file format features and significant properties

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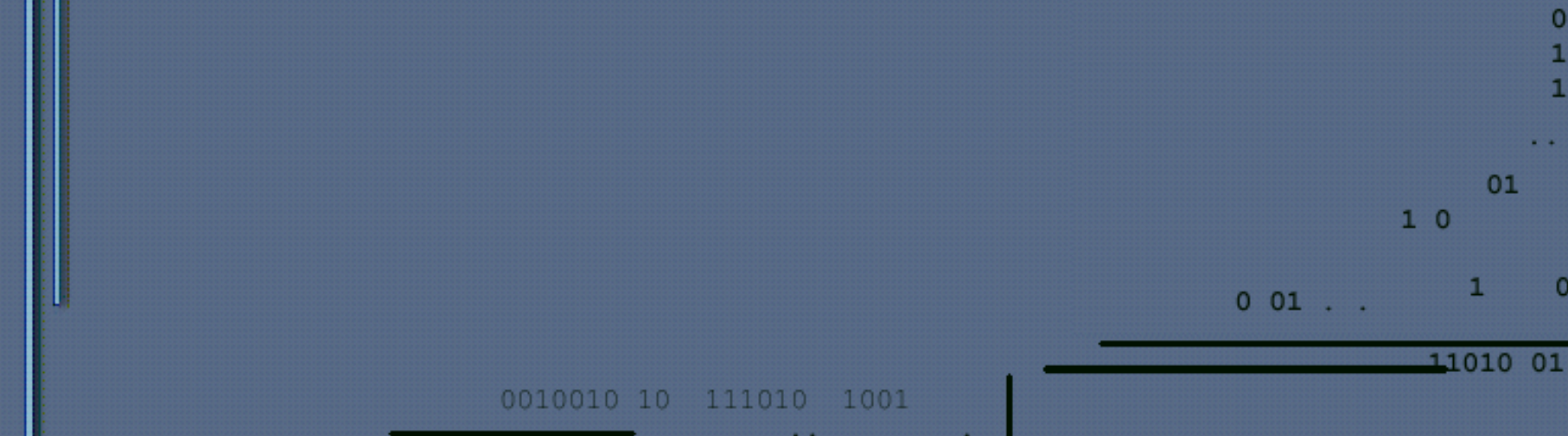
overview

1. file format features
2. significant properties
3. file formats in digital preservation

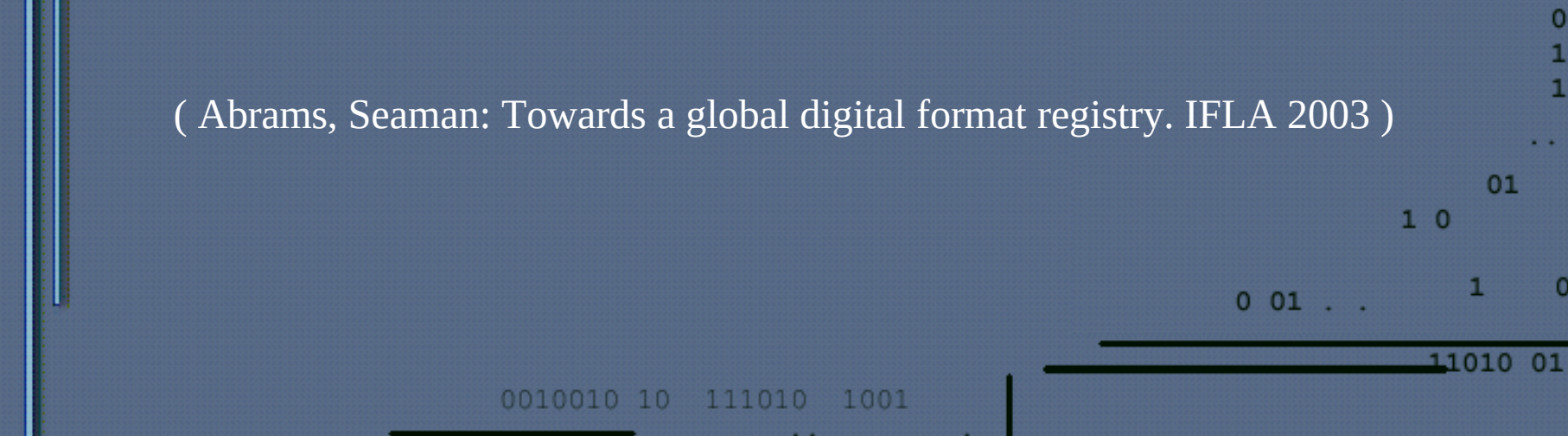


What is a file format?

A format is a fixed, byte-serialized encoding of an information model.

An information model is a formal expression of exchangeable knowledge.

(Abrams, Seaman: Towards a global digital format registry. IFLA 2003)



