



Open Hypermedia as User Controlled Meta Data for the Web

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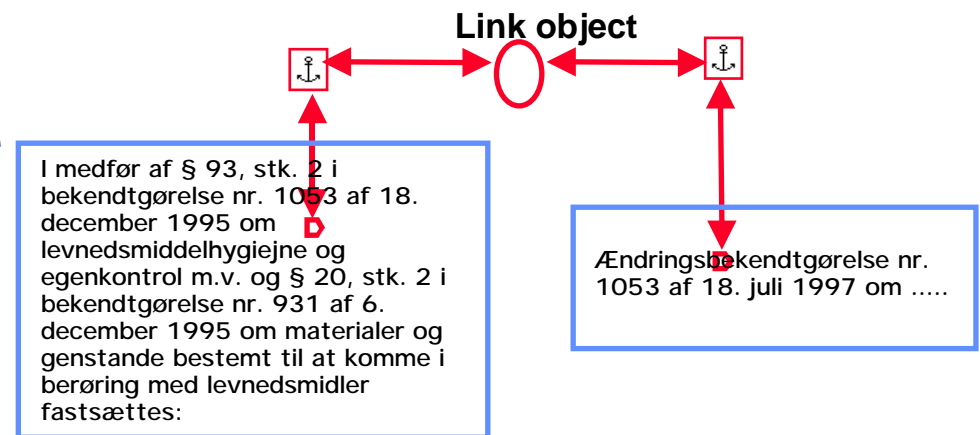
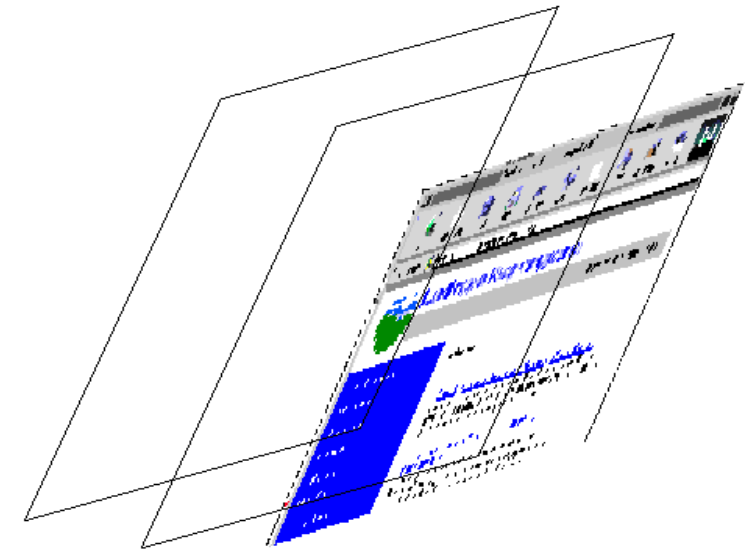


