Learning platform functional requirements
Version 1

Contents

1. Introduction

This document is part of the British Educational Communications and Technology Agency (Becta) learning platform framework project. It presents a set of functional requirements for learning platform software and systems to be used in schools in England.

The focus of this document is on functional requirements that can be supported by the application of technical standards and specifications that support interoperability. It covers parts of the learning services and data services components of Becta's national digital infrastructure. Beyond the scope of this document are requirements for connectivity and institutional infrastructure.

A learning platform is not expected to be a single product but rather a collection of interoperable systems or modules from different suppliers. Each may perform discrete functions, but collectively they should deliver the requirements described below.

This document has a partner document entitled *Learning platform technical specifications* (publication date June 2006) which describes the technical specifications and standards relevant to each requirement, and their level of obligation, in other words, mandatory or recommended. To access related documents, please visit the specifications section of Becta's Industry and developers website [http://www.becta.org.uk/industry/specifications].

2. Structure

Requirements and specifications are dealt with under broad document headings. The following are broad categories to be used for paragraph headings to simplify documents. Any item is only described under a single heading even though it may impact across more than one area (for example, curriculum metadata may be important in content management, curriculum planning and learner engagement).

2.1 Content management

It is intended that the learning platform functional requirements should not be biased towards a model of content delivery and will also encourage creativity and collaboration. Nevertheless, the requirement to manage content is an important one.

Content management includes the storage and delivery of digital learning resources. The content management requirements build upon those identified in the Becta learning platform conformance regime (which has now closed). They include run-time interactions of the platform with the content, plus content packing and unpacking. The specifications used will be partly based on SCORM (Sharable Content Object Reference Model), one of the key foundations of international e-learning standards that is focused upon single-learner, self-paced, online learning.

3 May 2006
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http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 3 of 11

2.2 Curriculum mapping and planning

Curriculum mapping refers to the ability of the platform to be able to use a curriculum, in particular the National Curriculum for England, as a basis of search, navigation, assessment and learner tracking. This will include curriculum metadata (ingestion, creation and export) and navigation structures. This will also include the ability to customise interfaces, learning design and provision of personalised learning experiences. The learner should have control as appropriate and should be easily able to create and share resources.

2.3 Learner engagement and administration

There are many aspects to learner information management, including portfolios of learner artefacts, pupil enrolment records and interactions between various management systems.

Financial and other management information is beyond the scope of a learning platform but it is expected that there will be some components that require integration with systems that provide management of broader administrative information.

2.4 Tools and services

There is a wide range of tools and services that can be provided as an integral or supplementary part of a learning platform. These will include, for example, collaborative workspaces and interactions with other systems such as the Curriculum Online portal via web services. [http://www.curriculumonline.gov.uk/}

3. Requirements

Each requirement is indicated as mandatory or recommended. The use of the word 'shall' indicates mandatory and 'should' indicates recommended but optional. 'Could' is used to provide illustrative examples of how requirements might be met rather than to indicate mandatory or recommended requirements.

O = obligation   M = mandatory   R = optional but recommended

3.1 Content management

Requirement name	O	Description	Notes
R1: Assessment items	M	Assessment items shall be loaded and used.	Platforms shall be able to deal with assessment items including those meeting selected open specifications that define question types and how they can be delivered.
R2: Launch resources	M	The user shall be able to launch digital content via a web browser or other application.	Specified World Wide Web Consortium (W3C) specifications shall be supported, including being able to use the hypertext transfer protocol (http) and the hypertext markup language (html). The appropriate e-Government Interoperability Framework requirements shall be met. Filtering systems that block the receipt of inappropriate materials and access to undesirable websites should be enabled but this is largely the responsibility of the ISP.
R3: Load content objects	M	It shall be possible to load, store and make sharable content objects available to users. Run-time interactions with content objects should be supported. This includes being able to load bundled resources (content packages) and unpack them.	Parts of the SCORM specification shall need to be supported.
R4: Load resources	M	It shall be possible to load digital content into a storage area that can be presented to learners and accessed via the platform interface.	The appropriate file type requirements in the e-Government Interoperability Framework shall be met.
R5: Metadata creation	M	Users shall be able to classify and tag resources.	If metadata is to be shared a profile of the Curriculum Online format shall be used. It is recognised that in order to keep tagging simple not all elements will be needed. Other metadata schemes may be used. It should be possible for local information to be recorded and used and for metadata to be created socially (for example, folksonomy).