format examples

```
<FONT SIZE=3 STYLE="font-size: 13pt">Chinese-European Workshop
on Digital Preservation</FONT></H1><H1 LANG="en-GB"
CLASS="western" ALIGN=CENTER STYLE="margin-left: -0.64cm"><FONT
SIZE=3 STYLE="font-size: 13pt">Beijing, July 14&ndash;16,
2004</FONT><P LANG="en-GB" CLASS="western" ALIGN=CENTER
STYLE="margin-left: -0.64cm; margin-bottom: 0cm">Preliminary
Agenda, Version 1.0</P><FONT SIZE=2 STYLE="font-size:
11pt"><B>Day 1 (14 July 2004)<P LANG="en-GB" CLASS="western"
ALIGN=LEFT STYLE="margin-bottom:"><B>Introduction</B></P><P
LANG="de-AT" CLASS="western" ALIGN=LEFT><SPAN LANG="en-
GB">Moderator:<I>Xiaolin Zhang</I>,
<I>CSDL/CAS</I></SPAN></P>SPAN LANG="en-GB">Welcome and
Introduction</SPAN></P><P LANG="de-AT" CLASS="western"
ALIGN=LEFT><I><SPAN LANG="en-GB">Longji Dai,
CALIS.</SPAN></I></P></TD></TR><TR VALIGN=TOP><TD WIDTH=47
ALIGN=LEFT><SPAN LANG="en-GB">9:15-9:30</SPAN></P></TD><TD
WIDTH=576 BGCOLOR="#f3f3f3"><P LANG="en-GB" CLASS="western"
ALIGN=LEFT STYLE="margin-bottom: 0cm">Opening Remarks</P>
```

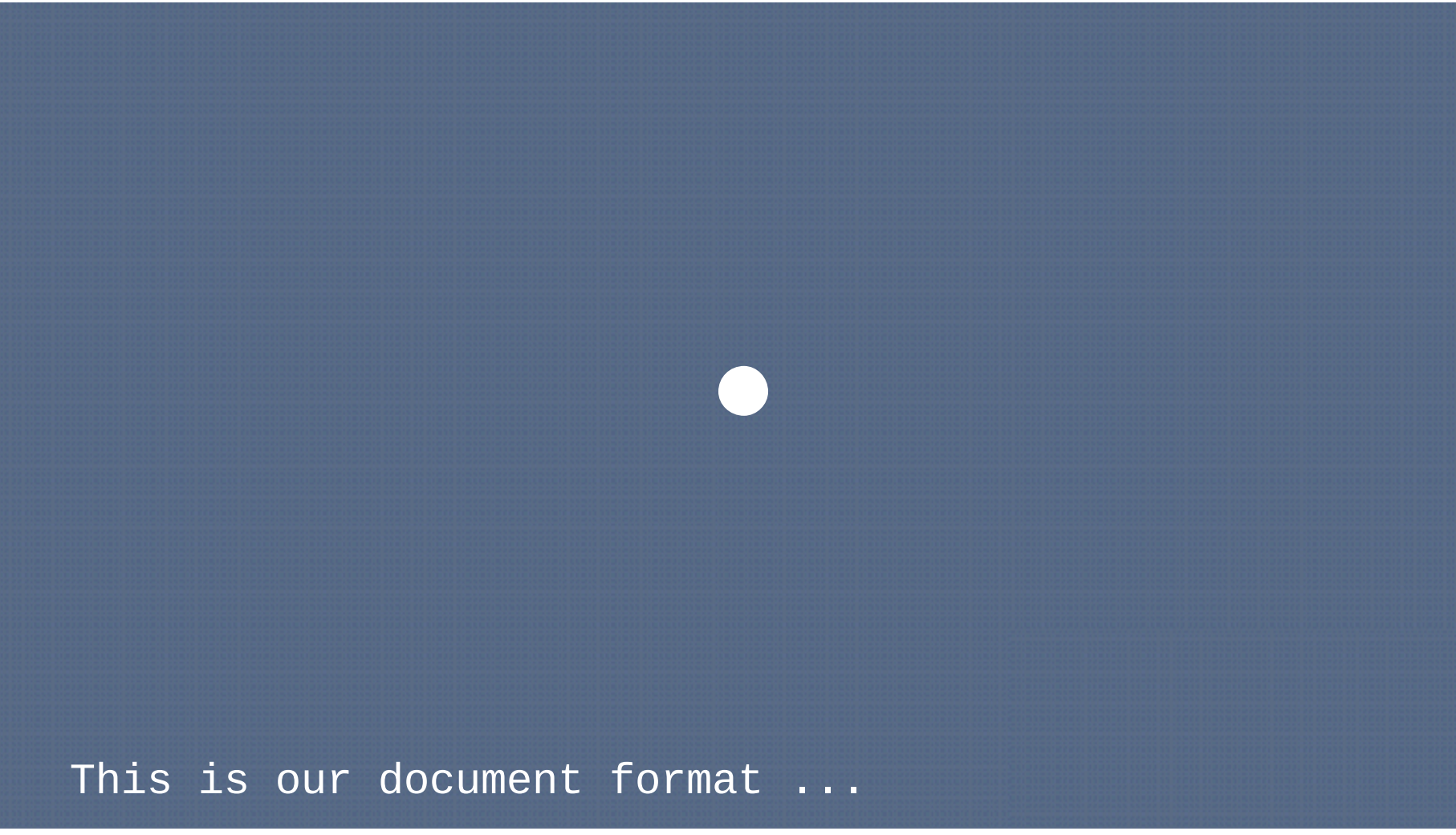
duction□Longji Dai, CALIS.□□9:15-9:30□Opening Remarks□Haibo Y

categorisation

Document - DOC, HTML
Page description language - PDF, Postscript
Raster Images - TIFF, PNG, JPEG
Structured graphics - CAD, VSD, QXD
Audio - WAV, MP3, MIDI
Video - MPEG, AVI
Spreadsheets - XSL
Databases - DBF, MDB
Configurations, metadata - CSS
Raw data
Collections - tar, zip
Program-supporting - TTF, game saves
Object code - EXE, COM

(wikipedia.org; Clausen, May 2004)

format features



This is our document format ...