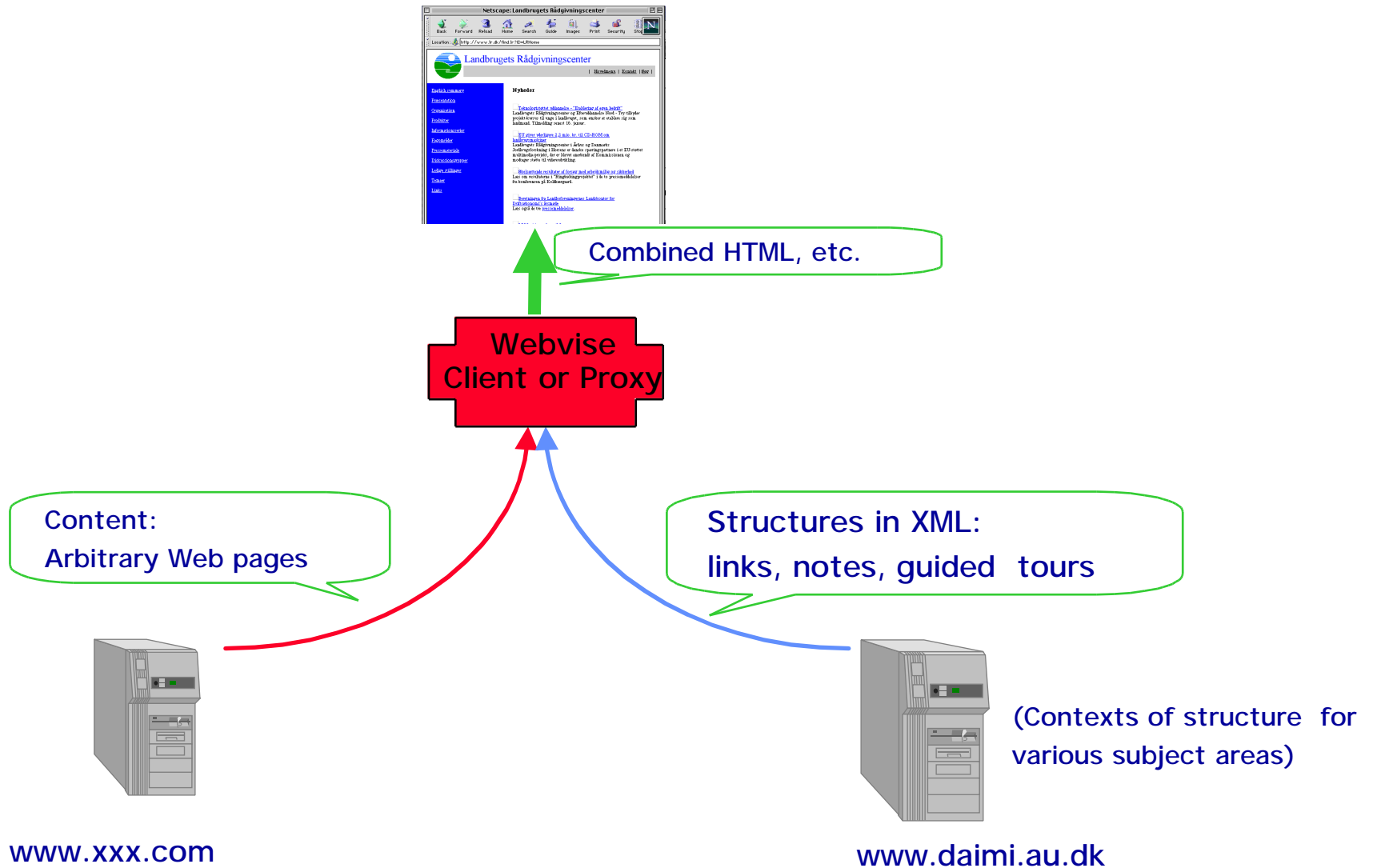
Plan



- **What is open hypermedia?**
- **Meta-data, Xlink/Xpointer, and Open Hypermedia**
- **OHIF - Open Hypermedia Interchange Format**
 - Extensible datamodel - beyond link structures
 - Locating method
 - Webwise support
- **Collaboration support for open hypermedia meta-data**
- **Status and conclusion**

- Users may create their own meta-data and structures (links, collections, anno-tations etc.) on the Web
- Structures (contexts) are stored in separate XML files
- Many layers of structure on top of the same Web documents
- Users may apply one or more layers at a time







Meta-data & Xlink/xpointer



- **RDF: XML format designed to describe primarily individual resources on the Web**
- **Xlink: XML format to store navigational hypermedia structures**
 - locators are URIs including URL and URIs with Xpointer fragment identifiers
- **Xpointer: Fragment identifier language for addressing parts of XML documents**



Examples of meta-data services



- **Digital libraries**
 - author supply keywords, librarians supply categories
- **Alexa**
 - Website relationships are inferred from browsing behavior of subscribing users
- **Flyswat**
 - company members can supply explanations or commercials to words mentioned on arbitrary websites
- **Currently meta-data is generated in mainly two ways:**
 - supplied by author or librarian
 - automatically generated from user behavior on the Web



Open hypermedia approach to meta-data



- **User annotations to documents may become useful meta-data for other users (Marshall, 1998)**
- **Relationships between documents may be useful meta-data for users**
- **Users - not owning the documents - should be able to create, control and share their own meta-data**
 - e.g. for resources in a digital library
- **Maintaining structures, annotations and attributes separate from content is crucial to this approach**
- **The ability to organize and annotate arbitrary MIME types is equally important**
 - e.g. popular word processors, spreadsheets, CAD



Representing open hypermedia meta-data

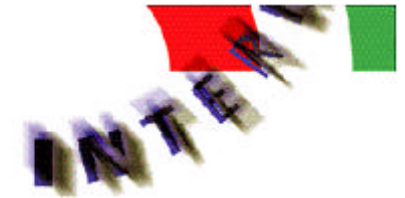


Xlink and Xpointer are promising standards, BUT...

