOTE The LRL can be specified through either:</p> <ul style="list-style-type: none"> ▶ the identification of a language by the name utilized; or, ▶ the identification of a people and thus their language(s). <p>EXAMPLE In addition to acts and regulations, legal instruments include self-government agreements, land claim settlements, court decisions, jurisprudence, etc.</p>			This draft definition will be put forward by Canada in international standards development work.
10	meaning	interpretation of a concept associated with a sign. (1.1.3.04)			ISO 5217 :2000
11	Métis	people of mixed First Nation and European ancestry who identify themselves as Métis, as distinct from First Nations people, Inuit or non-Aboriginal people. The Métis have a unique culture that draws on their diverse ancestral origins, such as Scottish, French, Ojibway and Cree.	Métis	personnes d'ascendance mixte - qui possèdent des ancêtres européens et issus d'une Première nation - se désignant eux-mêmes comme Métis et se distinguant ainsi des membres des Premières nations, de Inuit et des non-autochtones. Les Métis possèdent une culture unique, inspirée de leurs origines ancestrales diverses, qui peuvent être écossaises, françaises, ojibways et cries.	INAC/AINC

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
12	natural language	language which is or was in active use in a community of people, and the rules of which are mainly deduced from the usage. (1.1.2.02)			ISO 5217 :2003
13	official language	<p>an external constraint in the form of a natural language specified by a jurisdictional domain for official use by Persons forming part of and/or subject to that jurisdictional domain for use in communication(s) either (1) within that jurisdictional domain; and/or, (2) among such Persons, where such communications are recorded information involving commitment(s).</p> <p>NOTE 1 Unless official language requirements state otherwise, Persons are free to choose their mutually acceptable natural language and/or special language for communications as well as exchange of commitments.</p> <p>NOTE 2 An official language(s) can be mandated for formal communications as well as provision of goods and services to Persons subject to that jurisdictional domain and for use in the legal and other conflict resolution system(s) of that jurisdictional domain, etc.</p>			ISO/IEC CD 15944-5:200n

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
--	official language (cont'd)	<p>NOTE 3 Where applicable, use of an official language may be required in the exercise of rights and obligations of individuals in that jurisdictional domain.</p> <p>NOTE 4 Where an official language of a jurisdictional domain has a controlled vocabulary of the nature of a terminology, it may well have the characteristics of a special language. In such cases, the terminology to be used must be specified.</p>			
--	official language (cont'd)	<p>NOTE 5 For an official language, the writing system(s) to be used shall be specified, where the spoken use of a natural language has more than one writing system.</p> <p>EXAMPLE The spoken language of use of an official language may at times have more than one writing system. For example, two writing systems exist for the Inuktitut language, namely, one Latin-1 based (Roman), the other syllabic-based. Another example is that of Norway which has two official writing systems both Latin-1 based namely "Bokmål (Dano-Norwegian) and Nynorsk (New Norwegian).</p> <p>NOTE 6 A jurisdictional domain may have more than one official language but these may or may not have equal status.</p> <p>EXAMPLE Canada has two official languages, Switzerland has three, while the Union of South Africa has eleven official languages.</p>			

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
--	official language (cont'd)	<p>NOTE 7 The BOV requirement of the use of a specified language will place that requirement on any FSV supporting service.</p> <p>EXAMPLE A BOV requirement of Arabic, Chinese, Russian, Japanese, Korean, etc., as an official language requires the FSV support service to be able to handle the associated character sets.</p>			
14	sign	any physical phenomenon interpreted to convey meaning. (1.1.3.02)			ISO 5217 :2000