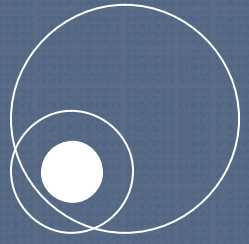
format features

```
<doc>
  This is our document format ...
</doc>
```

format features

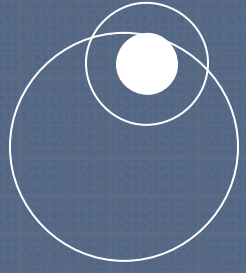
```
<doc>
  This is our <b>document</b> format ...
</doc>
```

format features



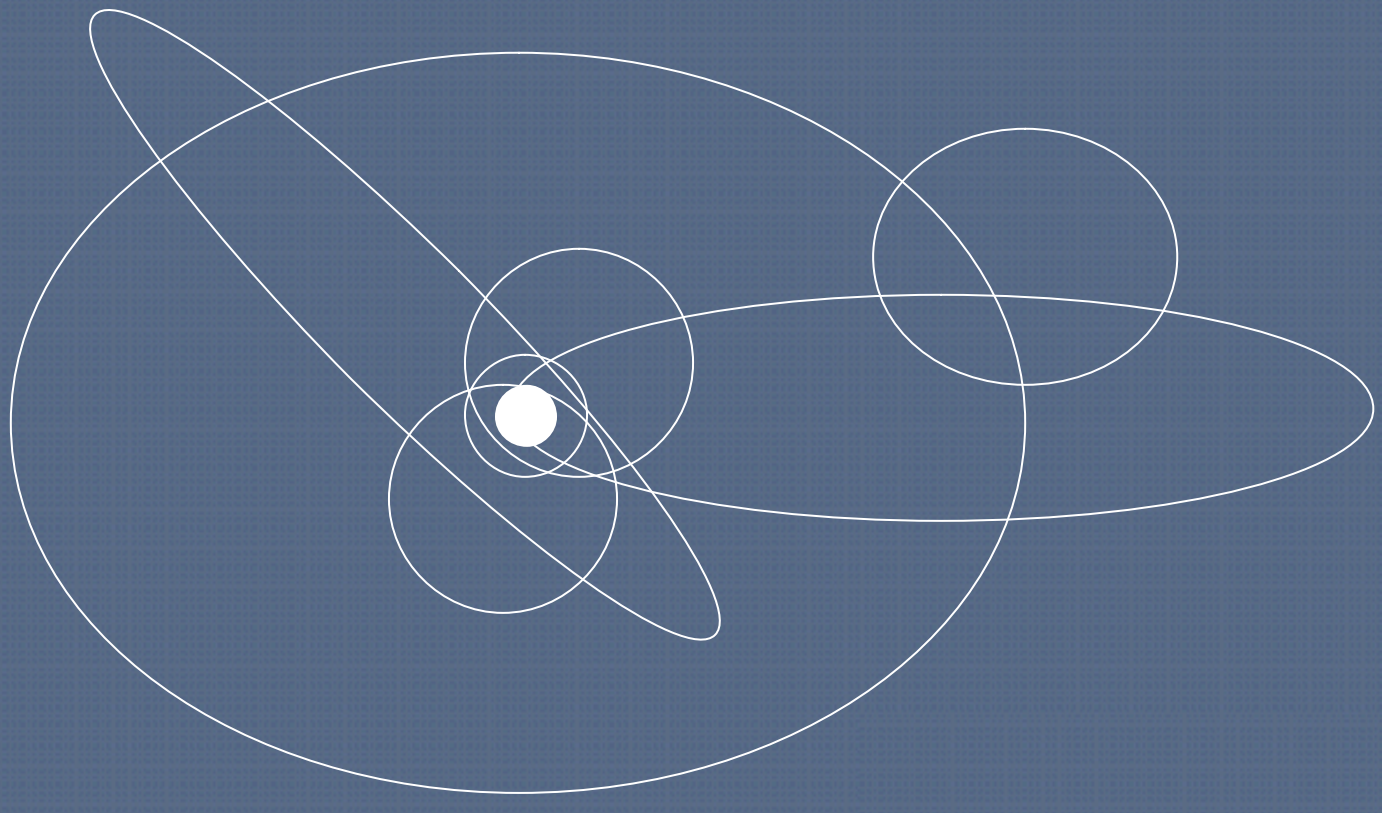
```
<doc>
   This is our <b>document</b> format ...
   <table><raw> with tables </raw></table>
</doc>
```

format features



```
<doc>
  This is our <b>document</b> format ...
  or <img>images <source>image/filename</source></img>
</doc>
```

format features



-> document formats <-

format features

digital signature

password

formulas

...

...

...

tables

headlines

basic formatting

colours

styles

text

drawing

animations

inline images

...

sound

commenting

revision history

multi-language
personalisation

active referencing

automatic index

...

...

-> document formats <-

format features

digital watermark

password

...

...

...

flow chart

layers

transparency

rotation

clipart

text

colour spaces

...

sound

revision history

animations

interactive graph

dynamic inlays

...

...