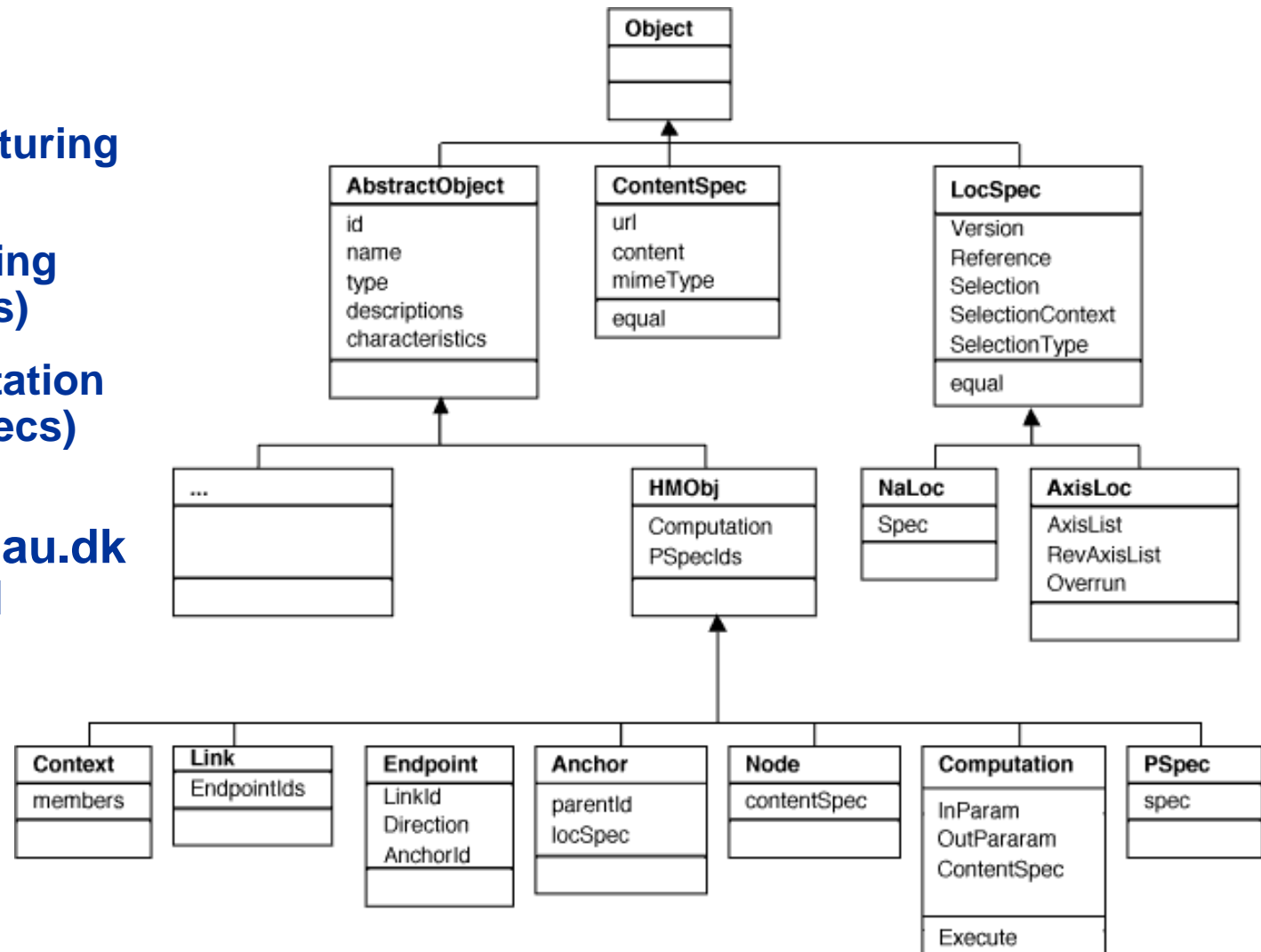
- **Xlink only handles generalized link structures**
 - composite, spatial or taxonomic structures not supported
- **Xlink locating is restricted to URIs with Xpointer fragment identifiers**
 - this rules out locating in data types like spread sheets, CAD, Audio, Video
- **The Open Hypermedia community (OHSWG) has developed**
 - general structuring mechanisms
 - general locating mechanism (LocSpecs - Grønbæk & Trigg, 1996)
- **We propose the extensible Open Hypermedia Interchange Format (OHIF) to represent structures and annotations**



