HEALLINK
Hellenic Academic Libraries Link

Hellenic Academic Libraries Link

HEAL-Link activities and plans on annotating, organizing and linking academic content

Contributors:
N. Mitrou, N. Konstantinou, D. Kouis, P. Stavrou, D. Spanos

Presentation by
Prof. Nikolas Mitrou, NTUA
HEAL-Link chairman

HEALLINK
Hellenic Academic Libraries Link

HEAL-Link profile in numbers

Hellenic Academic Libraries-Link (known as HEAL-Link) was founded in 1998

- **Members & Associated Members**: > 50 Higher Education Institutes, Research Centers and other Public Sector Organizations
- **Cooperating organizations**: > 30 Public and Private Sector Libraries and Organizations
- **Academic & Research community**: > 13.000 academic staff (faculty members & researchers)
- **Students:** > 350.000 under/post graduate students
- **On line content** : > 14.000 scientific journals, 30.000 eBooks, various digital databases etc. > 4.000.000 bibliographic records
- **Current ongoing projects:** > 13 M€ funding for upgrading/creating digital services

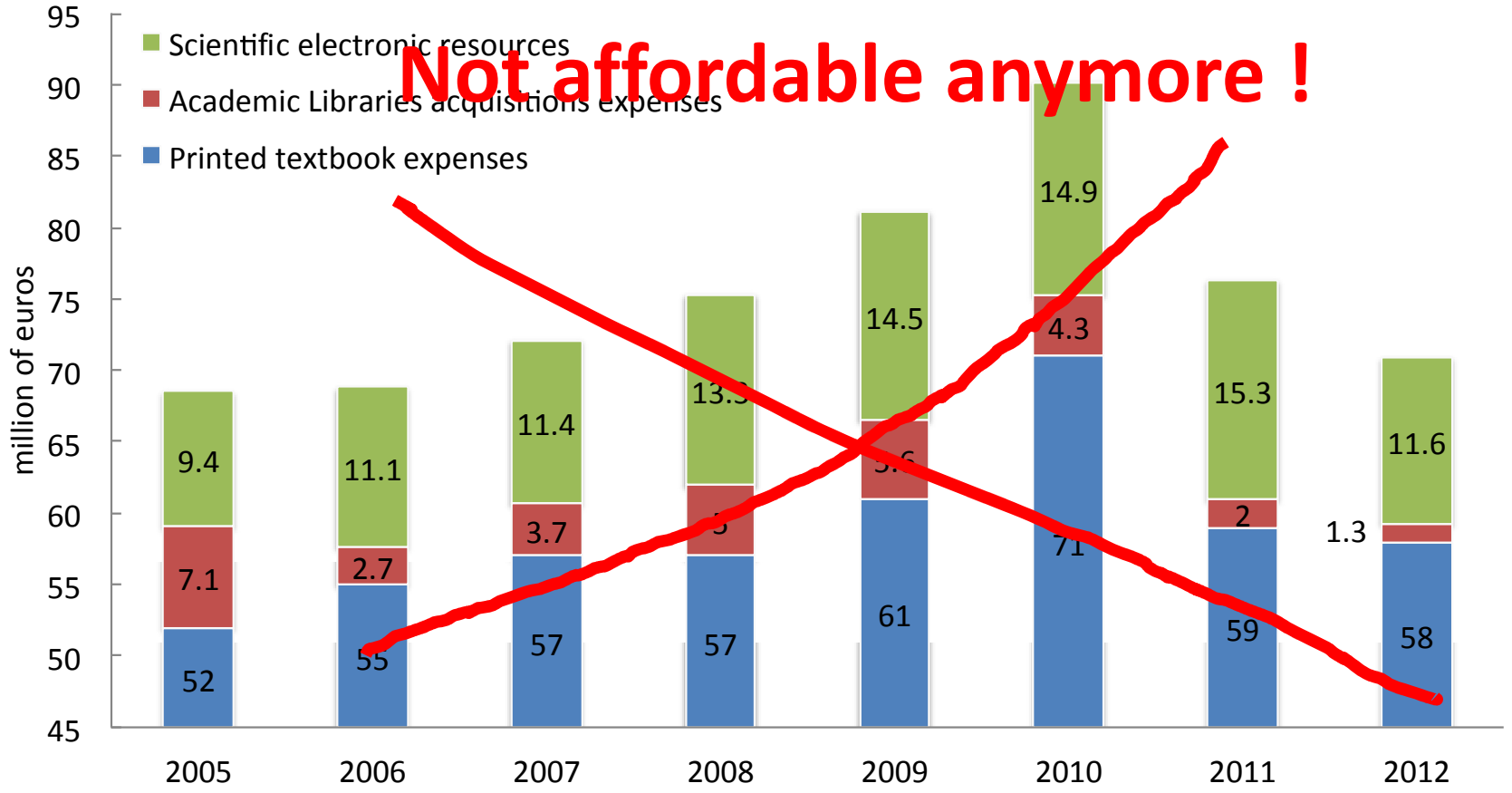
HEALLINK
Hellenic Academic Libraries Link

