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Information Technology

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Secretariat, ISO/IEC JTC 1, American National Standards Institute, 25 West 43rd Street, New York, NY 10036; Telephone: 1 212 642 4932; Facsimile: 1 212 840 2298; Email: lrajchel@ansi.org

ISO/IEC JTC1 SC36 N1920

ISO/IEC JTC1 SC36
Information Technology for Learning, Education, and Training

Title:

Proposal for New Work Item on Information Model for Competency

Source:

National Body of Japan(JISC)

Project:

Information Model for Competency

Document Type:

Text for NP ballot

Status:

This document is circulated to SC36 P-members for ballot in accordance with Umeå SC 36 resolution 9(36N1888). Please use the ISO electronic committee balloting application and vote by 2010-03-08 at the latest.

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2009-12-08

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P, O, & L Members

October 2009

PROPOSAL FOR A NEW WORK ITEM

Date of presentation of proposal: 2009-09-20	Proposer: NB of Japan
Secretariat: KATS	**ISO/IEC JTC 1 N** XXXX ISO/IEC JTC 1/SC 36 N1920

A proposal for a new work item shall be submitted to the secretariat of the ISO/IEC joint technical committee concerned with a copy to the ISO Central Secretariat.

Presentation of the proposal - to be completed by the proposer.

Title Proposal for a New Work Item on Information Technology for Learning, Education and Training-Information Model for Competency

Scope (and field of application)

This International Standard will provide framework, models and additional components such as semantic model for competency information, system architecture of competency information management and exchange, semantic model for competency proficiency level information, a way to aggregate information pieces regarding competency included in educational objectives, and or job performance. Moreover it will indicate use cases that may be used by software developers, implementers, and architects of human resources system and learning system. These use cases will support management and exchange of competency information within information technology systems used for learning, education, and training. Based on work completed in ISO/IEC TR 24763, this multi-part standard will be developed with the following title:

"Information technology for Learning , Education and Training – Information Model for Competency (ICO) and with the following three Parts already identified:

Part 1 - Semantics (ICO-S)

Part 2 - Proficiency Level (ICO-P) ; and,

Part 3 - Aggregation (ICO-A) ; Technical Report, Type 2.

This multipart International Standard will provide

- A framework for dealing with competency information in information technology for learning, education, and training (ITLET) context.
- A system architecture for managing and exchanging competency information and its related objects.
- An information model for expressing semantics of competency and its related objects.
- Relevant linkages and relationships between this information models and ISO/IEC TR 24763.
- An information model for expressing semantics of competency proficiency level.
- A data driven architecture for managing aggregation of competency information and its related objects.
- A way to aggregate competency information and its related objects data; and,
- Use cases of these models.

ISO/IEC TR 24763 provides information entities and relationships regarding competency and its related objects at conceptual model level. In order for the conceptual framework of TR 24763 to be implemented in practice, it should be transformed into a more concrete model such as information model at logical model level. This multipart international standard focuses on the information model, and provides mappings between ISO/IEC TR 24763 and this standard.

In order to develop information models, not to develop psychical model level, a platform-independent approach will be followed. Guidance will be provided regarding an informative framework, which will include an architecture that describes how information is exchanged within and among information technology systems that are used to support the management and exchange of competency information. In addition, this standard will assist with understanding of an informative framework for those designing, developing, and working with IT systems that are used to support the management and exchange of competency information for learning, education, and training.

This standard also will focus on defining and expressing types and proficiency levels of knowledge, skill, ability, and attitude. Although ISO/IEC TR 24763 provides a common language and approach for them, it does not define detailed information for them as competency. This standard will describe how ISO/IEC TR 24763 entities may be arranged and recomposed to support the management and exchange of competency information present in information and communication technology (IT) systems used to support learning, education, and training (LET).

During previous study periods, many NBLOs provided information. Based on the information provided and pertinent submissions provided during this standards development process, use cases of this semantic information model will be described.

