Sheffield Hallam University, participating
in CETIS

Accessibility Aspects of the IMS Question and Test Interoperability Specification

A short overview of current
development

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Ims 質問及びテストインターオペラビリティの指定の入手の可能性の面

問題及び進行中の仕事の短い概観

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Opening Screen

- What is "Accessibility" about (a working definition)
  - (Assessment) in E-Learning systems that do not exclude people with disabilities
  - 1980 UN Estimate 500 million people
  - 1 in 10 Americans, 1 in 10 Europeans
  - Hearing impaired, vision impaired, physical disability …
  - We all get older

- Plan
  - A Quick Example of what QTI can do
  - The context and the QTI response

Before the credits ..

- Accessibility
  - Need for device specific rendering control and flexibility
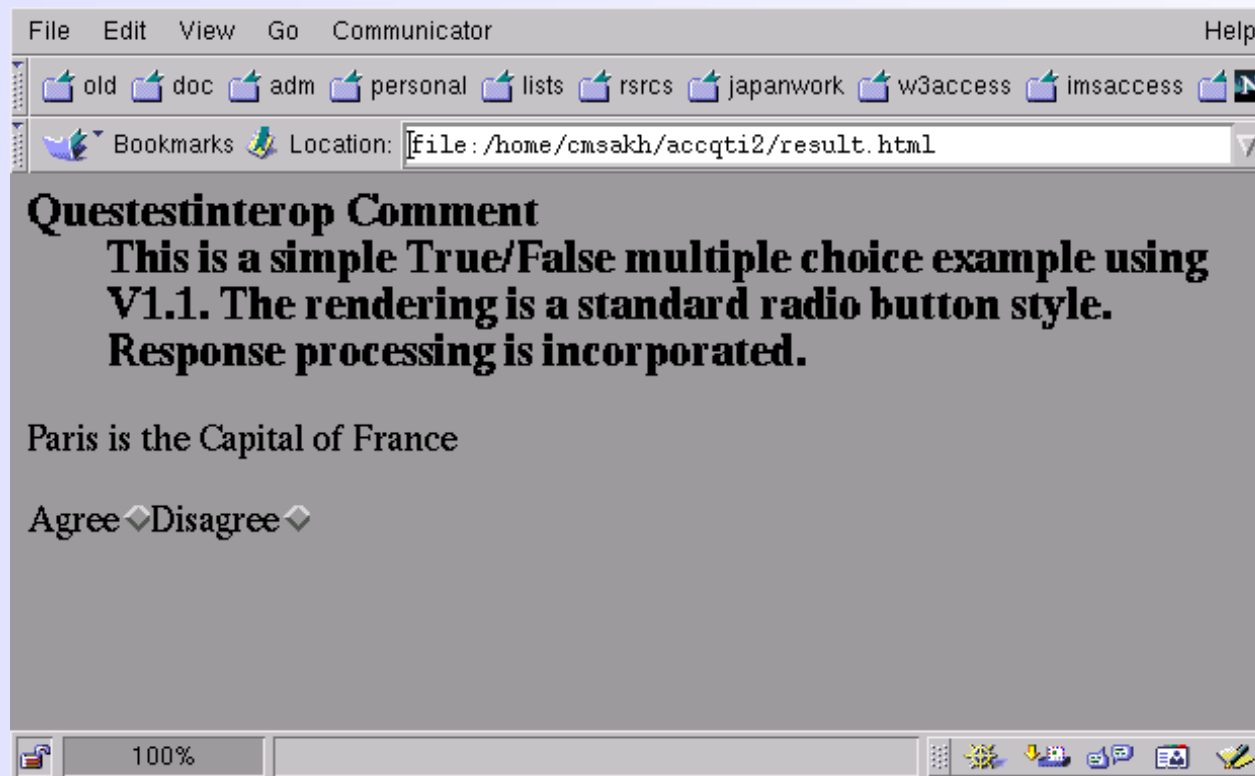
Example from 1.1 specification

.. Before the Credits ..