HEAL-Link main action lines

- **Economise** resources
- Provide improved services for supporting teaching and research within academic units
- Set a **common strategy** regarding **access** to **digital material**, allowing information sources to be managed effectively state-wide
- Promote adoption of common performance standards and indices for library services
- Coordinate the development of the collections of the member-libraries

HEALLINK
Hellenic Academic Libraries Link

Expenditure for access to academic textbooks and scientific on-line sources



HEAL-Link's current activities towards Open Access

Two **co-financed** projects (national & EU funds):

- **Advanced Central Services of HEAL-Link's Open Access Digital Libraries** (2010-2015, 4.5M€)
- *> 30 projects executed by Academic Libraries (HEAL-Link members) with a total budget exceeding 23 M€*
- **Hellenic Academic E-books** (2012-2015, 8.3M€)

European Union
European Social Fund

OPERATIONAL PROGRAMME
EDUCATION AND LIFELONG LEARNING
investing in knowledge society
MINISTRY OF EDUCATION & RELIGIOUS AFFAIRS
MANAGING AUTHORITY

NSRF 2007-2013
EUROPEAN SOCIAL FUND

Co-financed by Greece and the European Union

European Union
European Regional Development Fund

digitalgreece
Everything is possible
Operational Programme "Digital Convergence"

NSRF 2007-2013

The project is co-financed by Greece and the European Union

Advanced Central Services of HEAL-Link's Open Access Digital Libraries

HEAL-Digital resources and Institutional Repositories service (HEAL-DIR)

- Supporting and coordinating actions within the individual academic institutions in order to develop and/or upgrade their own institutional repository conforming to common standards which enable interoperability
- A common physical infrastructure and software platform for most Institutions
- A common set of metadata (healmeta)

- **HEAL Meta-search Service**

Advanced Central Services of HEAL-Link's Open Access Digital Libraries (cont.)

AMELib

(Accessible Multimodal Electronic Library)

AMELib digital repository provides books to print-disable students through a set of tools for converting printed books to audio-books as well as other forms.

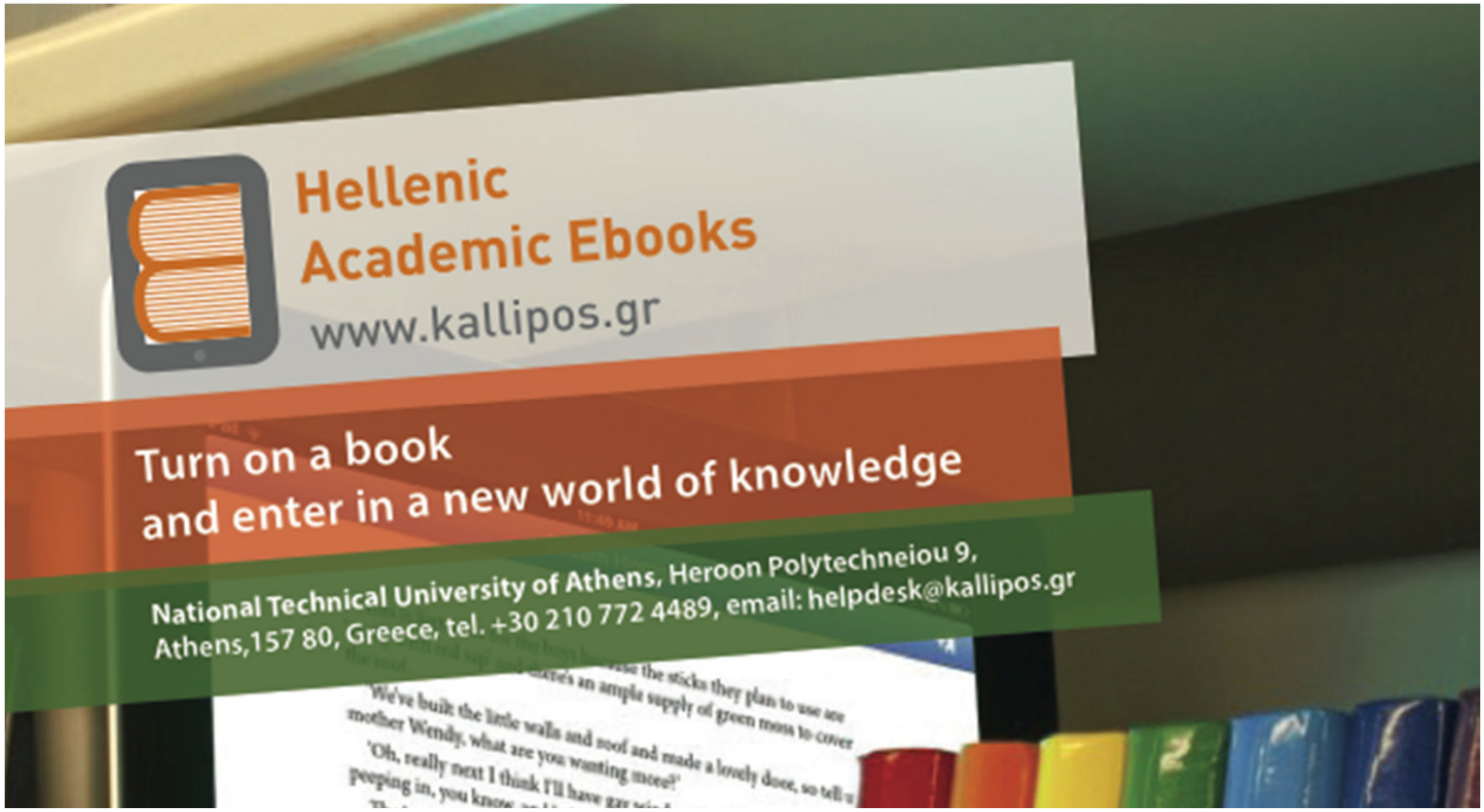
Advanced Central Services of HEAL-Link's Open Access Digital Libraries (cont.)