-> image formats <-

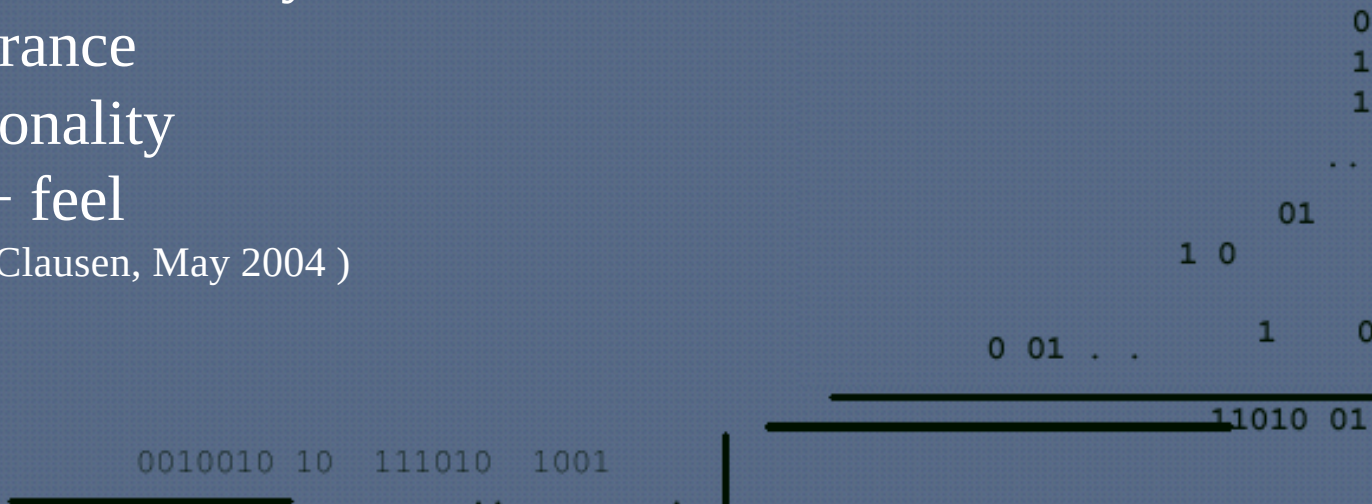
feature classification

- appearance
- structure
- behaviour

(? A.Rauber presentation)

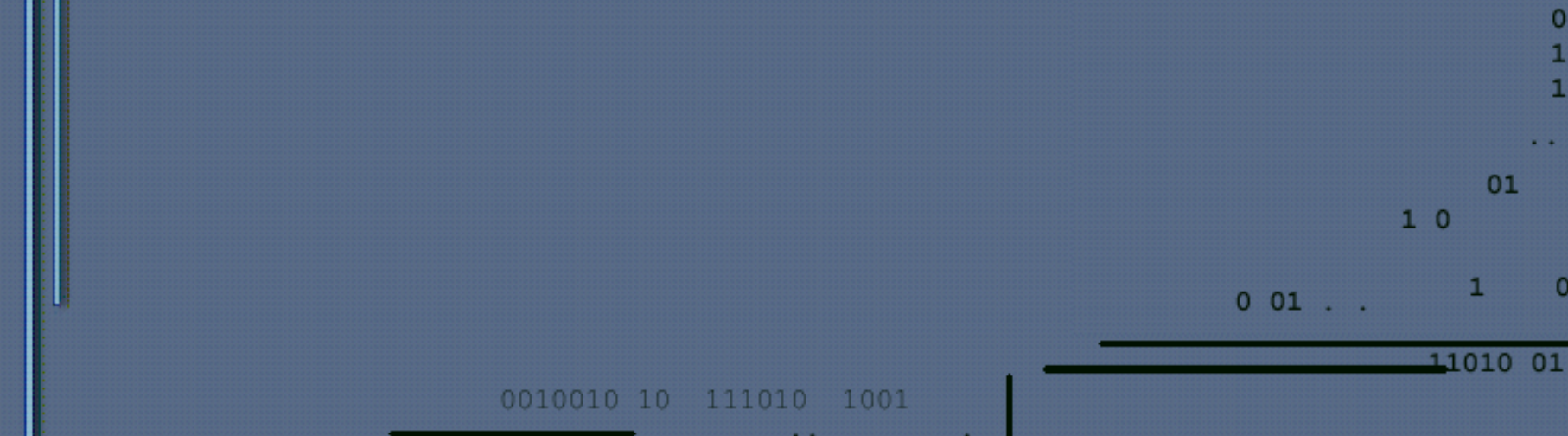
- readability
- comprehensibility
- appearance
- functionality
- look + feel

(Clausen, May 2004)



lesson learnt

the **simpler** the object (**fewer** features),
the **more manageable** the preservation challenge