3 May 2006
© Becta 2006

http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 5 of 11

Requirement name	O	Description	Notes
R6: Metadata import and display	M	It shall be possible to load and store metadata records and display information derived from them to the user.	There are various possible metadata formats including Curriculum Online and e-Government Metadata Standards (eGMS). It is recognised that there may be a range of metadata provided and it may not be possible to provide consistent information.
R7: Resource creation	M	Users shall be able to create new resources, integrate them with the platform and export them.	It is important that learner can be engaged with digital tools as well as have access to ready-made content. This could include collaborative resource creation, bookmarking and creation of annotations or ratings.
R8: Coursework	R	Schools should be able to submit pupils' coursework (formally agreed and accredited units of study) to examination bodies in an agreed format.	There is no currently agreed specification although some formats have been produced for specific cases. This is also dependent on other issues such as non-repudiation and security. Consideration should also be given to submission of coursework to colleges or for use in a portfolio.
R9: Cross device	R	Resources should be made available to a range of devices.	There is increasing use of various devices to support learning. These will be determined by the context but could include mobile devices such as PDAs and cell phones.
R10: Identifiers	R	Globally unique identification namespaces should be interpreted and managed.	Identification of resources and individuals should be unambiguous. The platform should support the W3C Uniform Resource Identifier (URI) format and specified coding schemes such as the Unique Pupil Number.
R11: Resource lists	R	Lists of resources should be made available in a shareable format.	Reading lists could be exchanged or shared both within and across schools, and with other users and the community.
R12: Syndicate content	R	Users should be able to combine data-streams and selectively share them with others.	Data could be gathered from personal or class-based web logs, news sites and subject-based blogs, podcasts, vodcasts or newsfeeds and sites and distributed as 'remixes' or 'playlists'.

3 May 2006
© Becta 2006

http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 6 of 11

3.2 Curriculum mapping and planning

Requirement name	O	Description	Notes
R13: Accessibility	M	The platform interface shall be accessible to users.	It is the responsibility of a platform provider to ensure accessibility guidelines are followed and that legislation such as the Disability Discrimination Act is adhered to. A detailed set of guidelines for accessibility is not considered to be within the scope of this framework and full Web Accessibility Initiative (WAI) AAA requirements may be too restrictive. Requirements for learners and administrators may vary. It is recognised that the platform provider may not have control over the accessibility of content. However, WAI AA level requirements should be met by platform modules.
R14: Assessment for learning	M	The platform shall enable learners to be provided with assessments and diagnostics to support learning plans.	This should include self-review and peer review.
R15: Customisable interface	M	The user interface shall be capable of being customised to adapt to the learner's preferences.	This should include learner interface preferences and accessibility requirements. The user shall be able to change the screen colours, font and font size.
R16: Lesson planning	M	It shall be possible for teachers to produce and manage lesson plans.	HTML or other open formats should be used. A lesson plan specification could be developed in collaboration with all the major stakeholders and it could then be possible to share plans more widely.
R17: Navigation and search	M	Curriculum information shall be used to search for and to navigate to resources within the platform.	A recognised curriculum format shall be used. In particular specified Curriculum Online structures shall be used. Metadata and Topic Maps offer possible ways to express these structures.
R18: Personalisation	M	Users should be able to personalise their learning experience.	This should include using a learner profile to adjust the resources that are presented. The platform should also allow the learner to select aspects of their own learning journey.

3 May 2006
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http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 7 of 11

| R19: Sequence resources or activities | M | Users shall be able to create structured units and sequence learning resources or activities. | Users should have the ability to use conditional rules that can change the learning experience depending on behaviour. This should include sequencing controlled by the content, teacher or pupil. |
| R20: Metadata harvesting | R | The platform should be able to retrieve metadata instances from distributed repositories. | The platform should have the functionality to query repositories. The Curriculum Online portal is expected to be one example. |

3 May 2006
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http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1
page 8 of 11