HEAL-Link Catalogues and Authorities/Indexing Service (HEAL-CAS)

- **Electronic Authorities / Indexing Service**
  - Greek Researchers and Research Institutes
  - Greek Scientific Journals
  - Greek Scientific Digital Resources
- **ILSAS (Integrated Library System as a Service)**
- **Electronic plagiarism detection service**
  - **HEAL-HelpDesk**

HEALLINK
Hellenic Academic Libraries Link

Hellenic Academic E-books



The service “Kallipos – Hellenic Academic Electronic books” aims to create and provide, in **open access**, a large number (more than 700 in the 1st phase) academic textbooks as e-books.

HEALLINK
Hellenic Academic Libraries Link

Hellenic Academic E-books (cont.)

Main features:

- Content mainly in the greek language
- Open access
- Multiple formats (pdf & Epub)
- Interactive & multimedia elements (video, sound, simulations etc.)
- **Learning objects**
- **Complete metadata description (healmeta)**

HEALLINK
Hellenic Academic Libraries Link

E-books vs e-courses

An e-book

- Is a linked collection of e-learning units, with a defined structure
- Is self-contained and portable within a standardized container, and presentable on special devices (e-readers)
- Has a unique theme and a defined sequence of reading
- Can contain multimedia elements and animations (enhanced e-book), as far as they can function locally
- Each stable edition can acquire a unique identifier (like the ISBN)
- Although outgoing links are allowed, all the basic building elements should be local, in order to assure the basic functionality in a non-connected mode

An e-course

- Is a loosely-bound set of e-learning materials
- Is provided usually by a Web server and presented by ordinary browsers
- Easy to incorporate multimedia elements, as well as animations in the form e.g. of servlets and applets
- Content can be changed dynamically. This may be a problem for assigning unique identifiers to individual content elements
- References to external components are easily handled