- Some important tenets:
  - Stylesheets are a good thing
  - Users can have different stylesheets
    - For different times and different devices
  - One input source CAN supply output for different devices

Renderings - inline

```
<material><mattext>Agree</mattext></material>
```
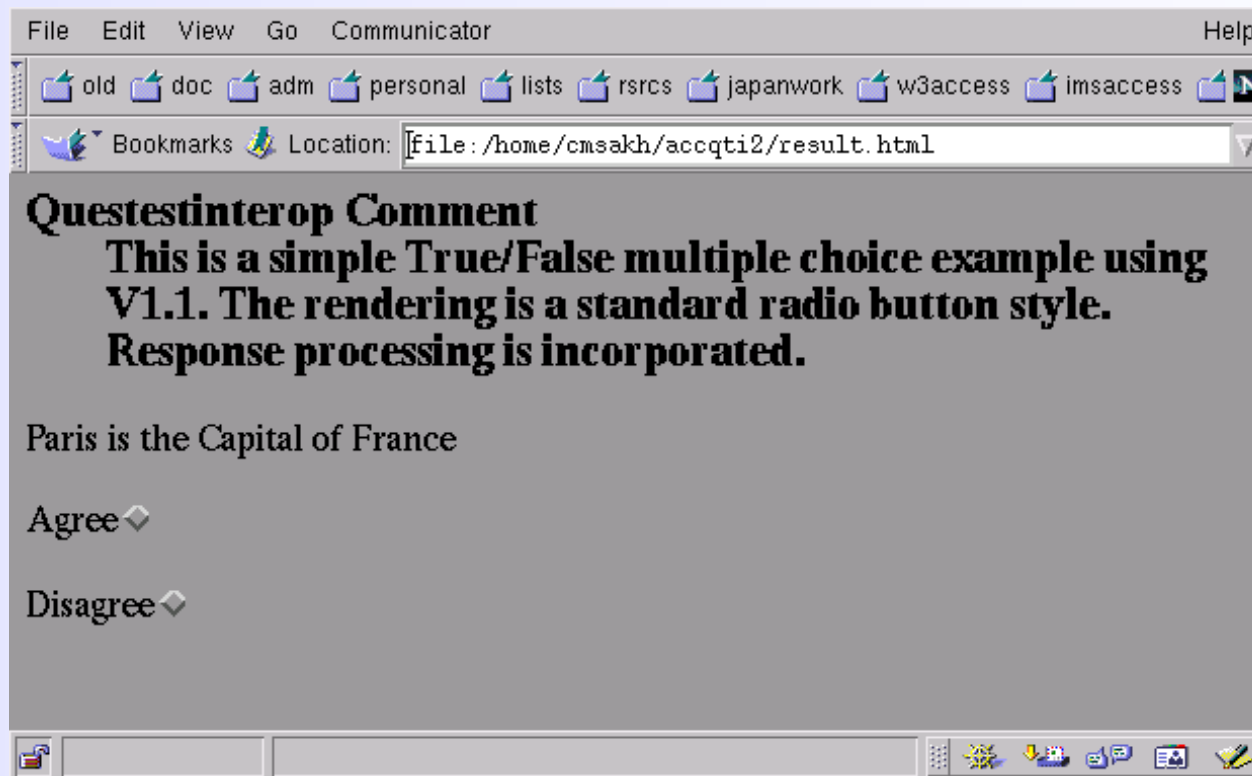
Translation to

html via XSLT

With 4xslt from

www.4suite.org

(Open Source)

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Renderings - block

```
<flow_mat>          <material><mattext>Agree</
mattext></material> </flow_mat>
```

For speech synthesiser

CSS2:

```
P.tfButton { pause-before: 20ms }
```

flow_mat generates the <P class="tfButton">

Different stylesheets for different devices and circumstances.

System or user-selected at run time.

Logical Presentation Hints

```
<flow>
   <material>
      <mattext>Paris is the Capital of France</mattext>
   </material>
   <response_lid ident="TF01" rcardinality="Single" rtiming="No">
      <render_choice>

<response_label ident="T">
         <flow_mat>
            <material><mattext>Agree</mattext></material>
         </flow_mat>
</response_label>

<response_label ident="F">
         <flow_mat>
            <material><mattext>Disagree</mattext></material>
         </flow_mat>
</response_label>
         <flow_label>
         </flow_label>

         <flow_label>
            <response_label ident="T">
               <material><mattext>Agree</mattext></material>
            </response_label>

            <response_label ident="F">
               <material><mattext>Disagree</mattext></material>
            </response_label>
         </flow_label>
      </render_choice>
   </response_lid>
</flow>
```

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XSLT

```
<xsl:template match="render_choice//response_label">
<!--_____-->
<xsl:choose>
<xsl:when test=".//@class='Block'">
    <P class="tfButton">
    <xsl:value-of select="*"/><INPUT type="radio" name="{../../@ident}"/>
    </P>
</xsl:when>
<xsl:when test=".//@class='List'">
    <xsl:value-of select="*"/><INPUT type="radio" name="{../../@ident}"/>
</xsl:when>
<xsl:when test="true()">
<!-- DONT treat as a Block -->
    <xsl:value-of select="*"/><INPUT type="radio" name="{../../@ident}"/>
</xsl:when>
<xsl:otherwise>
<xml:text> DEBUG - contact Andy Heath if this text shows in output
 </xml:text>class is<xml:value-of select="@class"/>
</xsl:otherwise>
</xsl:choose>
</xsl:template>
```

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The Credits – a word from a sponsor

- Centre for Educational Technology Interoperability Standards in UK.