format

functional
technological

significant properties

essence of an object

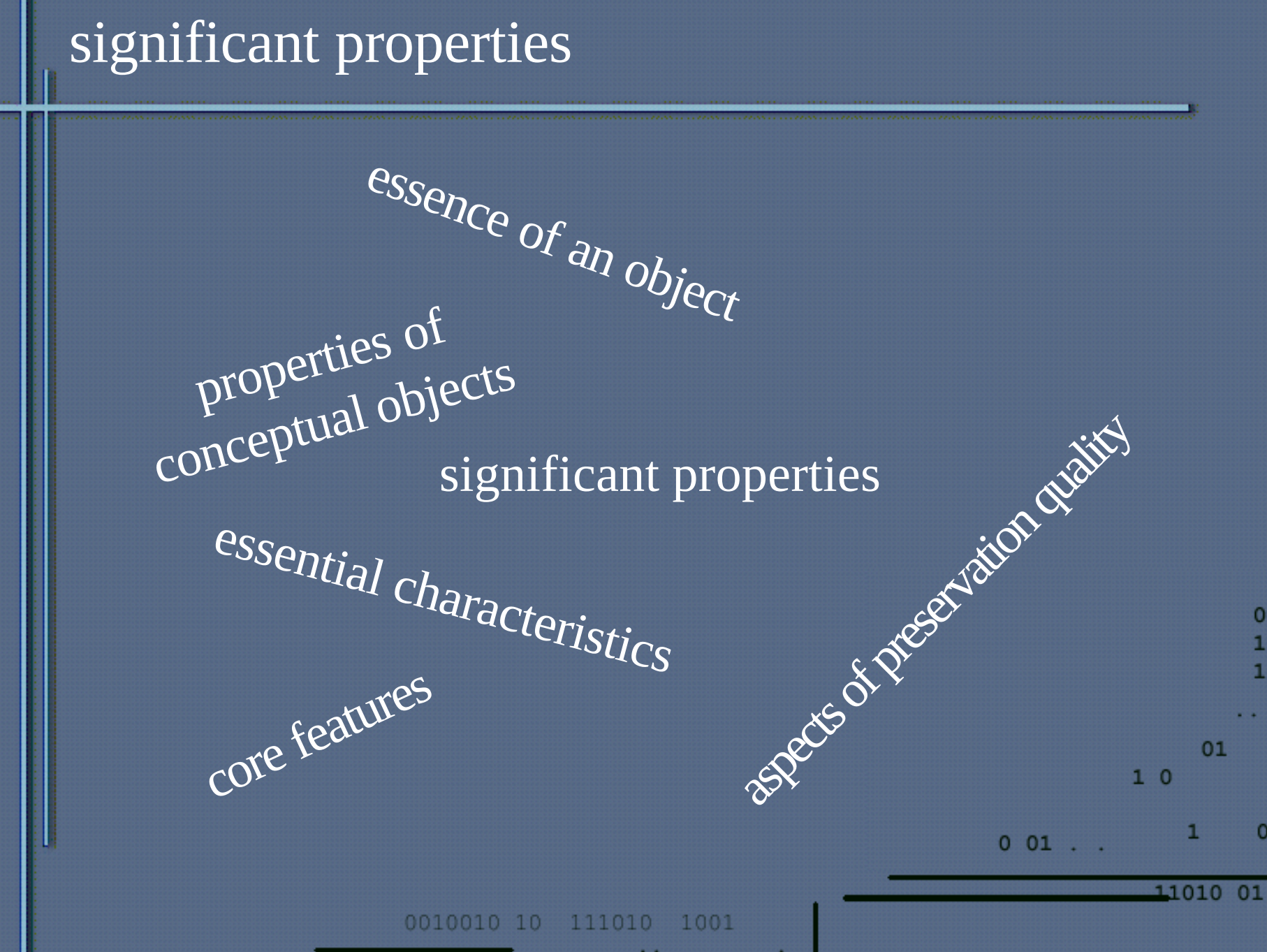
properties of conceptual objects

significant properties

essential characteristics

core features

aspects of preservation quality



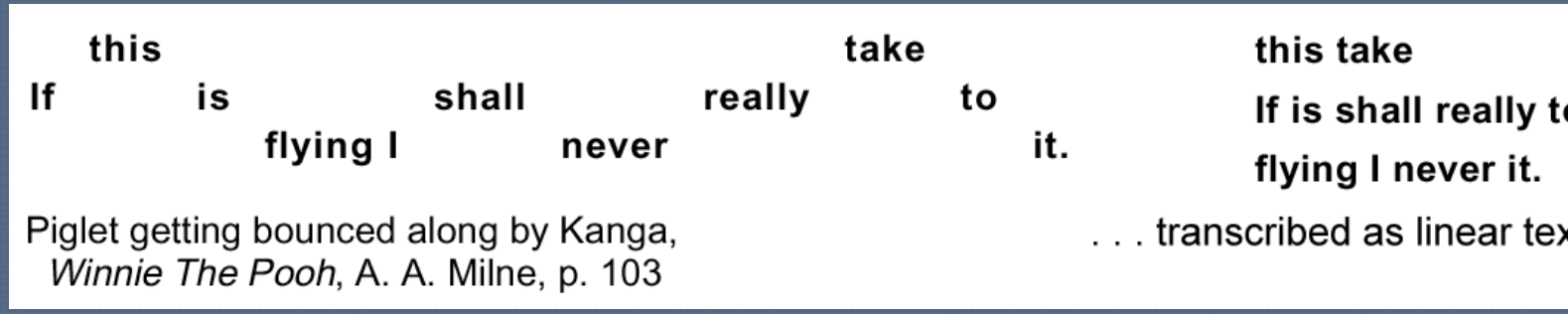
significant properties - the intention

important

- to fulfil a business function
- to adequately purport meaning

depends on a specific task
in a specific business environment

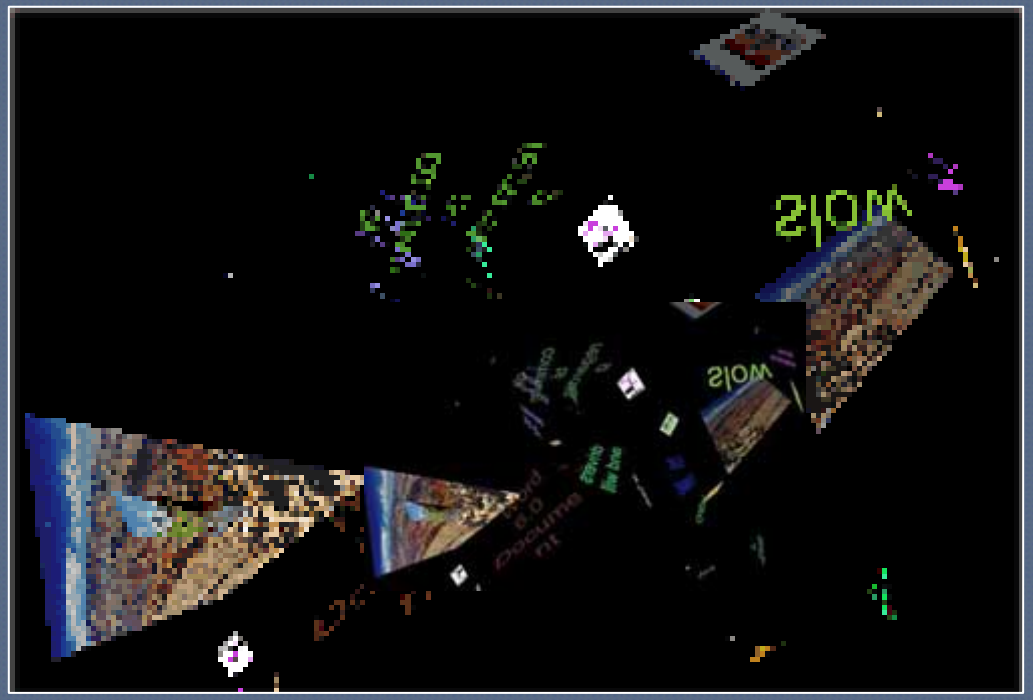
significant properties - the medium



- text