OHIF- Datamodel for open hypermedia structures



- Extensible model
- Open for new structuring mechanisms
- Open for new locating methods (LocSpecs)
- Open new presentation specifications (PSpecs)
- Implied DTD:
<http://www.daimi.au.dk/~les/ohif/ohif.dtd>





LocSpecs: Locating segments of data



- A locSpec is used to specify a certain location within a node's content
- LocSpecs use several attributes to hold location information:
 - Reference, Selection, Selection context, Axis specification.
 - In most cases one of these attributes is sufficient
- Example: Text document
 - Reference: a bookmark ID or a HTML target name
 - Selection: the text of the span to search for
 - Selection context: some surrounding text
 - Axis: a position, such as start position, and stop position
- Detecting and repairing inconsistencies



OHIF DTD with inheritance



```
<!ENTITY % hmObjAttrs
```

```
"id      ID          #REQUIRED
```

```
type    (%hmObject;) #REQUIRED
```

```
name    CDATA        #IMPLIED
```

```
">
```

```
<!ENTITY % abObjInfo "PROPERTIES?">
```

```
<!ENTITY % hmObjInfo "(%abObjInfo;), COMPUTATIONID?,  
PSPECIDSET?">
```

```
<!ENTITY % locSpecInfo "SELECTION?, SELECTIONCONTEXT?,  
SELECTIONTYPE?">
```

```
<!ENTITY % compositeInfo "COMPREFIDSET">
```

```
<!ENTITY % compRefInfo "(%locSpec;)">
```



Examples from OHIF DTD



```
<!ELEMENT LINK
  ((%hmObjInfo;),
  ENDPOINTIDSET?)>
<!ATTLIST LINK
%hmObjAttrs;
semtypeid %IDATTR;  #IMPLIED
>
```

```
<!ELEMENT COMPOSITE ((%hmObjInfo;),
  (%compositelInfo;))>
<!ATTLIST COMPOSITE
%hmObjAttrs;
>
```

```
<!ELEMENT GUIDEDTOUR
  ((%hmObjInfo;), (%compositelInfo;),
  EDGEIDSET?)>
<!ATTLIST GUIDEDTOUR
%hmObjAttrs;
startVertexId %IDATTR;  #IMPLIED
>
```



Example of the Node element



```
<NODE id="ariel.xserver.2" type="NODE" name="DOM">
  <DESCRIPTIONSET>
    <DESCRIPTION name="default">
      <VALUE>DOM Specifications</VALUE>
    </DESCRIPTION>
  </DESCRIPTIONSET>
  <CHARACTERISTICSSET></CHARACTERISTICSSET>
  <COMPUTATIONID></COMPUTATIONID>
  <CONTENTSPEC>
    <URL>http://www.w3.org/TR/REC-DOM-level-1/</URL>
    <CONTENTS></CONTENTS>
    <MIMETYPE>Text/HTML</MIMETYPE>
  </CONTENTSPEC>
</NODE>
```



Link Element



```
<LINK id=ariel.xserver.6 type="LINK" name="DOM relationships">
  <DESCRIPTIONSET>
    <DESCRIPTION name="default">
      <VALUE>DOM specifications</VALUE>
    </DESCRIPTIONSET>
  <CHARACTERISTICSSET></CHARACTERISTICSSET>
  <COMPUTATIONID></COMPUTATIONID>
  <ENDPOINTIDSET>
    <ID>xsite.xserver.10</ID>
    <ID>xsite.xserver.14</ID>
    <ID>xsite.xserver.20</ID>
  </ENDPOINTIDSET>
</LINK>
```