- Mediates between Standards Activity and UK Higher and Further Education - Represents, disseminates, generates activity

- CETIS Special Interest Groups – QTI, Content Packaging, Accessibility, Learner Information Profiles, Meta-data

- I monitor and participate in all groups, notably QTI and Accessibility where I mediate between

IMS Accessibility

- US. National Centre for Accessible Media (NCAM)

- ETS

- Open University UK.

- Blackboard

- CETIS

- DEYTA (Australia)

- Industry Canada

- IBM

IMS Accessibility

- US - Section 508 Rehabilitation Amendments Act 1998 in force.

- UK – Special Educational Needs Disability Bill

- Similar in Australia

  – Content and tools must be accessible to all

- Started Feb 2001
- Scope May 2001
- First Publicly Visible Output August 2001
  – Some results and detail of further work.

IMS Accessibility

GOALS:

- Accessibility built in to the specs
  - Earlier the better
  - Need to predict future work (research vs practice)
- Guidelines for implementation
- Usability testing

IMS Accessibility

- Guidelines for
  - General Accessibility
  - Alternative media delivery and modalities
  - Asynch and Synch Comm & Collab tools
  - Interactive Elements
  - **Testing and Evaluation (including QTI best practices)**
  - Authoring tools

IMS Accessibility

- Specific work underway

  - Media Meta-data recommendations

  - Learner Information Profile Schema

  - Recommendations to Question and Test Group.

- Slightly Longer Time Scale (underway)

  - Implementation Guide(lines)
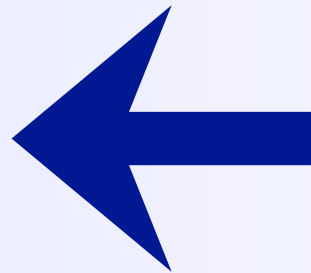
What the spec already does well

- Separates Content and Presentation
  - Separate rendering and response information

  - \<flow>
  - \<flow_mat>
  - \<flow_label>
  - \<matemtext>

Generate/customise presentation at run-time

Flow example

<flow class="Block">

Is it true that the English author H. G. Wells once said

<flow class="Quotation">

When I see an adult on a bicycle, I have hope for the human race
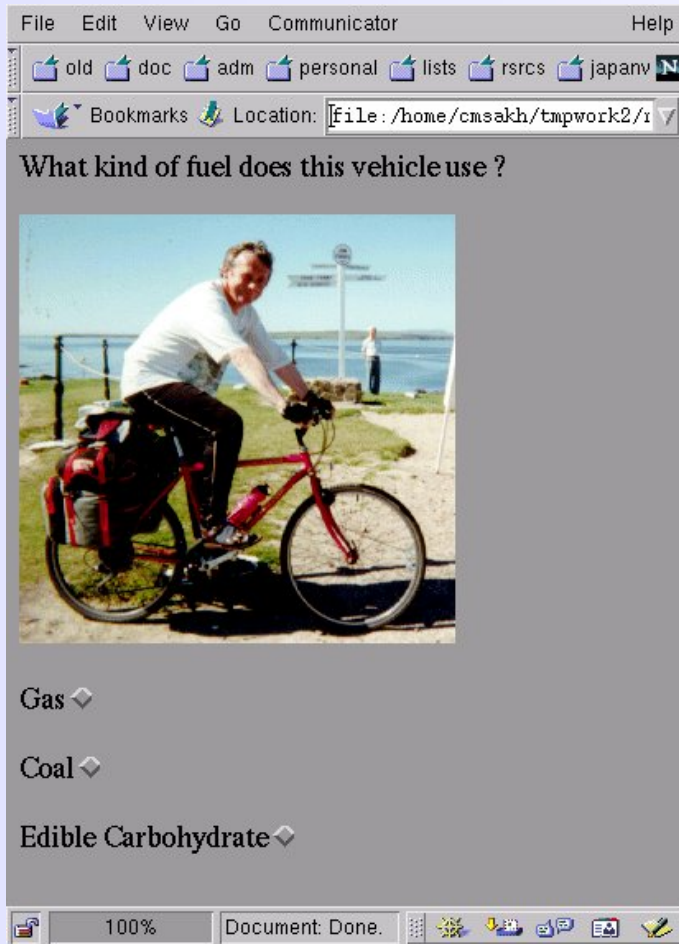
</flow>