- formatting
- page format, pagination
- headlines, footnotes
- metadata

Jeff Rothenberg (May 2001):
Emulation vs. Migration for
Preserving Software-Dependent
Artefacts.

significant properties - a comparison



Mary Flanagan: **[phage]**
www.maryflanagan.com/virus.htm
www.variablemedia.net/e/seeingdouble/home.html

significant properties

fundamental purpose, intellectual content

preserve the idea? or preserve the performance?

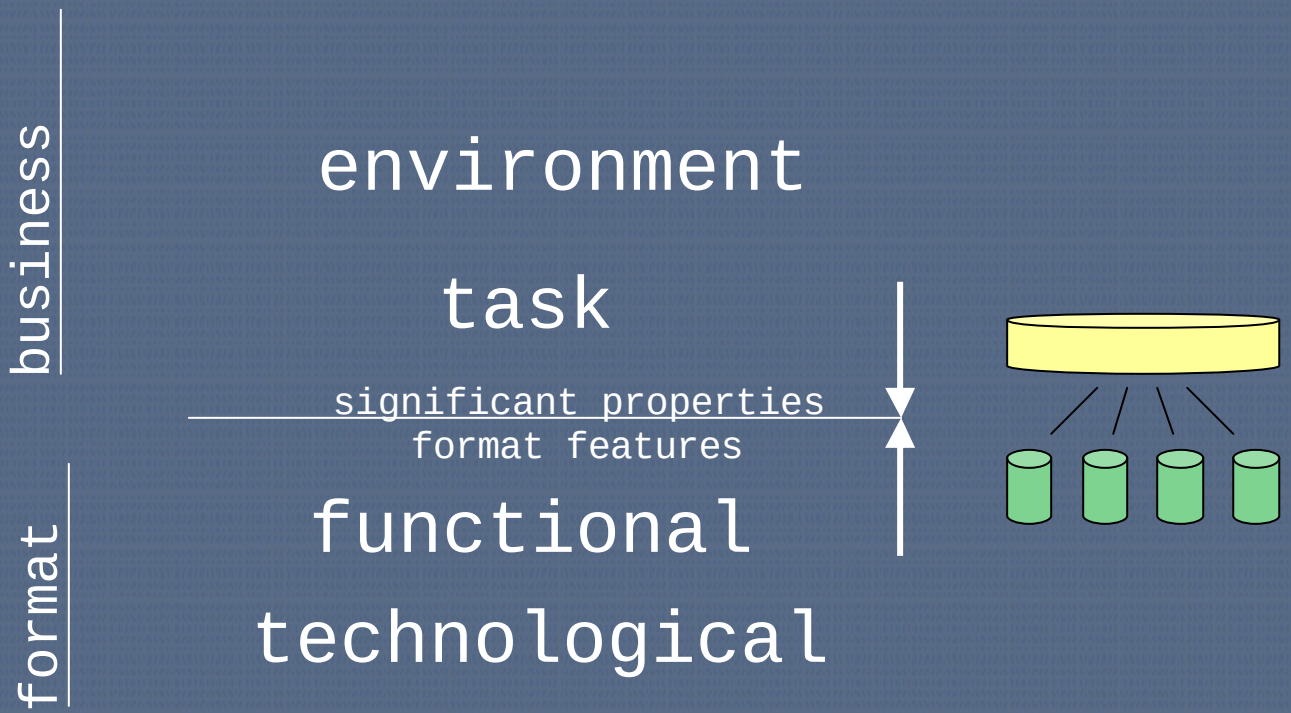
- ? intention of the author
- ? mission of preserver
- ? requirements of future users