Anchor element



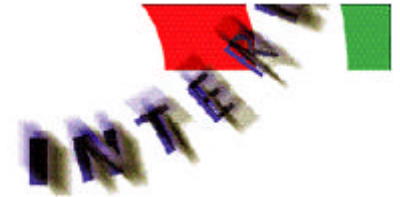
```
<ANCHOR id="xsite.xserver.6" type="ANCHOR" name="Information" >
  <CHARACTERISTICSSET>
    <CHARAC name="userNote">
      <VALUESET>
        <VALUE>This mobile phone is the ...</VALUE>
      </VALUESET>
    </CHARAC>
  </CHARACTERISTICSSET>
  <PSPECIDSET>
    <ID>xsite.xserver.5</ID>
  </PSPECIDSET>
  <SIMPLELOC>
    <SELECTION>Information</SELECTION>
    <SELECTIONCONTEXT>Information about the Coconut Project
  </SELECTIONCONTEXT>
  </SIMPLELOC>
</ANCHOR>
```



```
<PSPEC id="xsite.xserver.5" type="PSPEC">
  <CHARACTERISTICSSET>
    <CHARAC name="userNoteKind">
      <VALUESET>
        <VALUE>Popup</VALUE>
      </VALUESET>
    </CHARAC>
  </CHARACTERISTICSSET>
</PSPEC>
```




En composite: Guided tour



```
<GUIDEDTOUR id="xsite.xserver"  
  type="GUIDEDTOUR"  
  name="Mobile computing">  
<COMPREFIDSET>  
  <ID>xsite.xserver.8</ID>  
  <ID>xsite.xserver.12</ID>  
  <ID>xsite.xserver.6</ID>  
  <ID>xsite.xserver.10</ID>  
  <ID>xsite.xserver.4</ID>  
</COMPREFIDSET>  
<EDGEIDSET>  
  <ID>xsite.xserver.14</ID>  
  <ID>xsite.xserver.13</ID>  
</EDGEIDSET>  
</GUIDEDTOUR>
```

```
<EDGE id="xsite.xserver.14"  
  type="EDGE"  
  originid="xsite.xserver.10"  
  destinationid="xsite.xserver.12">  
</EDGE>
```



Webwise support for OHIF



- **Webwise is an open hypermedia "helper" application which is tightly integrated with MS Internet Explorer**
- **Loads OHIF files in the following ways:**
 - File open
 - Content handler for text/ohif MIME type
 - When following **oh~~tt~~p://www.xxx.com/.../test.ohif** type of links
- **Saves OHIF files in the following ways:**
 - Local file save
 - Upload to WebDAV enabled Webserver
- **The full OHIF DTD is supported**



Managing shared meta-data



- **Using WebDAV enabled servers, we can share and distribute open hypermedia meta-data globally**
 - Web documents as well as office documents
- **Webvise integrates MS Office applications**
 - i.e. it supports locating in Word documents and Spreadsheets
 - MS Office 2000 supports WebDAV
- **Webvise supports creation, manipulation, and sharing of OHIF files via WebDAV servers**



Sharing OHIF via WebDAV



Name	Type	Location
Palm Co...	WWW...	http://palmorder.mediamedia.com
Palm V R...	WWW...	http://www.comingsoft.com/palmst
Drooney	WWW...	http://www.the-gadgets.com/do
GSM for ...	WWW...	http://www.eggbot.com/gsm.html
3Com P...	WWW...	http://www.palm.com/products/pa
3Com/P...	WWW...	http://www.palm.com/customp/ta
Palm, Inc.	WWW...	http://www.palm.com/products/pa
pdacom...	Word	http://www.sharestation.com/*1.g

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Files	Sharing	Preferences	Empty
pdv.ohif	44K	December 2, 1999 9:01:09 PM GMT	
pdv2.ohif	49K	December 2, 1999 11:11:00 PM GMT	
pdacom.doc	15K	February 29, 2000 11:04:15 AM GMT	
test.ohif	13K	November 29, 1999 12:35:58 PM GMT	

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Faribault Woolen Mills Sto
— <http://www.faribault.com> —

My notes on [Palm](#) devices.

[Snap On](#) modems are not necessary anymore, if you have an IR port on your cell phone.



Conclusion and Status



- **Several implementations available**
 - Webwise and Arakne (University of Aarhus, Denmark + Danish Telecom)
 - Chimera (University of Colorado, Boulder)
- **The format is in use by other services**
 - Ariadne guided tour system (presented at WWW7)
 - Arakne - Mimicry system for linking in time-based media (presented at WWW8)
- **Potential contributions to Web based protocol and format standards for open hypermedia**

Webwise prototype accessible from <http://www.mjolner.dk>