C.3 MATRIX OF TERMS AND DEFINITIONS FOUND IN THIS REPORT

No. (01)	Term - English (02)	Definition - English (03)	Term - French (04)	Definition - French (05)	Source (06)
1	Aboriginal peoples	the descendants of the original inhabitants of North America. The Canadian constitution recognizes three groups of Aboriginal people - Indians, Métis and Inuit. These are three separate peoples with unique heritages, languages, cultural practices and spiritual beliefs.	Peuples autochtones	les descendants des premiers habitants de l'Amérique du Nord. La constitution canadienne reconnaît trois peuples autochtones: les Indiens, les Métis et les Inuit. Il s'agit de trois peuples, chacun se distinguant des autres par son patrimoine, sa langue, ses habitudes culturelles et ses croyances.	INAC/AINC
2	communication	transfer of meaning by means of transmission of signals. (1.1.3.01)			ISO 5217 :2000
3	de facto language	a natural language used in a jurisdictional domain which has the properties and behaviours of an official language in that jurisdictional domain without having formally been declared as such by that jurisdictional domain. NOTE 1 A de facto language of a jurisdictional domain is often established through long term use and custom. NOTE 2 Unless explicitly stated otherwise and for the purposes of modelling a business transaction through scenario(s), scenario attributes and/or scenario components, a de facto language of a jurisdictional domain is assumed to have the same properties and behaviours of an official language.			ISO/IEC CD 15944-5:200n:

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
4	e-learning	the utilization of information and communication technologies (ICT) in support of user requirements in the areas of learning, education and training.	apprentissage en ligne	utilisation des technologies de l'information et de la communication (TIC) en support aux besoins d'un utilisateur dans les domaines de l'apprentissage, de l'éducation et de la formation.	ISO/IEC JTC1/SC36 N0761 <i>"Proposed definition for "e-learning"/«apprentissage en ligne»"</i>
5	First Nation	a term that came into common usage in the 1970s to replace the word "Indian", which some people found offensive. Although the term First Nation is widely used, no legal definition of it exists. Among its uses, the term "First Nations peoples" refers to the Indian peoples in Canada, both Status and non-Status. Some Indian peoples have also adopted the term "First Nation" to replace the work "band" in the name of their community.	Première nation	terme dont l'usage s'est répandu dans les années 1970 afin de remplacer le mot Indien, que certains trouvaient choquant. Bien que l'expression Première nation soit largement utilisée, il n'en existe aucune définition officielle. On emploie notamment l'expression gens des Première nations pour désigner les Indiens habitant au Canada, qu'ils possèdent ou non le statut d'Indien. Certains Indiens on aussi opté pour le terme Première nation afin de remplacer le mot band dans le nom de leur collectivité.	INAC/AINC

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
6	Indians	Indian peoples are one of three groups of people recognized as Aboriginal in the Constitution Act, 1982. It specifies that Aboriginal people in Canada consist of Indians, Inuit and Métis. Indians in Canada are often referred to as "Status Indians, non-Status Indians and Treaty Indians.	Indiens	les Indiens forment l'un des trois groupes de personnes appelées Autochtones dans la Loi constitutionnelle de 1982. LA Loi stipule que les Autochtones au Canada comprennent les Indiens, les Métis et les Inuit. On désigne souvent les Indiens au Canada comme étant des Indiens inscrits, des Indiens non inscrits et des Indiens visés par un traité.	INAC/AINC
7	Inuit	an Aboriginal people in Northern Canada, who live in Nunavut, Northwest Territories, Northern Quebec and Northern Labrador. The word means "people" in the Inuit language - Inuktitut. The singular of Inuit is Inuk.	Inuit	autochtones du Nord canadien qui vivent au Nunavut, dans les Territoires du Nord-Ouest, dans le Nord du Québec et le Nord du Labrador. Dans la langue inuite, l'inuktitut, le mot signifie «les gens».	INAC/AINC
8	language	system of signs for communication usually consisting of a vocabulary and rules. (1.1.2.01)			ISO 5217 :2000