</flow>

Could generate a visual layout or auditory clue such as a change of speaker

QTI-Accessibility Summary

- Need for variation at different levels (Alternatives and equivalents)
  - Within items (fine-grained better than coarse)
    - Alternative media
  - Alternative QTI Items

- Validation research
  - What do we know about the equivalence of these media-alternatives or item-alternatives ?
    - Tracking information - ASI and Results Spec ?

- Style-sheets and implementation examples of QTI, guidelines, real evaluation (Accessibility spec)

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QTI Accessibility


```
<material> What kind of fuel does this
vehicle use ? </material>

<material> <matimage imagtype="image/gif"
uri="image1.gif" />

<altmaterial>

<mattext> Picture of Person on cycle </
mattext>

</altmaterial>
```
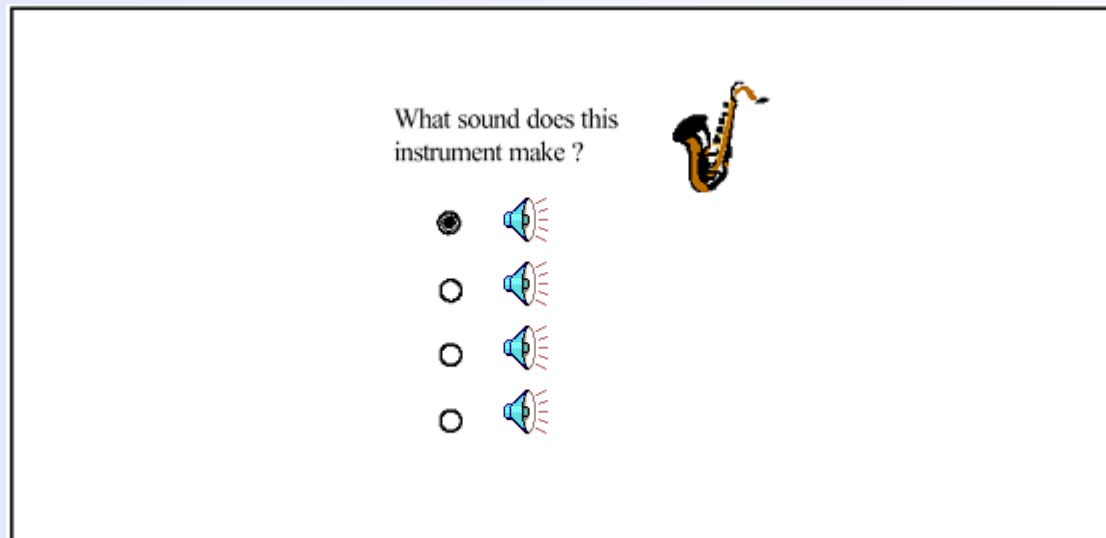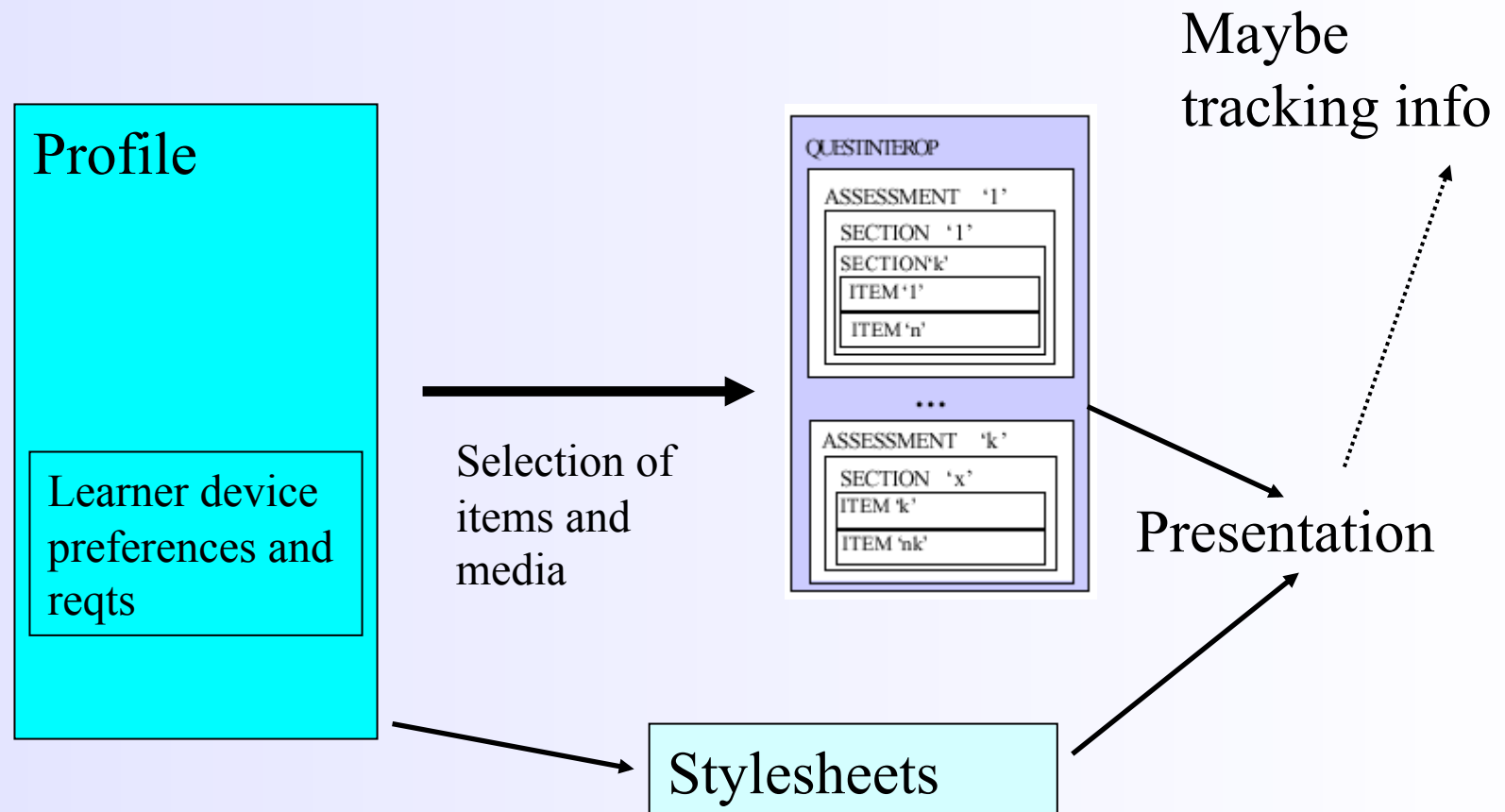
This seems a reasonable alternative