HEALLINK
Hellenic Academic Libraries Link

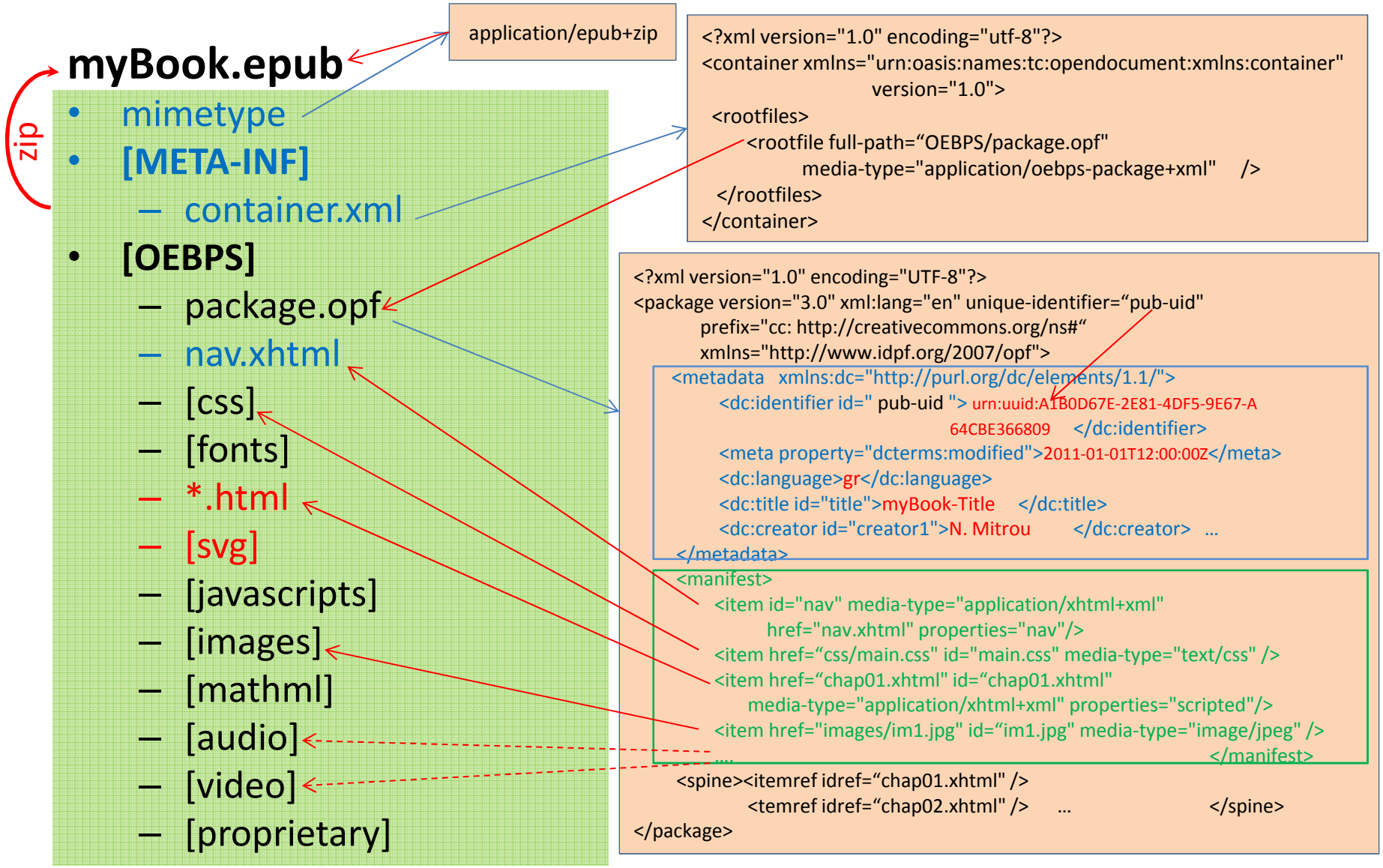
Epub: an e-book container

Epub is a distribution and interchange format standard for digital publications and documents:

- Epub3 – the latest version
- Multiple resources wrapped into a single package
- (XHTML) HTML5 and SVG the primary content formats
- Multimedia and scripting supported (as defined in HTML5 and SVG)
- Human- and machine-readable navigation information
- Referencing document elements through the epubcfi (canonical fragment identifier)
- A minimal (but expandable) dc-based set of metadata
- Structural semantics

HEALLINK
Hellenic Academic Libraries Link

A typical Epub3 container structure



HEALLINK
Hellenic Academic Libraries Link

Ebub: Identifiers

- **Unique EPUB identifier**
  - Fully qualified URI (not required by the standard, but strongly recommended)
  - Example

```
<package  …  unique-identifier="pub-uid">
  <metadata xmlns:dc="http://purl.org/dc/elements/1.1/">
     <dc:identifier id="pub-id">urn:doi:10.1016/j.iheduc.2008.03.001</dc:identifier>
     <meta property="dcterms:modified">2013-11-26T12:00:00Z</meta>
     <meta refines="#pub-id" property="identifier-type" scheme="onix:codelist5">06</meta> …
  </metadata>
```

  - Unique package identifier: unique EPUB identifier + last modified date

    e.g. urn:doi:10.1016/j.iheduc.2008.03.001@2013-11-26T12:00:00Z

- **Ebup canonical fragment identifier** (http://www.idpf.org/epub/linking/cfi/)
  - Defines a standardized method for referencing arbitrary content within an EPUB® Publication through the use of fragment identifiers
  - Syntax: myBook.epub#epubcfi(path , [range])
  - Example: myBook.epub#epubcfi(/6/4[chap01ref]!/4[body01]/10[para05]/3:10)

HEALLINK
Hellenic Academic Libraries Link

Why Epub ?

Main assets

- **Uses the web standards and technologies (HTML5, SVG)**
- **Is promoted by big names in the publishing industry**

  (e.g. the Association of American Publishers/AAP)

HEALLINK
Hellenic Academic Libraries Link

Learning objects

- Definition: "any entity, digital or non-digital, that may be used for learning, education or training" (IEEE)
- Features:
  - "small" entities (typical duration of presentation or reading: 5-20 minutes)
  - self-contained in their own micro-container (file, folder, etc)
  - uniquely identifiable, accessible and portable
  - have an educational value
  - reusable in compositions of larger LO (e.g. e-books)

- Examples:
  - interactive figures or maps
  - algorithms
  - mathematical theorems
  - audio-video elements
  - slide shows
  - book chapters or sections

