

SPeLOs:

# Significant Properties of E-learning Objects

A report for the JISC Digital Preservation and  
Records Management Programme

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# SPeLOs

- \* Aims and objectives
- \* Digital objects in the E-learning domain
- \* Developing a typology for Learning Objects
- \* An example Learning Object
- \* Observations and conclusions

# Aims

- \* Complement InSPECT
- \* Expand the digital object type portfolio
- \* Understand the complexity and characteristics of Learning Objects
- \* Basis for more detailed work



# Objectives

- \*  $SPs \times LOs = ?$

- \* Assess InSPECT  
definition of SPs

- \*  $SPs + DC = ?$

- \* LO classification

- \* SPs:

- \* Expression

- \* Metrics

- \* Objective / Subjective

- \* Definition

- \* Future research?

# What is a Learning Object?



Photo by John McCullough on Flickr  
<http://www.flickr.com/photos/grytr/285072637>

# What is a Learning Object?

- \* "Any object can actually be exactly the right object to explain some concept or idea. Still they are not "learning objects". They are only "potential learning objects". They become learning objects only when they are brought in to learning context by an authority (teacher, publisher...)"

Free Libre and Open Source Software in Education  
(FLOSSE) Blog

# What is a Learning Object?

- \* “a relatively small, reusable digital entity that can be selectively applied – alone or in combination – by computer software, learning facilitators or learners themselves, to meet individual needs for learning or performance support.” Clive Shepard (2000)
- \* “any digital resource that can be reused to support learning,” David Wiley (2001)

# What is a Learning Object?

- \* File format

- \* The usual suspects (PPT, PDF, SWF etc)
- \* Proprietary/domain specific (e.g. Blackboard, QMark, QTI)