lesson learnt

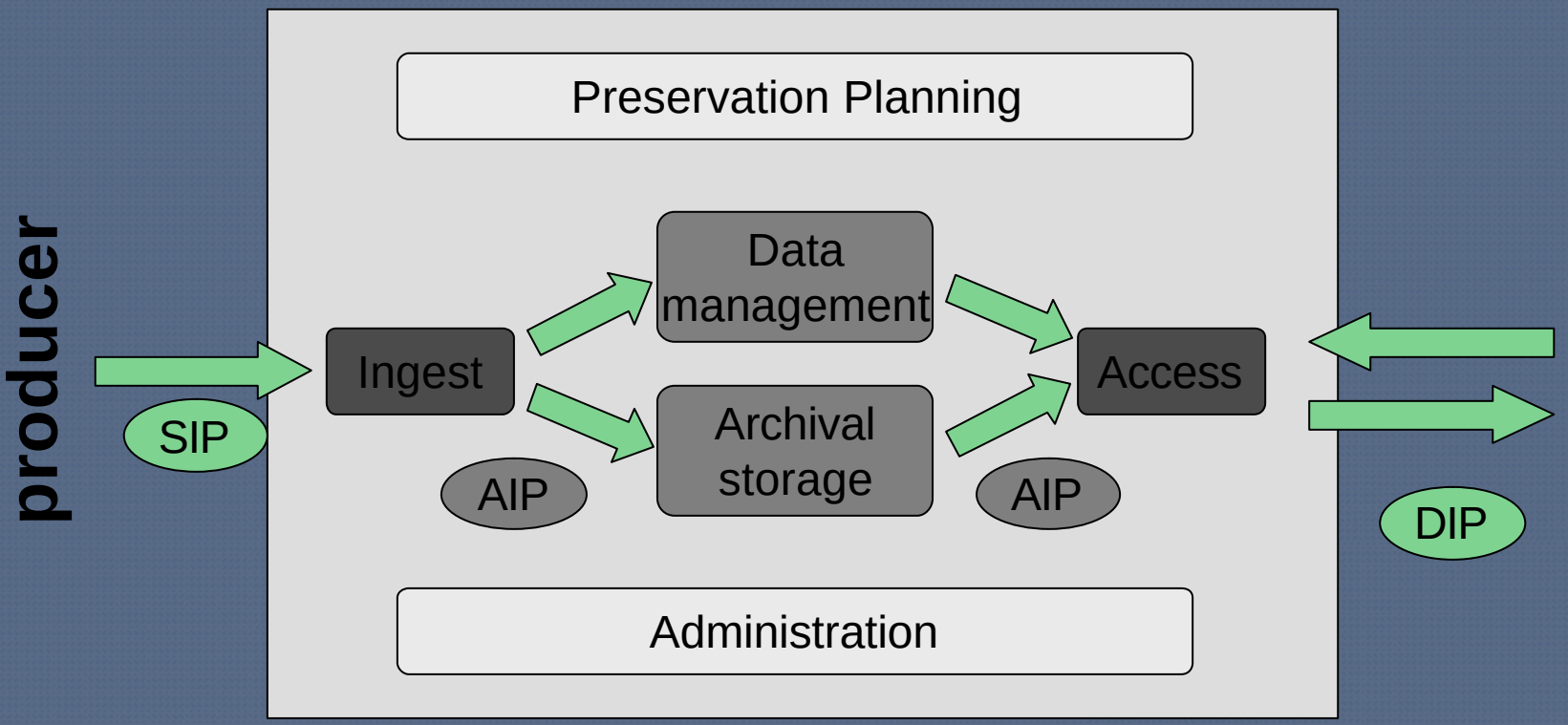
the **simpler** the object (**fewer** features),
the **more handable** the preservation challenge

preserve as **simple** objects as possible,

but as **rich** as necessary to adequately carry their purpose into the future


business
format
environment
task
significant properties
format features
functional
technological

