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Information technology — Learning, education and training — Learning environment components for automated contents adaptation

Technologies·de·l'information· — ·Apprentissage,·éducation·et·for mation·---·Composantes d'un milieu propice à l'apprentissage pour l'adaptation des contenus automatisée

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Foreword

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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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 36, *Information technology for learning, education and training*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Mobile learning is a term used to describe education conducted via digital learning environments where mobile devices are used. It is an evolved form of education that exploits the functionality and convenience provided via computers and the Internet. Mobile learning allows students to participate in classes via various devices regardless of the student's location, free from traditional time constraints while engaged in daily life. Providing content optimized for the student is the most important element of mobile learning, however, there is an exponentially increasing amount of customized educational content, often with the same context available. This content is increasingly created and shared in mobile learning environments that need to support many different device types. Content providers should be aware of various characteristics of user devices and learning environments so that they can provide optimized content. In order to select content meeting the requirements of both the end users' devices and the learning environment, profile data and metadata that describes the characteristics of those devices and learning environments is used.

This document describes a learning environment profile to support the establishment of mobile learning environments and defines a standard set of terms used to express device information and learning environments for mobile learning. It aims to energize a mobile learning market that is tailored to meet individual student's needs by allowing them to receive recommendations on, and use suitable content for, both their devices and learning environments.

This document contains two methods:

— The profile expression method is a technical method of displaying device information language that includes definitions of schema and vocabulary.

— The profile grouping method is a technical method of grouping and displaying terminal information language that includes a group profile example.

The standards herein express basic information needed to function successfully across different devices and environments. These standards will help establish a foundation for successful delivery of mobile learning.

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Information technology — Learning, education and training — Learning environment components for automated contents adaptation

1 Scope

This document specifies two methods for adaptive content automation. Firstly, a learning environment profile for the expression of device and learning environment information required for mobile learning providers of both content and services, and for effective use of such services. Secondly, a grouping method is specified so that similar learning environment profiles can be bound into one and expressed collectively.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
attribute
item that describes data elements that a resource description framework (RDF) contains

Note 1 to entry: Each attribute is related to a value or resource.

3.2
component
element that classifies *CPI* (3.3) at a high level

EXAMPLE UAProf, HardwarePlatform, SoftwarePlatform, NetworkCharacteristics, WAPCharacteristics, and BrowserUA, CommonCharacteristics, HardwarePlatform, SoftwarePlatform, NetworkCharacteristics, UserAgent and UsageEnvironment.

3.3
CPI
capabilities and preference information
item that contains the function of device, operation and network environments, student information, etc.

3.4
profile
instance by *schema* (3.8) that has all *attributes* (3.1) of a device, network and learning environment

Note 1 to entry: This profile will have all vocabularies available in the *schema* (3.1).

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3.5
profile repository
repository where the *profiles* (3.4) are collected and stored

Note 1 to entry: A profile is usually saved in a resource description framework (RDF) file.

3.6
property
characteristic expressing the capability of the resource

Note 1 to entry: Resources may have many properties.

3.7
resource
objective or element expressed in RDF format

Note 1 to entry: Resource description framework (RDF) resource is usually expressed in uniform resource identifier (URI).

3.8
schema
RDF format *vocabulary* (3.11) created to express the *resource* (3.7)

Note 1 to entry: Schema contains only meaning (structural) information of REF data model, and does not have any values.

3.9
user
individual (student or teacher) or a group that acts as an individual

Note 1 to entry: A user will authenticate his or her identity in order to access resources or content from the server.

3.10
user agent
browser or program that operates in *users'* (3.9) devices

Note 1 to entry: In the mobile learning environment, user may express *CPI* (3.3) anywhere, anytime, by using various user agents.

3.11
vocabulary
set of terms used to express *CPI* (3.3)

Note 1 to entry: Vocabulary is related to *schema* (3.8).

Note 2 to entry: Profile vocabulary for mobile learning devices include device functions and network characteristics.

4 Learning environment profile

4.1 Components

4.1.1 Common characteristics (CommonCharacteristics)

A set of common attributes related to users' devices. Each device has, common attributes (the attributes commonly needed to select a content), such as character set, language, local time, supported content type, etc.

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