HEALLINK
Hellenic Academic Libraries Link

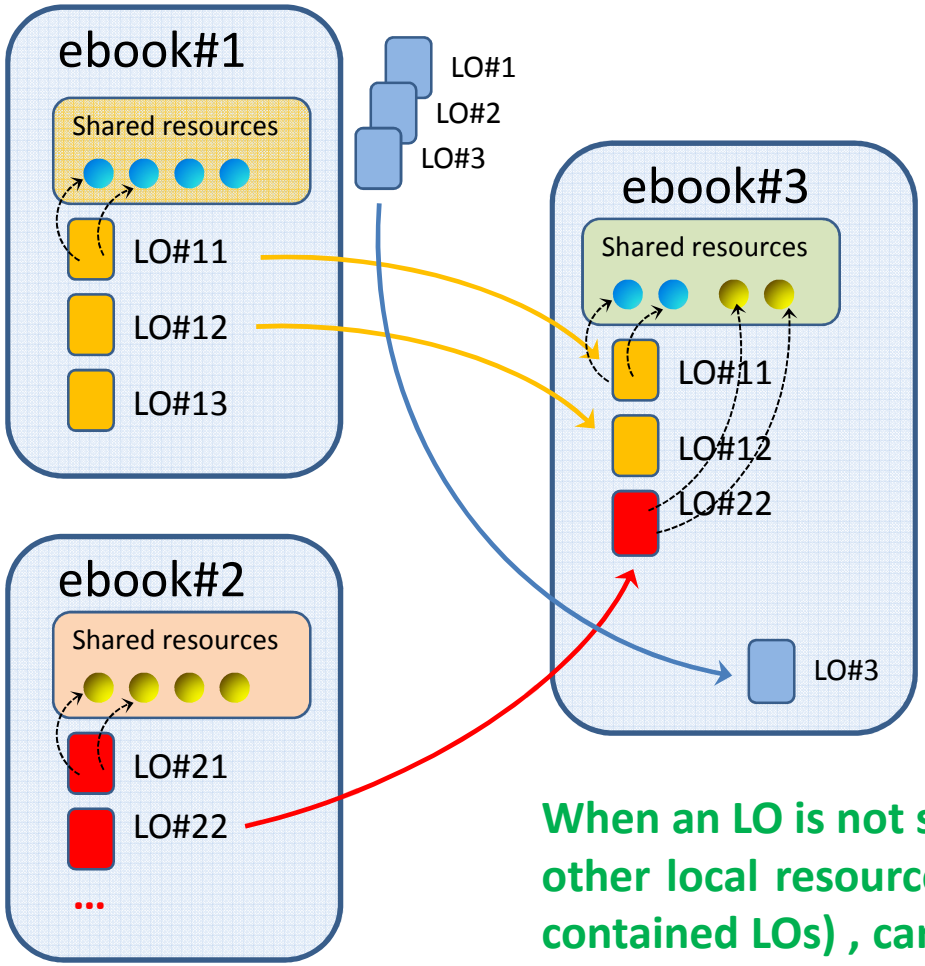
Learning objects (cont.)

- A novel implementation feature of the Hellenic Academic E-books
- Preserved within an e-book aggregator, with unique, dereferenceable URIs
- Self-contained, portable and re-usable for composing virtual e-books

- Vocabularies-Metadata: a combination of subsets fromsimple and widely used ones
  - General (dc, …)
    - creator, title, creationDate, …
  - Structural (Epub, OAI-ORE)
    - typeOf {chapter, division, table, figure, toc}, partOf-hasPart…
  - License (cc, …)
  - Bibliographic (bibo, …)
  - Scholar - learning (LOM, …)
    - prerequisites, interactivityLevel, difficulty, technicalRequirements, …
    - hasSubject {subject headings}

HEALLINK
Hellenic Academic Libraries Link

Reusing LO for composing new e-books



When an LO is not self-contained but refers to or uses other local resources (style-sheets, javascripts, other contained LOs) , care should be taken in order to take with it all the required resources, maintaining their relative position within the file structure.

HEALLINK
Hellenic Academic Libraries Link

Reusing LO for composing new e-books (cont.)

Issues to be taken care of

- In putting resources from different containers into a shared space, there might be cases of name conflicts (same name, different functionality)

Possible solution: Not use shared spaces. Isolate each LO along with its associated resources within its own micro-container

HEALLINK
Hellenic Academic Libraries Link

Reusing LOs for composing new e-books (cont.)