- \* Object type

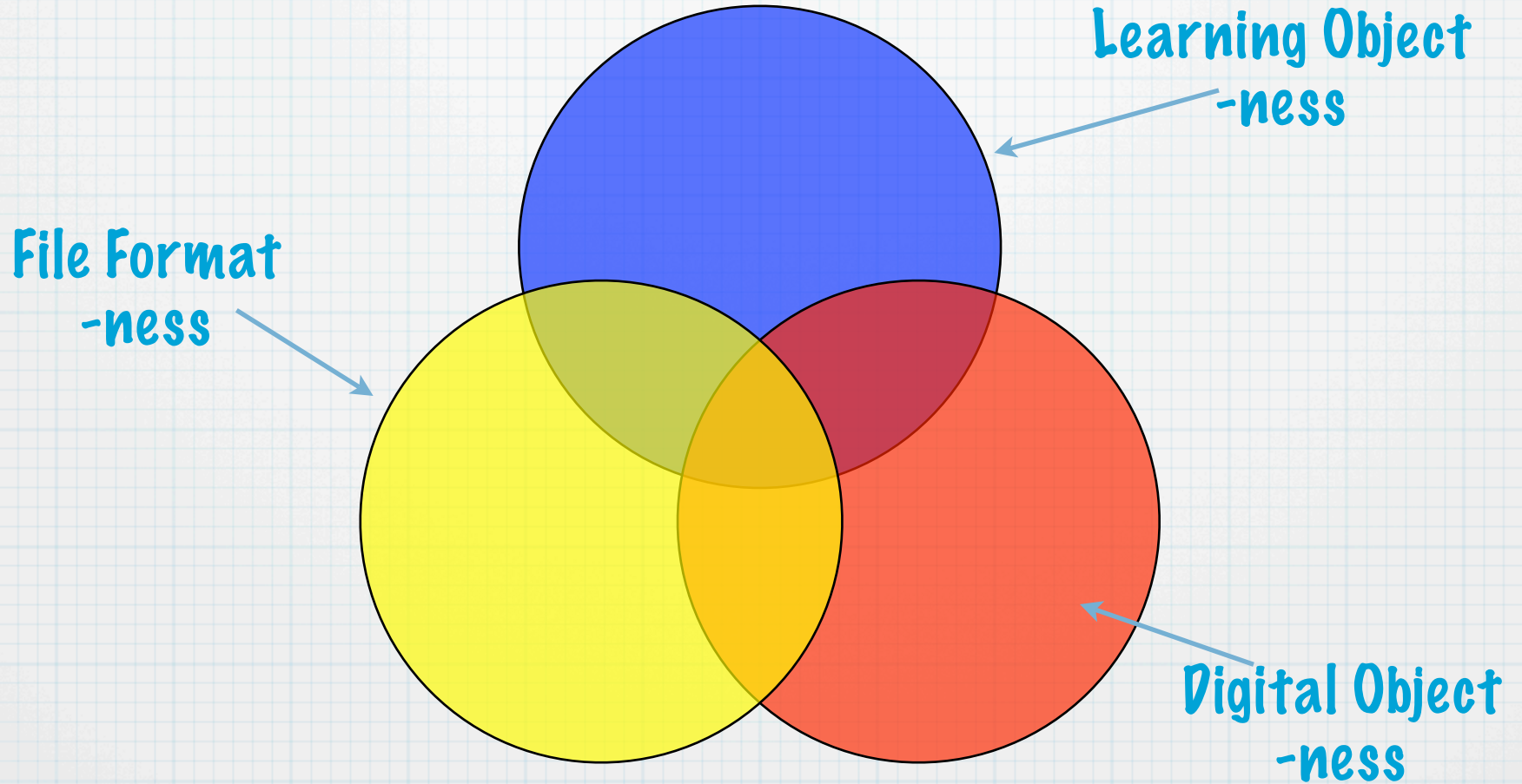
- \* Assembly of objects, units, files

- \* Package, e.g. SCORM

- \* Context



# SPs of LOs



# Classifying Learning Objects

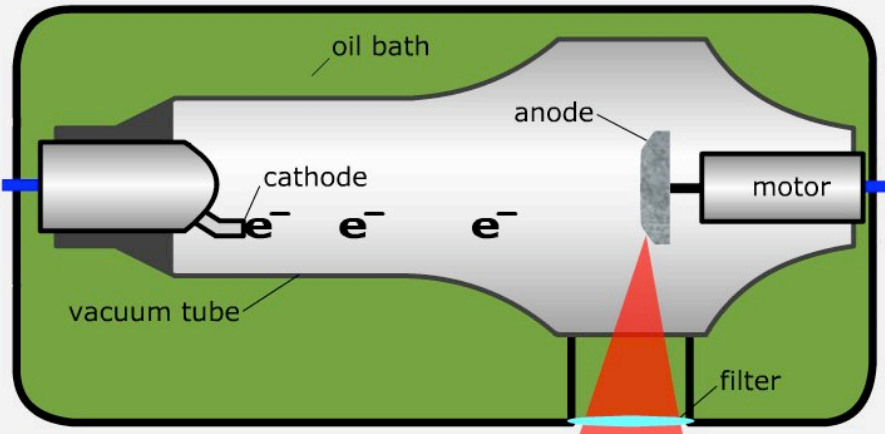
- \* By size: Course, Learning Episode, Learning Assembly, Information Object, Digital Asset (CETIS, 2001)
- \* By content type: multimedia, instructional, learning objectives, instructional software/tools, persons/organisations/events (IEEE)
- \* By purpose: instruction objects; collaborative objects; application objects; assessment objects (SmartForce Framework)

# Learning Object Typology Groups

- \* A. Functional
- \* B. Learning Object Classification (IEEE LOM)
- \* C. Learning Unit Classification
- \* D. Contextual
- \* E. People / roles
- \* F. Reusability
- \* G. Delivery
- \* H. Rights Management
- \* J. Digital object type (DCMI)
- \* K. Look and feel

# A Learning Object

The effect of mAS and KVp on x-ray beam quality and intensity



oil bath

anode

cathode

vacuum tube

motor

filter

mAS through cathode element  
= 70mAS

KVp across cathode and anode  
= 60kVp

**mAS** (press m and left or right arrow)

low high

**KVp** (press k and left or right arrow)

low high

**Beam Wavelength**

long short

audio on

vol

print version



# X-RAY BEAM MANIPULATION

## BEHAVIOUR

A5 Interactive  
F6 Applicable to other LEs  
G1 Software dependent  
G3 Format dependent  
G6 Delivered by ZIP  
G7 Delivered with XML Schema  
J6 Multimedia resource