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
9	legally recognized language (LRL)	<p>a natural language which has status (other than an official language or de facto language) in a jurisdictional domain as stated in an act, regulation, or other legal instrument, which grants a community of people (or its individuals) the right to use that natural language in the context stipulated by the legal instrument(s).</p> <p>NOTE The LRL can be specified through either:</p> <ul style="list-style-type: none"> ▶ the identification of a language by the name utilized; or, ▶ the identification of a people and thus their language(s). <p>EXAMPLE In addition to acts and regulations, legal instruments include self-government agreements, land claim settlements, court decisions, jurisprudence, etc.</p>			This draft definition will be put forward by Canada in international standards development work.
10	meaning	interpretation of a concept associated with a sign. (1.1.3.04)			ISO 5217 :2000
11	Métis	people of mixed First Nation and European ancestry who identify themselves as Métis, as distinct from First Nations people, Inuit or non-Aboriginal people. The Métis have a unique culture that draws on their diverse ancestral origins, such as Scottish, French, Ojibway and Cree.	Métis	personnes d'ascendance mixte - qui possèdent des ancêtres européens et issus d'une Première nation - se désignant eux-mêmes comme Métis et se distinguant ainsi des membres des Premières nations, de Inuit et des non-autochtones. Les Métis possèdent une culture unique, inspirée de leurs origines ancestrales diverses, qui peuvent être écossaises, françaises, ojibways et cries.	INAC/AINC

No. (01)	Term - English (02)	Definition - English (03)	Term - French (04)	Definition - French (05)	Source (06)
12	natural language	language which is or was in active use in a community of people, and the rules of which are mainly deduced from the usage. (1.1.2.02)			ISO 5217 :2003
13	official language	<p>an external constraint in the form of a natural language specified by a jurisdictional domain for official use by Persons forming part of and/or subject to that jurisdictional domain for use in communication(s) either (1) within that jurisdictional domain; and/or, (2) among such Persons, where such communications are recorded information involving commitment(s).</p> <p>NOTE 1 Unless official language requirements state otherwise, Persons are free to choose their mutually acceptable natural language and/or special language for communications as well as exchange of commitments.</p> <p>NOTE 2 An official language(s) can be mandated for formal communications as well as provision of goods and services to Persons subject to that jurisdictional domain and for use in the legal and other conflict resolution system(s) of that jurisdictional domain, etc.</p>			ISO/IEC CD 15944-5:200n

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
--	official language (cont'd)	<p>NOTE 3 Where applicable, use of an official language may be required in the exercise of rights and obligations of individuals in that jurisdictional domain.</p> <p>NOTE 4 Where an official language of a jurisdictional domain has a controlled vocabulary of the nature of a terminology, it may well have the characteristics of a special language. In such cases, the terminology to be used must be specified.</p>			
--	official language (cont'd)	<p>NOTE 5 For an official language, the writing system(s) to be used shall be specified, where the spoken use of a natural language has more than one writing system.</p> <p>EXAMPLE The spoken language of use of an official language may at times have more than one writing system. For example, two writing systems exist for the Inuktitut language, namely, one Latin-1 based (Roman), the other syllabic-based. Another example is that of Norway which has two official writing systems both Latin-1 based namely "Bokmål (Dano-Norwegian) and Nynorsk (New Norwegian).</p> <p>NOTE 6 A jurisdictional domain may have more than one official language but these may or may not have equal status.</p> <p>EXAMPLE Canada has two official languages, Switzerland has three, while the Union of South Africa has eleven official languages.</p>			

No.	Term - English	Definition - English	Term - French	Definition - French	Source
(01)	(02)	(03)	(04)	(05)	(06)
--	official language (cont'd)	<p>NOTE 7 The BOV requirement of the use of a specified language will place that requirement on any FSV supporting service.</p> <p>EXAMPLE A BOV requirement of Arabic, Chinese, Russian, Japanese, Korean, etc., as an official language requires the FSV support service to be able to handle the associated character sets.</p>			
14	sign	any physical phenomenon interpreted to convey meaning. (1.1.3.02)			ISO 5217 :2000