An example from Wikipedia

Otto cycle

From Wikipedia, the free encyclopedia

See also: Otto engine and Four-stroke engine

An **Otto cycle** is an idealized thermodynamic cycle w
functioning of a typical spark ignition reciprocating pis
thermodynamic cycle most commonly found in automo

The Otto cycle is constructed out of:

Top and bottom of the loop: a pair of quasi-paralle
processes
Left and right sides of the loop: a pair of parallel is
processes

The book is a collection of relevant Wikipedia articles

Book:Thermodynamics

From Wikipedia, the free encyclopedia

This is a **Wikipedia book**, a collection of Wikipedia articles that can be easily saved, rendered electronically, and ordered as a printed book. For information and help on Wikipedia books in general, see **Help:Books** (general tips) and **WikiProject Wikipedia-Books** (questions and assistance).

[Download PDF] [Download ODT] [Download ZIM]
[Open in Book Creator] [Order Printed Book]

[About] [FAQ] [Feedback] [Help] [WikiProject] [Recent Changes]

Thermodynamics [edit]

Everything you need to know [edit]

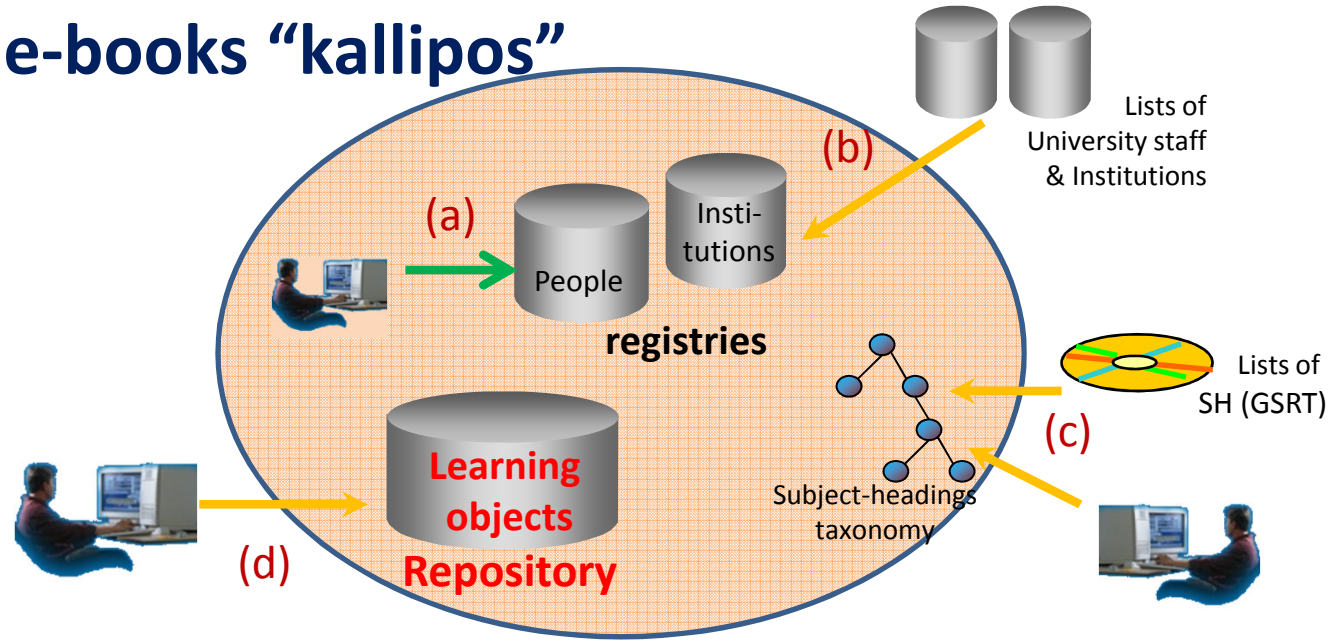
Chapter 1. Introduction
- Classical Thermodynamics
- Statistical Thermodynamics
- Chemical Thermodynamics
- Equilibrium Thermodynamics
- Non-equilibrium Thermodynamics

