

# BRIEFING PAPER

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XML for  
Assessments  
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## Introduction

Producing XML standards for assessments is not easy work, as anyone who has been following the development of the [IMS Question & Test Interoperability \(QTI\)](#) specification [will know](#). When the QTI 2.1 was temporarily withdrawn from the IMS standards web site in 2009, the reason given was:

"[the specification] did not achieve sufficient implementation and feedback to warrant being voted on as a final specification."

While some were no doubt dismayed by this about turn, to others this will come as no surprise. We do not use QTI (of any version) at CAPDM **except** as an intermediate exchange format. For example we use QTI as the starting point in the conversion of questions marked up for tools such as Questionmark OnDemand to final formats such as Moodle XML.

But QTI is XML in action, and CAPDM bangs on about using XML. So why doesn't CAPDM use QTI?

UQF not  
QTI

One reason we could offer is that we have been using a particular mark-up long before QTI came about. That's not to say that what we use is outdated: we have evolved this over the years to account for new needs, new structures and new semantics. We call it UQF – or, rather grandly, the Universal Question Format. The only excuse that I can offer for this grand title is that we had to think of a name.

Since UQF started there have been many formats that we could have chosen to use, but our clients use Perception, WebCT, Moodle and a number of other learning and assessment environments. Should we have chosen QML, QTI, or what?

We stuck with our own UQF for one main reason – it is particularly suited to actually marking up questions, and its semantic richness is particularly suited to our strict single source master policy. So there are two immediate advantages to UQF:

- • Single source advantages for long term maintenance and reuse.
- • Assessment engine independence.

There are other big differences between, say, QTI and UQF. Few would claim that QTI is particularly suited for use in actually marking up questions. UQF wins outright here, however UQF is certainly not as **generic** as QTI.

However this very generalness of QTI translates to something more than 'being awkward for authoring', specifically that it becomes quite difficult to enforce a consistent marking scheme and style. This is because QTI says nothing about the format of the actual question content, and because it allows for arbitrary marking schemes to be specified per question. It is difficult enough to get most education authors to think about questions other than multiple choice, it is hard

to get them to create questions that span the Bloomian taxonomy, and it would be near impossible to get them to think about highly varied rubrics and marking schemes.

UQF does not stand alone. It is part of a wider content model. We tend to use XML DocBook as our preferred DTD/Schema and we have extended the base DocBook to include UQF (and for UQF to include DocBook as its basic content model).

DocBook provides a vast number of semantic element tags, and though its origins are as a [semantic mark-up language](#) for technical [documentation](#) – originally intended for writing technical documents related to computer hardware and software – it can be used for any other sort of documentation, including learning materials.

Formative assessments benefit from being richer content, as this facilitates better tuning of answers to the assessment context, better recording of behaviours, and the capture of reflective inputs (to be held as a body of evidence).

DocBook XML's flexibility can also be of great help in encoding higher order Bloomian assessments for syntheses and analysis, perhaps incorporating learning objects such as custom applet and object API. One thing that thinking about having a powerful content model is that this begins to free the programme developers from the abrupt simplicity of the MCQ. Content becomes much fitter for purpose.

Another advantage then for UQF is:

- Richer content models

UQF, QTI, QML etc. merely mark information and materials up, but how do they implement?

As suggested above UQF enjoys an independence from any assessment engine. For this reason we achieve our conversions of QTI (e.g. as an export format from Perception) by taking it first to UQF – for long term storage, management and exploitation – then to Moodle XML (or other final formats).

When used in custom assessment engines – UQF suggests a much more efficient and streamlined database infrastructure than is used in most learning environments. This means that we can render page of questions of a variety of question types with a single database call. This is extremely efficient for a page of say, 10 questions, when compared with a Moodle equivalent. With technical efficiencies, such as database pooling, this helps implementers to achieve scalability.

Content  
ModelsImplementa-  
tions

With a rich content model and a domain wide approach to the management of learning materials, you get a further advantage:

- Support for cross linking to other elements in course materials. For example it is easy to link from an answer back into the relevant section of the core text.

The use of a single, domain-wide mark-up means that anything that looks like a question – whether it is part of a formal question bank or simply a question within a text or a workbook – is actually marked up as a question, but only if you take time and effort to ensure that all content has the correct and appropriate semantic mark-up. This offers another interesting advantage:

- There is the potential for embedding questions as part of core texts or work books.

Finally with an easy to interpret mark-up, coupled with a rich content model there is one final, and rather obvious, advantage:

- It is easier to create good looking, well styled questions in a consistent manner.

## Summary

There is the feeling that we have passed the point where there are just too many standards. This may be a strange thing for a very standards-orientated company to say, but there are standards and there are useful standards that can be implemented. QTI 2.1 was looking very complex – trying to be all things to all people.

We will continue to use UQF (with the potential to output QTI for interchange), and we will certainly continue to use rich XML content models. The two together are important, and when coupled with a highly functional assessment engine they can produce innovative, exciting and demanding assessments.

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