Book of the Dead Project:
A new approach to Digital Editions of Ancient Manuscripts using CIDOC-CRM, FRBRoo and RDFa

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Background

• The Egyptian Book of the Dead is a funerary text:
  – consists of a number of codified *spells*;
  – often illustrated by a stereotypical set of *vignettes*;
  – represented on *papyri* and *linens* buried with the dead;
  – developed by a number of geographically diverse *traditions/schools*. 
Everyone’s Favourite Source...

We’ll come back to that

Book of the Dead

From Wikipedia, the free encyclopedia

For other uses, see Book of the Dead (disambiguation).

There was no single or canonical Book of the Dead. The surviving “papyri” contain a varying selection of religious and magical texts and vary considerably in their “illustration.” Some people seem to have commissioned their own copies of the Book of the Dead, perhaps choosing the spells they thought most vital in their own progression to the afterlife. The Book of the Dead was most commonly written in hieroglyphic or hieratic script on a papyrus scroll, and often illustrated with vignettes depicting the deceased and their journey into the afterlife.

Actually, in their very (textual) content
Malcolm Mosher

- Mosher’s first volume concentrates on Spells 1-16
  - collects the variants into versions representing the traditions;
  - provides an aggregate translation, paragraph by paragraph, with annotation of internal variability (e.g. late/early);
  - relates the versions to identified museum objects;
  - illustrates each spell with vignettes and original text fragments.
Malcolm Mosher

Dr. Malcolm Mosher: Egyptologist to Senior Software Designer

In 1982, while working on the requirements for his Egyptology PhD, Malcolm landed a job with Tandem. He worked on a variety of projects until 1988 when he was assigned to RDF.
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[...]

Remote Duplicate Database Facility, a disaster recovery program that monitored changes made to a database on a local primary system and replicated those changes to a database on a remote backup system.
British Museum

• As one would expect, the BM has some of these objects:
British Museum RDF

• ... and publishes these in RDF:

(as in the W3C standard for data publication, Resource Description Framework)
British Museum SPARQL

• ... allowing querying in SPARQL

(the W3C standard for querying RDF)

(N.B.: this is quite a crude query to achieve a broad estimate)
British Museum SPARQL

- ... allowing querying in SPARQL
- so we can (somewhat) answer that earlier question:

```
PREFIX ecrm: <http://erlangen-crm.org/current/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>

SELECT DISTINCT ?material (COUNT(DISTINCT ?object) AS ?count)
{ ?Object ecrm:P128_carries/rdfs:label "Book of the Dead" ;
  ecrm:P45_consists_of/skos:prefLabel ?material }
GROUP BY ?material
ORDER BY DESC(?count)
```

(N.B.: again, this query could be refined)

No more SPARQL, I promise...
British Museum ‘Terminology’

- From a given starting point, e.g.: Either from this ID or by text search (plus a bit of work)
“Follow your Nose”

- We can easily (without SPARQL) find interesting relationships:

  ![Diagram showing relationships between resources in a museum collection database.](image)
CIDOC-CRM

• Modelling these relationships is what RDF is for after all:

CIDOC-CRM

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• The CRM ontology defines:
  – properties to provide a shared conceptualisation of kinds of relationship
CIDOC-CRM

- Modelling these relationships is what RDF is for after all:

  ![Diagram](Image)

  - **bm-obj:**YCA23978
    - **rdf:**type
      - **crm:**E22_Man-Made_Object
  - **bm-person:**54984
    - **rdf:**type
      - **crm:**E21_Person

  **crm:**P62_depicts

- The CRM ontology defines:
  - **properties** *(Pn)*, a shared conceptualisation of kinds of relationship
  - **classes** *(En)*, a shared conceptualisation of kinds of resources
• Ultimately we can use these classes and properties to build a rich model of our data:
Requirements beyond CRM

- CRM provides a good model for the objects.
- In order to model Mosher’s conceptual structure, however, we need to model:
  - the wholly conceptual ‘Book of the Dead’;
  - the decomposition into spells, paragraphs, etc.;
  - Mosher’s (whole) volume;
  - Mosher’s conception of coherent versions/traditions;
  - Mosher’s translations;
  - the relationships to vignettes;
  - spell (original) texts, vignettes, and their relationship to the objects that carry them.
FRBRoo

- FRBRoo:
  - is a sister ontology to CRM and natural used in combination with it;
  - like CRM, takes an ‘object-oriented’ approach to formalising a foregoing Entity-Relationship model;
  - models precisely these implied classes (Fn) and relationships (Rn) –
    - **Works** are the product of **Expressions**, which are made physically available through **Manifestations**
BoD in CRM and FRBRoo
BoD in CRM and FRBRoo

We'll come back to this after a short detour
• ResearchSpace
  – provides a collaborative research environment;
  – provides a number of tools to facilitate this –
    • search and browse,
    • data annotation,
    • image annotation, (and many others);
  – integrates RDF from multiple sources (per project);
  – without explicit SPARQL, etc.
ResearchSpace Search

- Semantic search based on terminology, not just free text:
ResearchSpace Search

- Semantic search using explicit (but possibly abstracted) relationships:
Data annotation allows us to question and add new relationships, e.g.:
Data annotation allows us to question and add new relationships, e.g.:
Given an image (associated with an object), user can
- create a geometric outline within image
- relate this new component resource to terminology
Text Annotation

- So what about annotations within text?

**BD 1**

§T  Beginning of the spells of going forth by day,² **raising up the glorious ones** in the necropolis,³ what is spoken on the day of burial, of entering after going forth by Osiris-N.⁴

§P  Words spoken by Osiris-N.⁵

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Fig. 1.1: §T of BD 1, Version 1 - BM 10558.

Fig. 1.2: §T of BD 1, Version 1 - N3281.

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¹ Saite/Memphite papyri: Cairo 40029, Iahetenncht (much missing), K3001, Hespaselt, Tasherei; BM 10558, N3281 (§T to midway in §6 omitted), K3001 (only §T through §3; rest omitted). Nicholson, I.85, line 100, Bandages: BM #1 (§R omitted), BM #71, BM 10609 (only §7-§9 survive; §R omitted), I1737 (§9-§R lost), Getty A (§T, §P, and 99% of §1 lost; §R omitted), Getty C (§T omitted), Museum (only §9 is complete), N3057 (HG text; §4-§6 lost; remaining text), N3058 (§T omitted), UC32419 (only §5 through §9 survive; §R omitted). Iheban IL papyri: BM 10837, BM 10838 (much lost, §9-§R omitted), BM #111, N3072, N3126, N3281. HG papyri: Milbank, Parma (§6-§R omitted), Turin 1763, Total Documents 30. I use notes for BD 1 only to surviving text without noting what is lost. Regarding Cairo 40029, Milbank, K3057, Nicholson RP5, Turin 1763, see comments after translation.
Several Choices

- Stand-off mark-up (common in NLP)
- In-place mark-up with XML tagging
  - A custom schema
  - Shoe-horning into existing schema, i.e. TEI
- In-place mark-up with RDFa

- Need to define semantics
- Need to process into HTML/UI
- Can derive CRM (but not FRBRoo?) semantics
- Can derive HTML/UI
...
In contrast with other approaches:

- XHTML/RDFa *is* already HTML;
- RDFa allows embedding of CRM, FRBRoo and any other vocabulary (classes and properties) we choose; *(Schema.org? OpenGraph?)*
- allows ‘distillation’ of RDF by generic means;
- works alongside the Web model (being our target), disambiguating the hyperlinks we’d make in any case.
• Questions?
• Rotten tomatoes?