Chapter 2. Laws of Thermodynamics
- Zeroth
- First
- Second
- Third

Chapter 3. History

HEALLINK
Hellenic Academic Libraries Link

The HEAL-Link e-book aggregator



Development steps

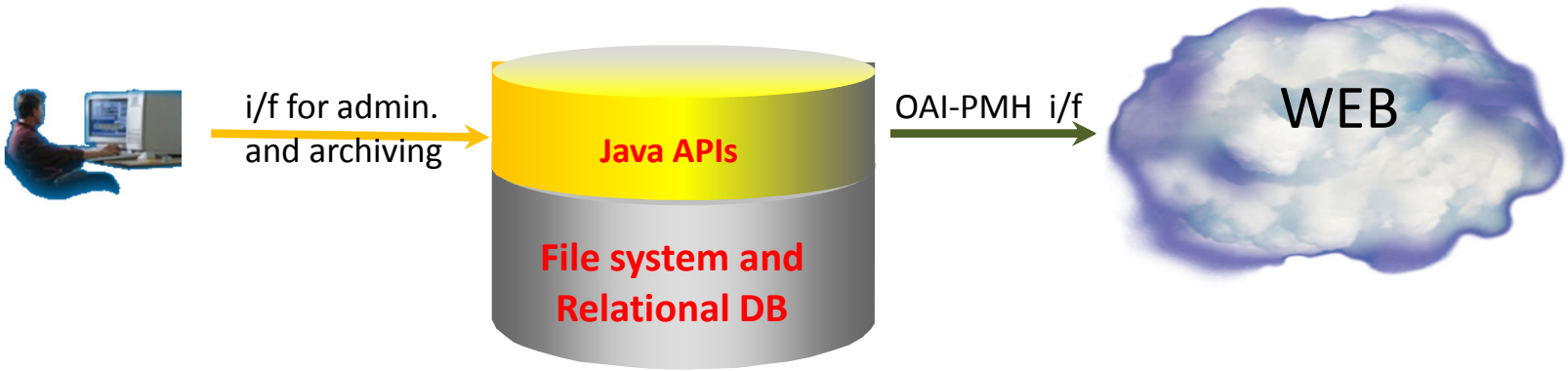
- (a),(b) Develop-populate registries of contributors (university staff) and Institutions
- (c) Compile subject-headings taxonomies and metadata schema (healmeta)
- (d) Archive learning objects and books, with the appropriate metadata

HEALLINK
Hellenic Academic Libraries Link

The HEAL-Link e-book aggregator (cont.)

Learning Objects Repository

- **Dspace platform**
  - Open-source software (initially by MIT and HP Labs → Dspace Foundation)
  - Content objects in a file system
  - Metadata in a relational database (Postgres)
  - OAI-PMH interface for metadata harvesting
  - Does not support the RDF model (Fedora does)
- **Same repository as for the rest of the academic content (publications, etc.) [Institutional Repository]**



HEALLINK
Hellenic Academic Libraries Link

Learning objects as Linked Data

Guidelines

- ✓ **Each LO, being either within an epub container or stand alone, will be assigned a dereferencable URI**
- ✓ **The metadata (healmeta) will be mapped to elements of widely used vocabularies (dc, bibo, Dbpedia, …) to the maximum possible extent. For the rest, new concepts/properties will be devised**
- ✓ **The thematic classification schemes will be organized by means of the SKOS vocabulary and interlinked with well-known taxonomies (LCSH, DDC)**
- ✓ **Outgoing and incoming links will be developed and advertized**
- ✓ **A live extractor may be developed for extracting information from the repository about modified or newly added LOs through the OAI-PMH interface (much like the DBpedia gets information from Wikipedia)**
- ✓ **…**

HEALLINK
Hellenic Academic Libraries Link

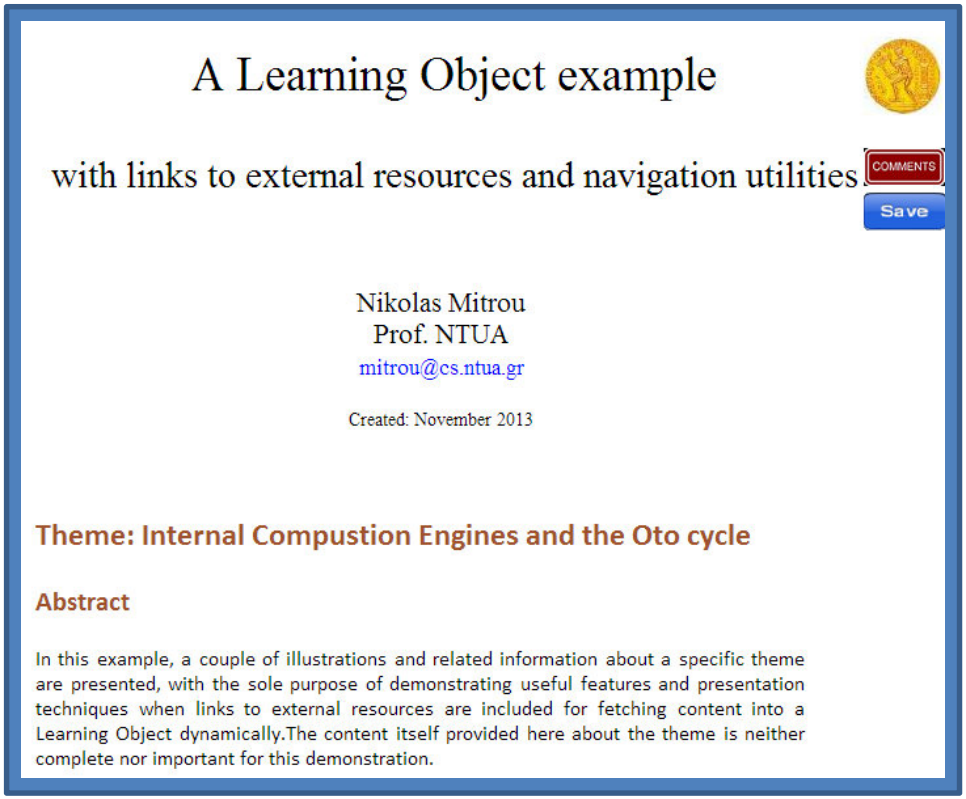
Learning objects as Linked Data (cont.)