3.3 Learner engagement and administration

Requirement name	O	Description	Notes
R21: Access off site	M	Users shall be able to access the learning platform away from the organisation.	The intention is to enable anytime anywhere access and to include all types of users including teachers, pupils and parents. It is recognised, however, that this depends on access to an appropriate infrastructure and upon the license conditions for some published resources.
R22: Authentication	M	Users shall be uniquely identified and verified.	There should be a consistent approach to authentication; for example, every user may have a unique user name and password linked to individual or group roles and privileges and can easily access other systems. Common systems, including Shibboleth, should be used. Providers should take steps to avoid unauthorised access.
R23: Consistent learner information	M	Learner information shall be consistent throughout the platform	There should be minimal duplication of information and processes should be automated to avoid errors and inconsistencies. A hub integration model could be adopted that allows data to be shared and managed across several systems. Learner information could alternatively only be accessed through a single shared service.
R24: Data protection	M	All stored data shall be secure.	Conformance with current legislation and the requirements of the Data Protection Act for personal data shall be required.
R25: Groups and roles	M	It shall be possible for users be allocated to one or more groups and assigned roles.	Roles and permissions affect how users can interact with the platform. Roles include, for example, administrator, teacher, parent or pupil.
R26: Information access	M	Users with privileges shall be able to access appropriate information.	This could include management information exchanged transparently between systems that may be outside the platform. This could also include support for selective disclosure by electing to share information or resources with other users.
R27: Learner information export	M	It shall be possible for learner information to be exported from the platform.	This shall include support for the provision of statutory information to the DfES or other authorities.
R28: Learner information Import	M	It shall be possible for learner information to be imported to the platform.	This shall include support for transfer of learner records between institutions.

3 May 2006
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http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 9 of 11

Requirement name	O	Description	Notes
R29: Portfolios	M	Users shall be able to create and maintain portfolios for sharing content and to support personal development.	This kind of functionality is sometimes provided as part of an e-portfolio. But 'e-portfolio' has various definitions and there are several functions that can be provided, possibly via links to a range of web services. Portfolios could include goal setting, identifying interests and learning plans. It is expected that there will be further work to help clarify e-portfolio functionality.
R30: Scheduling	M	Access to resources shall be controllable.	Access may depend upon time constraints or be linked to other events. For example, access to a task may be dependent upon successful completion of another task or only be available for a set time linked to a timetable.
R31: Tracking	M	Facilities shall be provided to track learners' support needs and performance.	This shall include reporting whether a learner has completed a particular resource or could include more complex scores or assessment data. Tracking information should be used to provide feedback to learners.
R32: Usage data	M	Information about individual and group usage of the resources shall be available.	Reports shall be generated that summarise how and when the platform and resources are used.
R33: Attendance	R	Support should be provided for the measurement and reporting of attendance.	For example by providing interfaces to support attendance recording by teachers, or integration with automated attendance or tracking devices.
R34: Self-organisation	R	Users should be able to organise and annotate resources.	This should include categorising and making connections, bookmarking, playlists, adding their own comments, tags and ratings. These could be shared with others.
R35: Timetabling	R	A timetable, or an interface to one, should be supported.	This could be linked to a personalised learning space and scheduling of resources.

3 May 2006
© Becta 2006

http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 10 of 11

3.4 Tools and services

Requirement name	O	Description	Notes
R36: Discussion forums	M	Users shall be able to take part in discussion forums by posting and reading messages.	Both intranet and internet services could be considered and desktop clients as well as web clients. Forums should be manageable, for example, for a particular group for a set period.
R37: Rights management	M	Functionality shall be provided that supports and recognises licensing conditions.	This may be simply to inform the user of any rights. The ability to tag user created resources with rights information, including Creative Commons licences, shall be possible,
R38: Web services	M	The platform shall be capable of transparently interacting with web services using standard protocols.	This requirement does not at this stage specify particular services, just that there is capability to meet web services protocols when they are required. For example, users could search the Curriculum Online portal from within the platform if this functionality is made available.
R39: Audio-visual conferencing	R	Audio- and video-conferencing should be supported.	This should enable voice or visual communication with peers or teachers, for example using voice over internet protocol (VOIP).
R40: Blog	R	Users should be able to create web logs.	This could include a facility for multimedia entries and integration of an e-portfolio with selective disclosure.
R41: Email	R	One-one and one-many messaging should be facilitated.	Email, or a system that is like email, should be available to users for sending and receiving. This should include sending messages to lists of recipients. Though this is likely to be the responsibility of the ISP, a platform should be able to integrate with email.
R42: Knowledge construction	R	Knowledge construction tools should be available.	These should include collaborative tools, such as Wikis, that allow for the shared editing of content. The tools may be within or outside the platform.
R43: Messaging	R	Users should be able to send messages to individuals and groups of users.	Sending SMS text messages to mobile phones should be supported. The messages could be multimedia as well as text.
R44: Other activities	R	Support for non-teaching activities should be provided.	Tools for managing teaching activities should be flexible and usable for non-teaching activities, created and managed both by teachers and pupils as appropriate. Activities could include sports teams, clubs and societies, community action and student projects.
R45: Resource syndication	R	Syndicated content, such as newsfeeds, should be supported.	This should include output, as well as input, of content.

3 May 2006
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http://www.becta.org.uk/industry
Learning platform functional requirements
Version 1

page 11 of 11