OAIS model



SIP Submission Information Package

AIP Archival Information Package

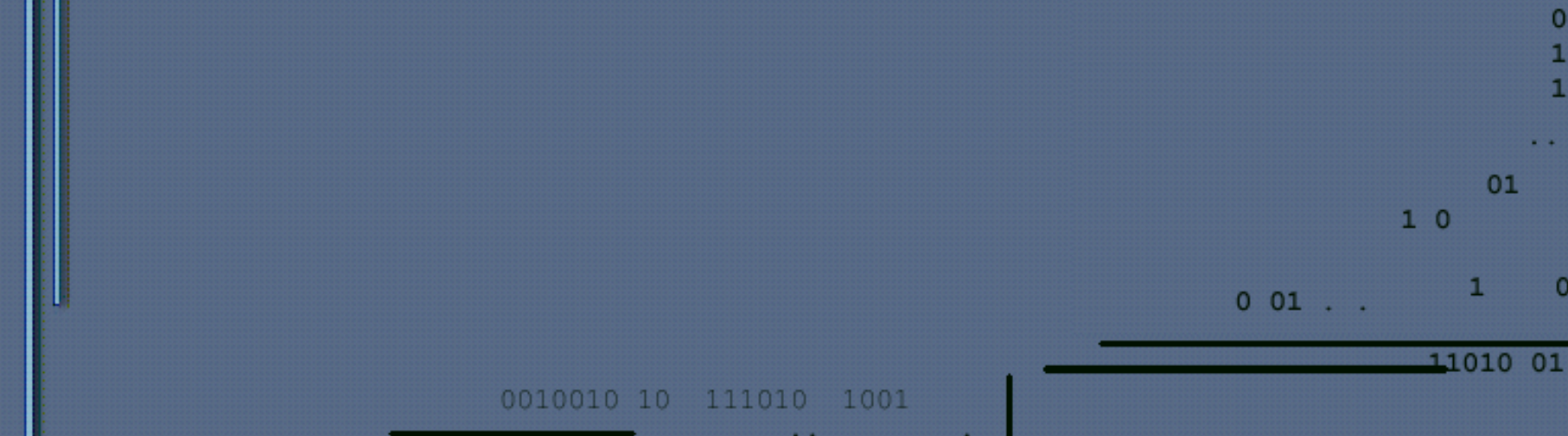
DIP Dissemination Information Package

file formats in digital preservation

possible indicators for long-term stability

- stable, robust
- portable
- open

? widely used and well documented

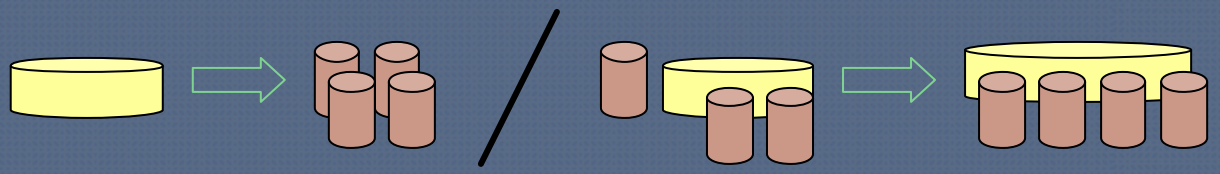


conversion

moving between formats

* SIP ? AIP
* AIP ? DIP

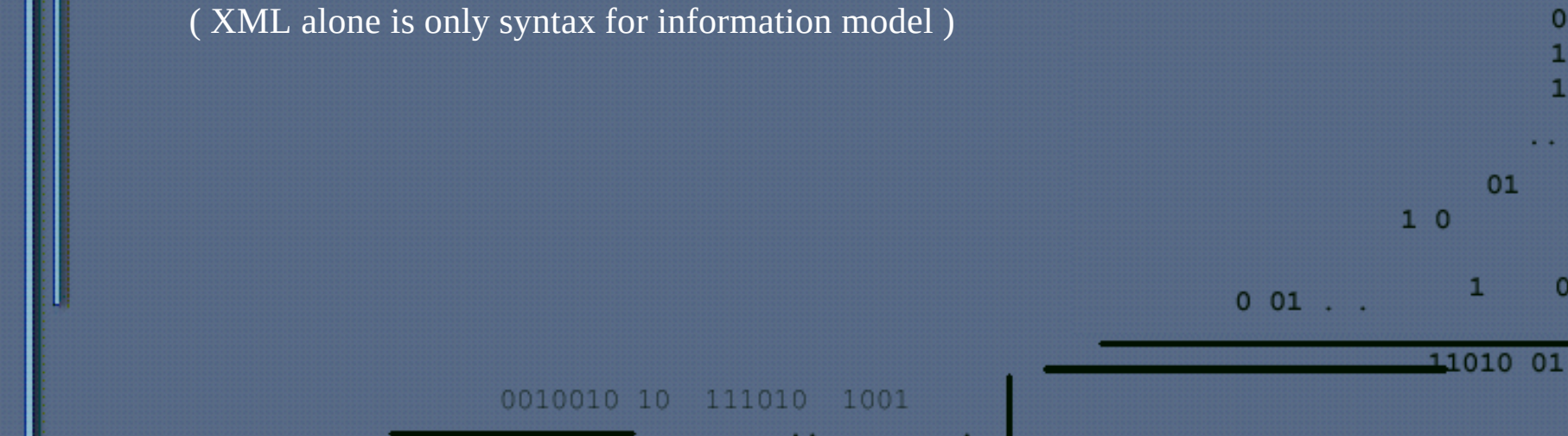
conversion **problems**:
format features; significant properties; process



more format issues in preservation

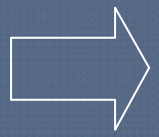
* multiple objects, external libraries
* nested files
* XML inside? /.
* encryption, compression
* metadata

(XML alone is only syntax for information model)

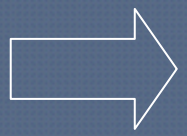


XML inside?

```
<?xml version="1.0" encoding="UTF-8"?>
<workshop>
   <location>beijing</location>
   <date>july 2004</date>
   <topic>digital preservation</topic>
</workshop>
```



XML database



```
 ^A ^E@href^V^Etitle
     ^Fgroups^B^F@title^Y^Dauth^A^Duse^Csup^]^Glast-
     id^L^Cuid^O
^C@id^F^Dname^category^Z^Eusers^G^Ab^document^T^Dlink^
     \^ApESlocation^Q^Ginclude
^U^Etopic^workshop^P^Dhref^_    @password
@last-id^C^Ddate^R^D@uid
     ^Dbody^W^E@name^E^Egroup^D^Bid^K^Gsection^passwo
rd^N^A^_http://www.w3.org/2001/XInclude^A^A^Bxi^A
```

conclusions

! think about what you are doing

! watch what's going on

! check closely

! document it

! ensure you have all the information you need

further reading

* ERPANET Training Seminar:
  File Formats for Preservation.
  May 2004; Vienna, Austrian National Library.
  www.erpanet.org
* Lars R. Clausen: Handling File Formats. The Royal Library, Copenhagen, and The State and University Library Aarhus, Denmark. May 2004.
  http://www.netarkivet.dk/website/publications/FileFormats-2004.pdf
* Adrian Brown: Selecting File Formats for Long-Term Preservation. UK National Archives Digital Preservation Guidance Note 1. June 2003.
  www.pro.gov.uk/about/preservation/digital/guidance/selecting-file-formats.pdf
* John Bennett: A framework of Data Types and Formats, and Issues affecting the long term Preservation of Digital Material. 1997.
  http://www.ukoln.ac.uk/services/elib/papers/supporting/pdf/rept011.pdf
* Lawrence et al.: Risk Management of Digital Information: A File Format Investigation. June 2000. CLIR Report, ISBN 1-887334-78-5.
  http://www.clir.org/pubs/reports/pub93/pub93.pdf