

# Redoit™ Application

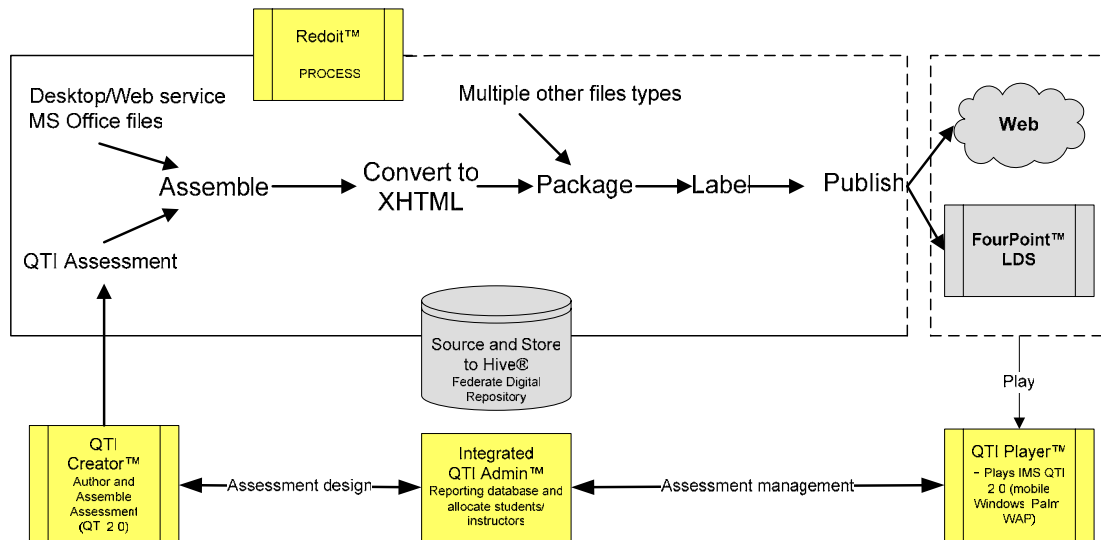
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## Redoit™ Research and Development Project

The Redoit™ (R&D name) process is outlined below.



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The Redoit™ process will bring together previously separate workflows (and expenses) relating to packaging QTI assessments and SCORM and IMS content packaging, labelling and sequencing specifications. The use of IEEE Learning Object Metadata (LOM) standards has advanced to such a point the Testbed partners can undertake development to ensure IMS, QTI and SCORM are integrated. This means we can maximise:

- Interoperability between LMS/CMS';
- Reuse of content on different LORs/LCMS';
- Interchange, assembly and disassembly of objects;
- Package and publish into templates and modes that can be changed to suite user needs (i.e. accessibility), mode of delivery (i.e. Mobile), location or deliverer (i.e. different branding), and pedagogies (i.e. adaptive approaches);
- Reporting across multiple applications and systems within an enterprise or across the learning supply chain;
- Recognition while removing the need to re-keying data relating to recording learning, knowledge, performance, compliance, and other HR or related requirements; and
- Value of intellectual property through labelling of all objects in a relationship to their use and knowledge capital value to the organisation.

### Timelines

- Build commences in February 2005.
- Beta version will be available in first week April 2005.
- Downloads and user acceptance trials will commence late April 2005.
- Project sign off after acceptance testing July 2005.

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## What is the Knowledge Exchange Testbed?

The TKE testbed is a project of The Institute for Working Futures and its e-learning research partners. Located in Melbourne and Launceston, in Australia, it explores building an integrated end-to-end learning and knowledge exchange. Key activities include developing tools to produce or convert existing Microsoft Office® and other common digital content into compliant IMS and SCORM packages that thence promote accessibility, mobility, assessment, and integrate reporting across LMS and other enterprise applications. The TKE testbed is vendor neutral and does not endorse any one product. It does however use the best of breed open standards technologies to provide an advanced elearning solution. This technology is used to undertake applied research projects and provide proof of product on emerging ways to enhance learning and knowledge capital development.

One of the first research projects undertaken in the testbed has concentrated on workflows associated with content assembly and/or conversion and authoring. The objectives that have been validated in the period to March 2005, include determining if it is possible to:

- Streamline assembly, authoring, creation, conversion, and loading of Microsoft Office developed files into SCORM compliant SCO able to be loaded onto LMS or The Web.
- Convert and repackage legacy content into SCORM and thence manage it on a LCMS /LOR;
- Automate the assembly and/or conversion, and authoring of content using agreed templates that meet compliance standards and LOM metadata application profiles (i.e. SCORM/IMS/ IMS QTI/ VETADTA);
- Maximise multiple modes of delivery/publishing for content developed consistent with (a), (b) and (c) above
- Enable the assembly and/or conversion, and authoring of content and objects consistent with accessibility needs;
- Enable the assembly and/or conversion, and authoring of content for use across small screen devices;
- Take QTI Assessment development processes outside an LMS where assessment is embed within learning objects/resources/activities, and specifically ensure:
  - QTI assessments can be treated as any an 'assessment object';
  - Multiple (more than one) learning object/resource/activity can be tied to one or more QTI assessments and progress in learning made contingent upon successful assessment;
  - Can be imported into learning object/resource/activity
- Ensure QTI Assessments could be accessed on mobile devices connected to the Internet, browser or non-browser based;
- Establish link between knowledge (IP) value captured by an enterprises managing and reporting digital rights, and setting rules and requirements for learning objects/content being sourced and deployed off a single federate digital object repository.
- Integrate data reporting into the LMS with data reported to other enterprise applications (eg. Oracle/Peoplesoft, CRM, EHCMS, ERP, etc.)