Purpose and justification

Currently organizations, such as schools, universities, institutes, and companies, use different IT systems for LET to support the use of learning content, to enable various learning activities, and to provide other services. To meet their mission and goals, these organizations may rely on in-house developers, others such as ITLET vendors or suppliers, or a combination of both to provide and operate IT systems to support LET. This means ITLET operations and other organizational systems that deal with skills and competency information, such as interrelated human resources (HR) information systems, need to be interoperable to allow for communication between organizations, their employees, and outsourcing ITLET providers or suppliers.

From the late 1990s, some industrial and academic organizations have developed information technology standards in the skills and competency domain, such as human resources, on a global level to address the interoperability requirements and environmental complexities of organizations. For example, IMS, HR-XML consortium, IEEE-LTSC, OMG, and also ISO/IEC JTC1 SC36 itself. Some typical problems encountered by stakeholders or ITLET systems for the management and exchange of competency information are provided in examples below (Hirata & Brown, 2008):

1. At a technical level, learning- and HR-related information cannot always be shared between different learning- and HR-related platforms;
2. At an organizational level, learning- and HR-related information is not easily used in human resources development, because skills and competency information may be detailed or expressed differently in learning- and HR-related systems;
3. At an information level, skills and competency proficiency information, such as individual status of degrees acquired, cannot be shared easily between HR- and learning-related systems;
4. At an individual learner level, individual developmental paths need to be better supported across learning- and HR-related systems;
5. At a systems level (where systems include individuals, organizations, and the technologies that support them), individuals and organizations cannot easily design and integrate informal and formal learning, education, and training opportunities to support life goals, career strategies, and career paths using existing common dimensions within learning- and HR-related systems;

6. At a practical implementation level, learning- and HR-related information needs to be supported by evidence in order to be able to verify individual skills and competency levels and to enable information sharing;
7. Also, at an implementation level, learning- and HR-related systems need to acknowledge and consider evaluation biases in human assessment, the use of varying methods and metrics to evaluate human performance, and the need for accurate skill gap analysis; and,
8. At an overarching level, human assessment and support for the development of human potential requires IT systems that provide a more holistic integration and exchange of information between different learning- and HR-related systems beyond individual learning opportunities, everyday operation, and work performance.

Some of these identified problems have been addressed on a limited basis by the standards and specifications mentioned above, but it is still confusing for stakeholders to implement and use these standards and specifications. Also, various problems related to ITLET related systems, which should be solved by or supported with information technology, still remain.

ISO/IEC JTC1 SC36 has launched several study periods regarding these issues including Competencies and Skills Management Architecture and Managing and Exchanging Participant Information. Approximately 10 NBLOs have made contributions to support the work of SC36 WG3 on this issue, which has helped to identify target issues that need to be resolved. This International Standard is intended to resolve some of these identified problems. Thus, the purpose of this three-part International Standard is to provide a framework, models, system architecture, and guidance regarding competency and its proficiency information, and a way to aggregate competency information. This standard will provide a reference code and protocol to manage and exchange information about knowledge, skills, ability, attitude, or educational objectives. Especially this International Standard will focus on extending the ideas contained within ISO/IEC TR 24763 by providing more detailed information regarding competency information, and its information aggregation. This multi-part standard may be used by software developers, implementers, instructional and test designers, and others to ensure that learning, education, and training environments reflect learners' and organizations' competency needs. In addition, this International Standard will provide definitions of several types of skill and competency aggregation, which will provide guidance for all stakeholders to enhance understanding and support the development of effective systems that will enable competency information exchange.

Programme of work

If the proposed new work item is approved, which of the following document(s) is (are) expected to be developed?

____ a single International Standard

____ more than one International Standard (expected number: .....)

_X__ a multi-part International Standard consisting of ....3..... parts

____ an amendment or amendments to the following International Standard(s) .....

_X__ a technical report , type .2...Part 3 will be a TR.....

And which standard development track is recommended for the approved new work item?