## RENDERING

A5 Interactive  
C5 Video / Animation  
C9 Sound  
F5 Works in other applications  
K1 Fonts  
K2 Colours  
K3 Layout  
K5 English  
K6 Charset

## CONTENT

A1 Instructional  
A5 Interactive  
B1 Activity  
B3 Simulation Model  
B19 Demonstration  
C5 Video / Animation  
C9 Sound

## STRUCTURE

J6 Multimedia resource

## CONTEXT

D Contextual  
E1 Checked by Validator  
E4 Written by Author  
F2 Discoverable  
F12 in JORUM  
H2 DRM

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Learning Object

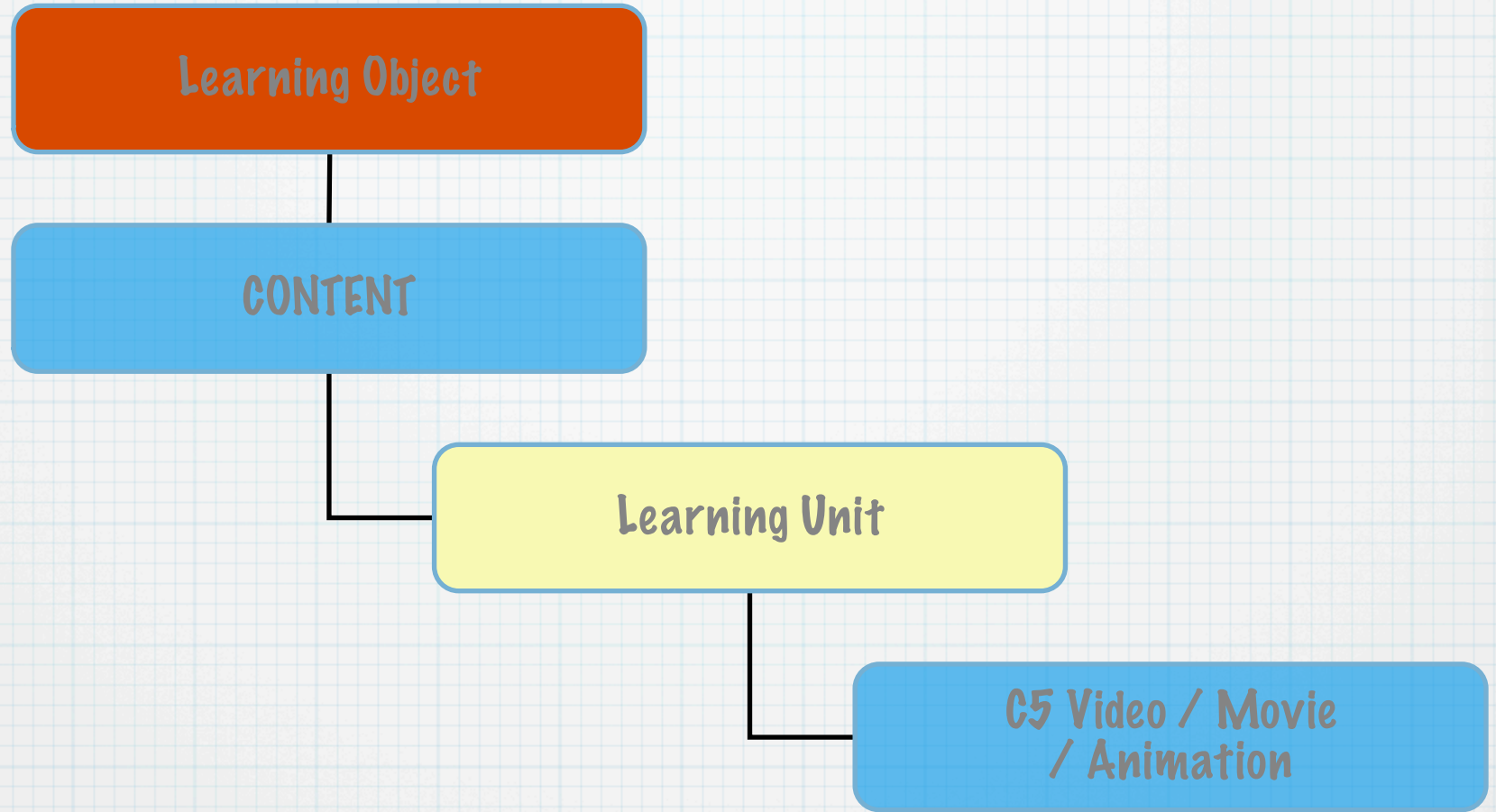
```
graph TD; A[Learning Object] --- B[CONTEXT]; B --- C[People/Roles]; C --- D[E4 Written by Author];
```

