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Information technology for learning, education and training — A reference framework of e-Portfolio information

Techonologies de l'information pour l'apprentissage, l'éducation et la formation — Un cadre de référence pour l'information des e-Portfolios

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 36, *Information technology for learning, education and training*.

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Introduction

e-Portfolios have been deployed in many contexts that span educational, employment, artistic, and social contexts. In education, they have demonstrated their potential to enhance the development of learners and to support the work of educators, administrators, and others, through streamlining information management processes, developing learner autonomy and metacognition, and fostering the personal and professional development of individuals. However, this broad implementation has also brought with it issues related to interoperability, accessibility, and usability of both systems and content.

This Technical Specification has been developed to support the creation and use of e-Portfolios to support learning, education and training. It can be used to develop more responsive, flexible and modular systems and services that will support learners, instructors, e-learning service providers and other stakeholders in their activities related to e-Portfolio creation and use across various ITLET contexts (such as K-12 education, higher education training, career planning and professional development). With on-going developments in ICT learners have access to an increasing diversity of learning, education, and training opportunities. Production of educational content and services as a consequence of developments in ICT extends the scope of opportunities for learning, providing potential for learners to experience personalized and adaptive opportunities that also may enhance their learning and improve their abilities. Content and services are delivered to or accessed by learners – as well as produced and managed by them. ITLET systems therefore need to be designed to accommodate this. For example, a common feature of *most* e-Portfolio systems is that their owners not only author the content but also control selection and presentation of it. In some jurisdictions this key function is seen as integral to personal development planning (PDP).

A key characteristic of e-Portfolio systems for ITLET stakeholders is the data or information that is utilized for e-Portfolios can provide instructors, trainers, administrators, and employers with an efficient means of appraisal, management, and decision making. This key characteristic also benefits learners through providing opportunities to reflect on their own learning and career development. e-Portfolios thus provide an opportunity to monitor the development of an individual's achievements, skills and competencies within and beyond formal education and training contexts.

One means of delivering such functionality is via a management system, such as an integrated Learning Management system (LMS) or Human Resource management System (HRMS) that can be used to monitor and organize learners' learning; however, unbundled applications and services can also provide such functionality and components of e-Portfolio system functionality can exist in a highly distributed manner.

For these reasons, implementing e-Portfolios has the potential to be an efficient method for tracking learning history, documenting activities within learning, education, and training, supporting peer and self-assessment as well as professional development in the workplace. Consideration of how e-Portfolios may be used within teaching and learning environments has therefore been central to shaping this document.

In order to encourage streamlined management and exchange of participant information and associated data, such as the evidentiary information contained in an e-Portfolio, a standardized approach is necessary. Through the standardization of e-Portfolio system components (that is, IT systems and services that enable e-Portfolios), common underlying structures will provide the potential to share data across and among different applications, thus improving interoperability.

This Technical Specification provides a reference framework for the use of e-Portfolios within ITLET contexts where there are requirements for importing, exporting, and aggregating data. The reference framework has been developed with the aim of supporting interoperability and transfer of information among ICT systems and services where data interchange is required for e-Portfolio systems. It is intended to be used by learners, instructors, software developers, implementers, instructional designers, and others within learning, education, and training environments that are supported by information technology.

This Technical Specification includes six clauses and two annexes. The first clause provides the scope, exclusions, and aspects not currently addressed. The second and third clauses include the normative references and terms and definitions respectively. The fourth clause provides background information regarding e-Portfolios. The fifth clause describes various types of e-Portfolios used in learning, education, and training contexts and provides an approach to classifying them. The e-Portfolio reference framework

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is then detailed in clause six. The annexes include use case information that has been submitted by national bodies (Annex A) and study cases of e-Portfolio interoperability (Annex B).

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Information technology for learning, education and training — A reference framework of e-Portfolio information

1 Scope

This Technical Specification details a reference framework of e-Portfolio implementation that can be used to inform and support development of ITLET systems that meet the requirements of learners, instructors, e-learning service providers and others in contexts such as K-12 education, higher education, training and development.

The reference framework identifies content and functional components that support e-Portfolio systems and interoperability issues that need to be addressed in data exchange between these components and interoperability issues that need to be addressed in data exchange between the two component types (content and functional) and among the various categories.

This Technical Specification:

— provides an e-Portfolio reference framework;

— provides descriptions of e-Portfolios in terms of components, categories, and elements;

— provides descriptions of e-Portfolios in terms of component types (content or functional), categories, elements, and items;

— identifies commonalities of current implementations of e-Portfolios; and,

— represents the needs of stakeholders (e.g. learners, instructors, etc.).

The scope of this Technical Specification does not include:

— in-depth technical review of issues related to adaptability to culture, language, and human functions;

— security techniques related to the protection of privacy information;

— authentication of the identity of an IT or ITLET system user;

— how e-Portfolios might integrate with ITLET systems; and

— specific requirements of e-Portfolios or e-Portfolio systems to meet jurisdictional domain requirements.

This Technical Specification currently does not address:

— aspects of accessibility.

— the elements required of learner and instructor;

— best practices of e-portfolio use cases in the fields on K-12 education, higher education and training;

— guides to support the use of e-Portfolios in learning, education, and training environments; and

— detailed technical information regarding specific types of e-portfolios (e.g. learning, teaching, assessment, presentation, personal development, career, course, program, institutional, or other).

It is anticipated that some or all of these requirements may be addressed in future editions of ISO/IEC 20013, or in companion International Standards or Technical Reports.

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2 Terms and definitions

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

2.1
category
types of *components* (2.2)

2.2
component
set of constituent parts that comprises an *e-Portfolio* (2.5)

Note 1 to entry: An e-portfolio component may be either a content component or a functional component.

Note 2 to entry: A content component makes learner information explicit so that it can be matched to resources. The following are content components for e-portfolio information: identification, synopsis, education, career, outcomes, capability, and experience.

Note 3 to entry: A functional component is used to identify and support interoperability and may include "layers" of entities such as business requirements and processes, technical services, and data sources.

[SOURCE: ISO 16175-2:2011, 3.7 Modified: in the definition, "a digital record" has been replaced with "an e-Portfolio"; the 3 Notes to the entry have been added.]

2.3
e-learning
learning (2.9) facilitated by information and communications technology

[SOURCE: ISO/IEC 24751-1:2008, 2.18]

2.4
element
unit of data for which the definition, identification, representation and permissible values are specified by means of a set of attributes

[SOURCE: ISO/IEC 6523-1:1998, 3.3]

Note 1 to entry: A component can contain one or more elements.

Note 2 to entry: An element is part of the e-Portfolio framework and a label to indicate a layer within the e-Portfolio framework. An example is *Career Planning*, which is an element of the category of *Experience*.

2.5
e-Portfolio
collection of digital items aggregated within an *IT system* (2.7) used for a diversity of purposes to support LET and professional development activities through automated and manual means and is used for a diversity of purposes

EXAMPLE An e-Portfolio may be used:

a) to store personal or professional electronic artefacts;

b) as a personal or professional journal to support reflective learning;

c) as a collation of evidence of learning, experience, and achievement;

d) to support lifelong learning and on-going transitions between education and workplace environments;

e) to support collation and integration of informal learning into formal settings; and,

f) to present selected views of content to prospective and existing employers and educators.

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