_X__ a. Default Timeframe

____ b. Accelerated Timeframe

____ c. Extended Timeframe

Relevant documents to be considered ISO/IEC JTC1 SC36/WG3 N201, N232, N244, N256, N270, ISO/IEC JTC1 SC36N1916

Co-operation and liaison ISO/IEC JTC1/SC36/WG4, & JTC1/SC36/WG7, IEEE LTSC WG20, IMS, OMG Skills Management SWG, HRML

Preparatory work offered with target date(s) 2011Q4

Signature:
Will the service of a maintenance agency or registration authority be required? ....No..... - If yes, have you identified a potential candidate? ..... - If yes, indicate name ..... Are there any known requirements for coding? ....No..... -If yes, please specify on a separate page Does the proposed standard concern known patented items? . ..No..... - If yes, please provide full information in an annex

Comments and recommendations of the JTC 1 or SC XXSecretariat - attach a separate page as an annex, if necessary

Comments with respect to the proposal in general, and recommendations thereon:
It is proposed to assign this new item to JTC 1/SC 36

Voting on the proposal - Each P-member of the ISO/IEC joint technical committee has an obligation to vote within the time limits laid down (normally three months after the date of circulation).

Date of circulation:	**Closing date for voting:**	**Signature of Secretary:**
2009-12-08	2010-03-08	Charrrry

NEW WORK ITEM PROPOSAL - PROJECT ACCEPTANCE CRITERIA		
Criterion	**Validity**	**Explanation**
A. Business Requirement		
A.1 Market Requirement	Essential _X_ Desirable ___ Supportive ___	There are many skills or competency standards, in the world-wide market, but these standards are not informational, and cannot be easily processed by computers. However, it is essential to create and exchange information regarding skills and competencies for multiple distribution channels, systems, platform, and services to support individual and organizational competency needs.
A.2 Regulatory Context	Essential ___ Desirable ___ Supportive __ Not Relevant _X_	
B. Related Work		
B.1 Completion/Maintenance of current standards	Yes ___ No_X_	
B.2 Commitment to other organisation	Yes _X_ No_ __	OMG and HRML agreed with this ISO work collaboratively.
B.3 Other Source of standards	Yes _X_ No___	IEEE LTSC RCD, IMS RDCEO, HR-XML Competencies
C. Technical Status		
C.1 Mature Technology	Yes ___ No_X_	
C.2 Prospective Technology	Yes _X_ No___	
C.3 Models/Tools	Yes _X_ No___	Model and extensions

D. Conformity Assessment and Interoperability		
D.1 Conformity Assessment	Yes _X_ No ___	This International Standard is required to comply with ISO/IEC TR 24763 as one of extensions for data implementation.
D.2 Interoperability	Yes _X_ No ___	This International Standard intends to support interoperability by providing a model and extensions that can be used by developers, implementers, instructional designers, and others to guide development, implementation, instructional design, and other efforts intended to support learners within learning, education, and training environments.
E. Adaptability to Culture, Language, Human Functioning and Context of Use		
E.1 Cultural and Linguistic Adaptability	Yes_____ No __X___	In-depth technical review is beyond the scope of this report but may be considered at a future date.
E.2 Adaptability to Human Functioning and Context of Use	Yes_____ No __X___	In-depth technical review is beyond the scope of this report but may be considered at a future date.
F. Other Justification		

Notes to Proforma

A. Business Relevance. That which identifies market place relevance in terms of what problem is being solved and or need being addressed.

A.1 Market Requirement. When submitting a NP, the proposer shall identify the nature of the Market Requirement, assessing the extent to which it is essential, desirable or merely supportive of some other project.

A.2 Technical Regulation. If a Regulatory requirement is deemed to exist - e.g. for an area of public concern e.g. Information Security, Data protection, potentially leading to regulatory/public interest action based on the use of this voluntary international standard - the proposer shall identify this here.

B. Related Work. Aspects of the relationship of this NP to other areas of standardisation work shall be identified in this section.

B.1 Competition/Maintenance. If this NP is concerned with completing or maintaining existing standards, those concerned shall be identified here.

B.2 External Commitment. Groups, bodies, or for external to JTC 1 to which a commitment has been made by JTC for Co-operation and or collaboration on this NP shall be identified here.

B.3 External Std/Specification. If other activities creating standards or specifications in this topic area are known to exist or be planned, and which might be available to JTC 1 as PAS, they shall be identified here.