CONTEXT

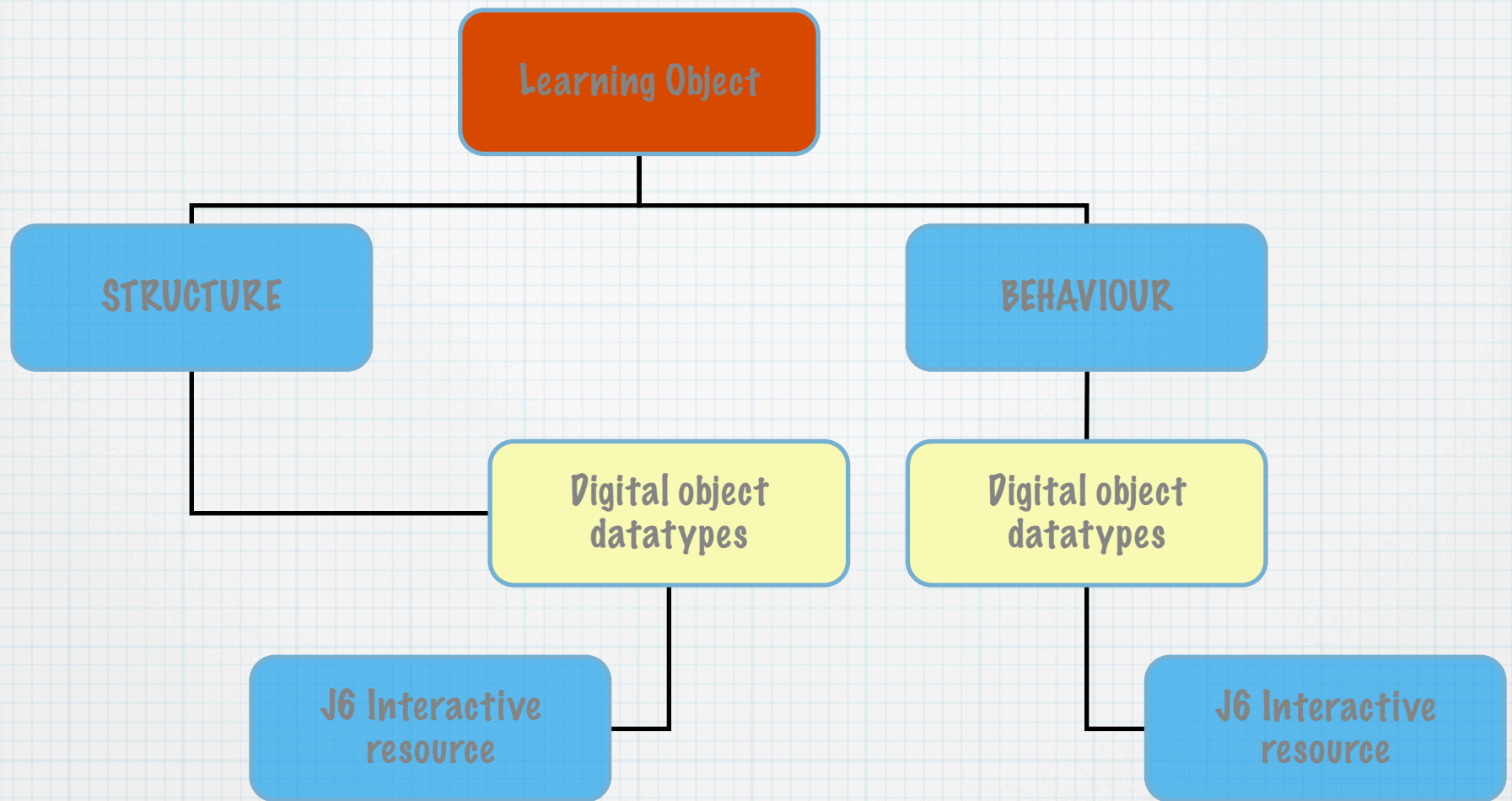
People/Roles

E4 Written by Author