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Alternative ?

- On the other hand

Probably needs an alternative item

Some functionality

Profile

Learner device preferences and reqts

Selection of items and media

QUESTINTEROP

ASSESSMENT '1'

SECTION '1'

SECTION 'k'

ITEM '1'

ITEM 'n'

...

ASSESSMENT 'k'

SECTION 'x'

ITEM 'k'

ITEM 'nk'

Maybe tracking info

Presentation

Stylesheets

Mechanisms

- ## At item level
  - Meta-data, selection (could be in 1.2)

- ## At Media level
  - Wide range of rich media types
    - Quicktime, mpeg, avi, dvd, flash, smil, many different transcript and caption types
  - User control at runtime of what media used (maybe several concurrent streams)

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A direction – can't do this yet

```
<material>
<matvideo videotype="video/mpeg" uri="video1.gif" />
<altmaterial>
    <meta-data>
        <equivalentcontent><equivalentcontenttype>
        Text-transcript
        </equivalentcontenttype></equivalentcontent>
    </meta-data>
    ……..
</altmaterial>

<altmaterial>
    <meta-data>
        <equivalentcontent><equivalentcontenttype>
        Video-description
        </equivalentcontenttype></equivalentcontent>
    </meta-data>
    ……..
</altmaterial>
</material>
```
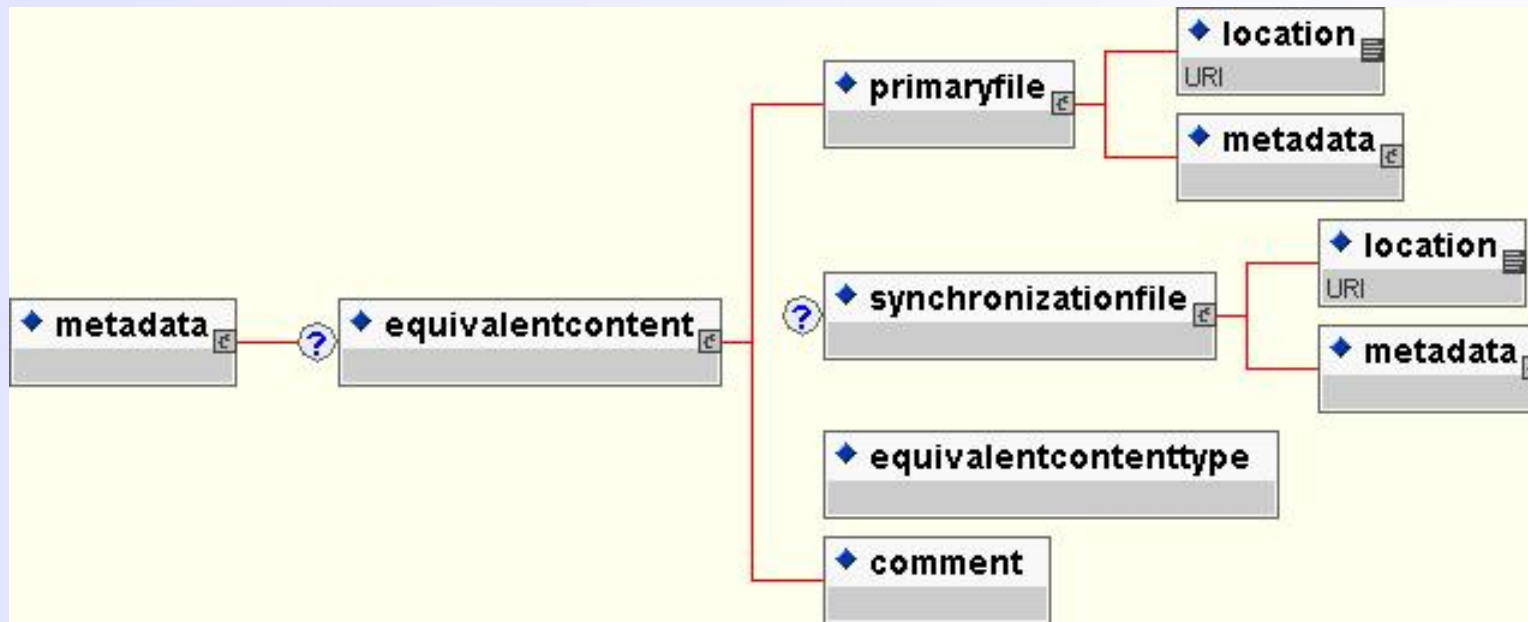
Requirements

- **Select at run-time**

- **Determine if content satisfies need**

- **Track ?**

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QTI Accessibility leading edge

- Accessibility meta-data proposal

Recently agreed .. (the leading edge)

- Multiple altmaterial elements

- Language and device issues are similar

- Material and altmaterial to get meta-data when accessibility meta-data accepted

- Validity of alternatives presumed, tracking later.

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Multiple Language Material

How many nouns are there in the french phrase

La Plume de ma tante

● 4
○ 1
○ 3
○ 2

- English

- Italian

- Japanese

Soon …

```
<?xml version="1.0" encoding="UTF-8" standalone="no">

  <SNIP/>
```

```
    <material xml:lang="en-GB">                    Thread
          <mat_text>
        How many nouns are there in the french phrase
          </mat_text>
       <altmaterial xml:lang="it">                 Thread
          <mat_text>
             Quanti nomi sono là francese nella frase
          </mat_text>
       </altmaterial>
```

```
  <MORE-altmaterials-follow/>
```

… Soon …

```
    <altmaterial xml:lang="ja-JP">
        <mat_text>
```
何名詞がフランス句にそこにあるか
```
        </mat_text>
    </altmaterial>
</material>
```

Thread

```
<material xml:lang="fr">
    <matemtext>
        la plume de ma tante
    </matemtext>
</material>
```

Common

For consideration

- Equivalence of media-level and item-level alternatives

    – Tracking information in the ASI and Results specs ? What, how ?

Finally ..

- The earlier that accessibility requirements are incorporated the less there is to do

- We are legally required to do it

- The world needs all its human resources

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Finally ..

- より早い入手の可能性の条件は組み込まれたより少しがすること
ある

- それをするように法的に要求される

- 世界は人的資源すべてを必要とする