C. Technical Status. The proposer shall indicate here an assessment of the extent to which the proposed standard is supported by current technology.

C.1 Mature Technology. Indicate here the extent to which the technology is reasonably stable and ripe for standardisation.

C.2 Prospective Technology. If the NP is anticipatory in nature based on expected or forecasted need, this shall be indicated here.

C.3 Models/Tools. If the NP relates to the creation of supportive reference models or tools, this shall be indicated here.

D. Conformity Assessment and Interoperability Any other aspects of background information justifying this NP shall be indicated here.

D.1 Indicate here if Conformity Assessment is relevant to your project. If so, indicate how it is addressed in your project plan.

D.2 Indicate here if Interoperability is relevant to your project. If so, indicate how it is addressed in your project plan

E. Adaptability to Culture, Language, Human Functioning and Context of Use

NOTE: The following criteria do not mandate any feature for adaptability to culture, language, human functioning or context of use. The following criteria require that if any features are provided for adapting to culture, language, human

functioning or context of use by the new Work Item proposal, then the proposer is required to identify these features.

E.1 Cultural and Linguistic Adaptability. Indicate here if cultural and natural language adaptability is applicable to your project. If so, indicate how it is addressed in your project plan.

ISO/IEC TR 19764 (Guidelines, methodology, and reference criteria for cultural and linguistic adaptability in information technology products) now defines it in a simplified way:

“ability for a product, while keeping its portability and interoperability properties, to:

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

- take into account the usual needs of any category of users, with the exception of specific needs related to physical constraints”

Examples of characteristics of natural languages are: national characters and associated elements (such as hyphens, dashes, and punctuation marks), writing systems, correct transformation of characters, dates and measures, sorting and searching rules, coding of national entities (such as country and currency codes), presentation of telephone numbers and keyboard layouts. Related terms are localization, jurisdiction and multilingualism.

E.2 Adaptability to Human Functioning and Context of Use. Indicate here whether the proposed standard takes into account diverse human functioning and diverse contexts of use. If so, indicate how it is addressed in your project plan.

NOTE:

1. Human functioning is defined by the World Health Organization at http://www3.who.int/icf/beginners/bg.pdf as:
   <<In ICF (*International Classification of Functioning, Disability and Health), the term functioning refers to all body functions, activities and participation.>>*
2. Content of use is defined in ISO 9241-11:1998 (*Ergonomic requirements for office work with visual display terminals (VDTs) – Part 11: Guidance on usability) as:*
   <<Users, tasks, equipment (hardware, software and materials), and the physical and societal environments in which a product is used.>>
3. Guidance for Standard Developers to address the needs of older persons and persons with disabilities).

F. Other Justification Any other aspects of background information justifying this NP shall be indicated here.

1) Bridging across different LMSs

IT systems that support learning, education, and training need to support individuals who may have a variety of different roles within an organization or within different organizations. For example, an individual may be a student, instructor, and a system administrator at the same organization. As learners belong to several organizations, changing from a certain organization to another, they may be assigned to different departments or work on various projects, and be supported by a number of ITLET suppliers and systems at the same period and during their life. Learners may refer, learn, and be assessed within various contexts, with different content, and by varying metrics of knowledge, skills, competencies, etcetera. Also, learning records and profiles need to be able to be used across various ITLET systems.

From the perspective of learning courses and material, learning courses and materials should be assigned to appropriate learners and fulfil learners' individual needs in an appropriate and efficient manner that provides needed support. At the same time, organizational requirements need to be met. Needs analysis and skill gap analysis are significant to support both individuals and organizations. Semantic information related to skills and competencies may be helpful to indicate, analyze, and match learning courses and activities, learners' needs, and organizational requirements.

It is essential that ITLET systems support individuals in a manner that respects privacy, supports the development of individual human potential, and advances organizational goals in an efficient manner.

2) Harmonizing among different industrial and national standards

Competency information should be used and exchanged not only among different platforms, systems, and services, but also across different regions and nations. This means that several existing data types, information models, frameworks from industry, national and regional standards need to be considered and ways forward to promote interoperability need to be provided.