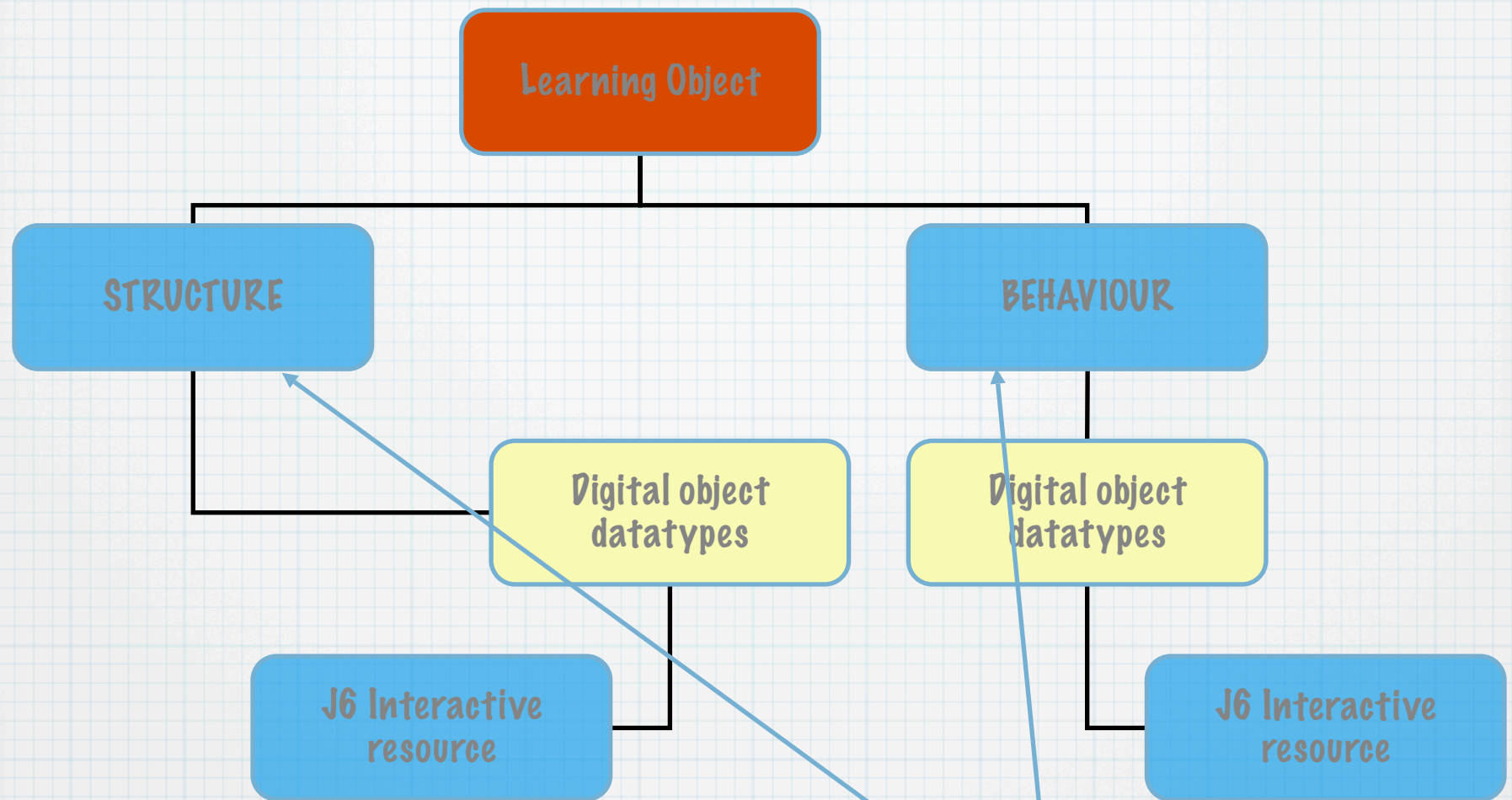
Object has been  
written by a named  
individual