## Conversion, packaging and labelling (metadata)

This has been the area where findings with the most profound international importance have been made. Suffice to say in this document it looks possible to integrate:

- SCORM 2004;
- IMS packaging and sequencing;
- IMS QTI 2.0; and
- Potentially other organisational/industry-level vocabularies/fields.

As stated earlier the methodology adopted regarding LOM in the QTI Creator and Redoit packager will mean we can make a serious and, hopefully, successful effort to integrate SCORM and IMS content packaging and sequencing (see the later QTI Assessment R&D section). Image using an automated process to take Word and PowerPoint through to an

integrated package, being sure all labelling meets multiple compliance requirements, and link data to enterprise/organisational-specific tags. We know we can already do this with an Macromedia or MS Explorer generated files. All this can accordingly be produced, edited, accessed, found, stored and therefore managed as an intellectual property (IP) asset off Hive. As use is tracked and capital value reported, so the value of the objects (IP) increases.

## Acronyms, terms and other matters

This section is intended to remove some of the 'noise' associated with some of the terms used in this application.

**QTI** is the **Question and Test Interoperability** specification developed by **IMS** Global Learning Consortium, an international, industry sponsored project. QTI described how tests and their results can be described in XML. QTI version 2 released in 2004. QTI is essential in detailing how to achieve interoperability of assessment instruments and all aspects of data reporting off mobile devices.

**IMS Metadata** is a specification that provides a way to format the **Institute of Electrical and Electronics Engineers (IEEE)** Learning Object Metadata (**LOM**) standard in XML (**eXtensible Markup Language**). IEEE has a key role in setting international standards for electro and information technologies and sciences.

**IMS Packaging** is also a commonly used specification. This specification sets out to describe objects aggregated into packages (i.e. like SCORM).

**IMS Simple Sequencing** is a specification details navigation paths and relationships between objects and collections of resources. This can be coupled with **IMS Learning Design** that establishes how learning objects fit within a learning strategy.

**SCORM** is the **Shareable Content Object Reference Model**. SCORM was developed under the **Advanced Distributed Learning (ADL)** initiative, a joint academic and Department of Defence initiative chartered to address a late 1990's US Federal Government directive to address learning content sharing and management. ADL introduced SCORM 1.0 in 2000, and a series of iterations and enhancements that have now resulted in SCORM 2004. SCORM is not a standard or a specification, but a reference model. It mainly covers labelling for describing data (**metadata**), the packaging of content to specific enterprise application, a messaging and communication system that enables the content to exchange data with enterprise systems or other content objects, and a way to organise content objects into larger assemblies. In 2004, the key content component became the **Activities** and **Sharable Content Object (SCO)**. SCORM is therefore essential in guiding how we source develop, manage and distribute content.

Globally, the combination of SCORM 2004, with IMS QTI version 2.0 (released March 2005) and metadata and packaging specifications has created four **profound and new opportunities** to:

- Design, deploy and manage assessment objects that fit multiple strategies, rather than having to limit strategies if SCORM was used.
- Treat assessment as a SCO (not part of some other object), and have multiple activities tied to one assessment object.
- QTI assessment instruments (assessment objects) can be designed, developed and managed in relation with SCORM thus maximising their reuse, accessibility, discoverability, durability and interoperability (including across multiple enterprise applications such as LMS').
- Most importantly, all data reported from assessment can be managed in XML to the highest security and privacy requirements, across fixed or mobile networks.

For commercial and enterprise systems administrators QTI compliance and roll out over mobile networks is now extremely attractive. It provides a means to conduct both knowledge and learning transfer in a manner that does not 'burden' the existing, often overburdened internal networks. It also can be done in a manner that does no compromise security, commercial and privacy concerns. Additionally there is no need for the LMS to actually reside inside the enterprises' own network. Data can be interchanged in XML from the mobile device to the learning providers' systems and thence, through a very secure, narrow 'tunnel' to the HR, learning, knowledge and related enterprise systems.

**Packaging** relates to:

- Aggregating 'chunks' of content or objects into larger components; and
- Formatting the objects to confirm how they are to be used.

Packaging can confirm not just how content is to be designed and built, but also how it can be accessed (CD ROM, fixed PC connected to the web, PDA, mobile device, etc.), and how it will be presented.

**Labelling** relates to the use of metadata, in effect deployment of LOM and SCORM in assessment and learning objects that are packaged.

**AVETMISS** is the Australian Vocational Educational and Training Management Information Statistical Standard. AVETMISS data reporting is required for VET funded by the government. It requires data be collected on enrolment and on completion of training against standard fields. Applications that do this reporting (i.e. VETTrak) also can be used by providers to generate strategic data and specific reports required by state authorities and agencies.

<b>AICC=</b>	Aviation Industry Computer-based learning Committee
<b>CMS =</b>	Content Management System (Most often used by educational sector instead of LMS)
<b>LMS =</b>	Learning Management Systems
<b>LDS =</b>	Learning Delivery System (LMS with authoring capabilities)
<b>LOR =</b>	Learning Object Repository
<b>LCMS =</b>	Learning Content Management System
<b>EHCMS =</b>	Enterprise Human Capital Management System
<b>CRM =</b>	Customer Relationship Management system
<b>ERP=</b>	Enterprise Resource and Planing
<b>HR=</b>	Human Resource