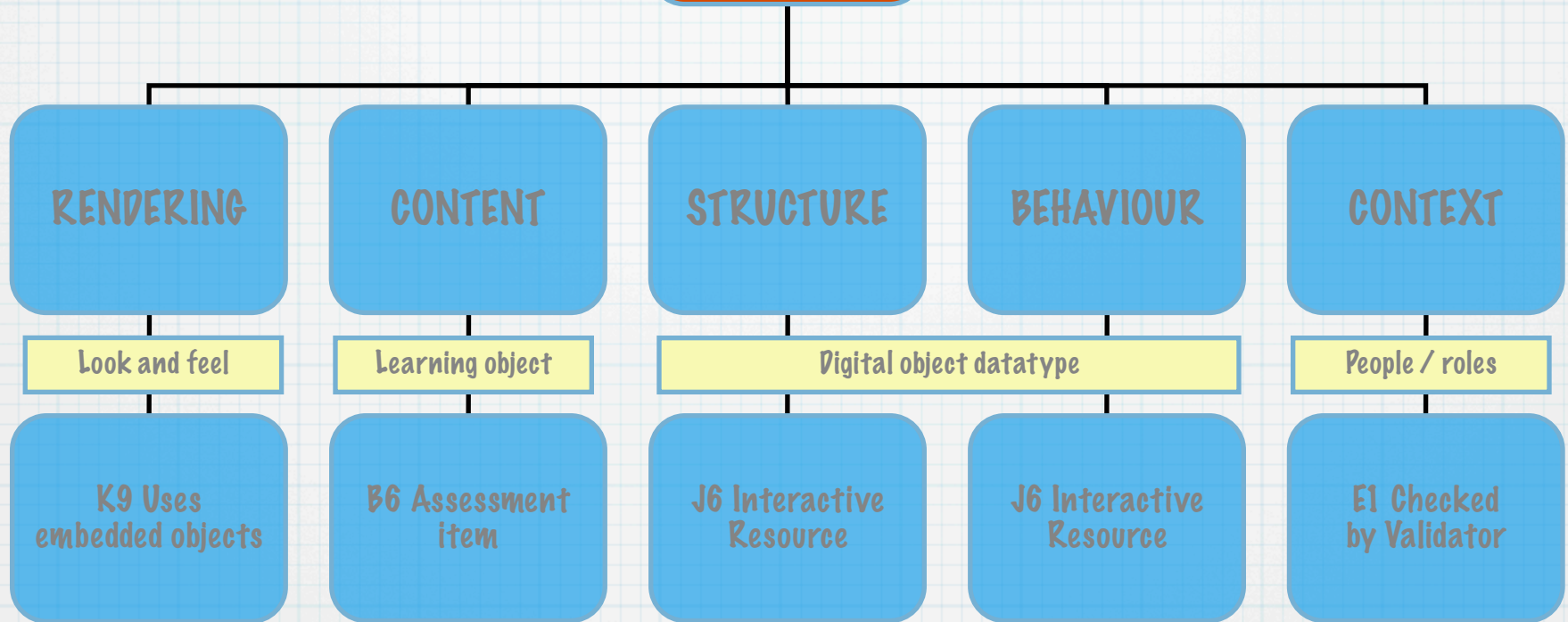


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# Assessment Learning Object



An item (e.g. a question/answer pair) that is designed to measure student learning. A complex object, consisting of a question together with its associated data such as score, feedback and either any media files required or links to those files.

# Conclusions

- \* Reusability: a strong theme
- \* Strong community drive for repurposing and reuse
- \* Rights management: leave for others (cp. PREMIS)
- \* SPs:
  - \* some inherited - structured text, moving image, etc.
  - \* others predominantly contextual - agents, objects, VLEs, individuals, organisations
- \* Assessment objects: rendering, behaviour, regulatory context