Incoming and outgoing links

- **Incoming links may refer to the Learning Objects preserved within the aggregator, like to any other content element on the web**
- **E-book readers, e-book composers or mashup applications will be able to discover, access and use the LOs by following these links**
- **Outgoing links may refer to any resource on the network**
- **In general, e-books are written and red as stand-alone content entities. E-readers do not require a network connection in order to present the content of an e-book. In such a connectionless mode of operation any outgoing links remain dormant; they can only be activated whenever the reader gets connected to the network**
- **The basic functionality and appearance of an e-book should not depend on external resources**

HEALLINK
Hellenic Academic Libraries Link

Example

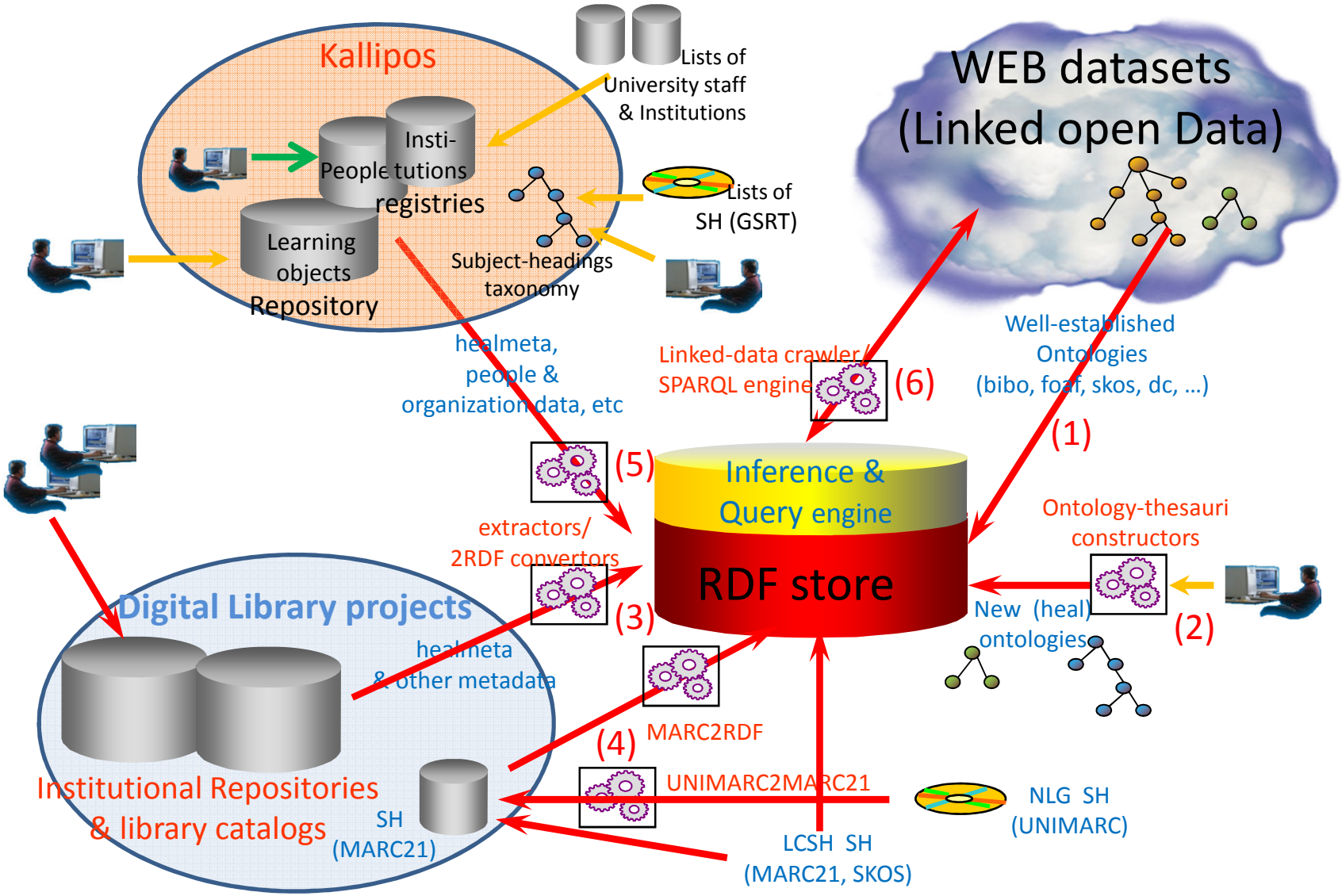


- Presents two animated illustrations of the chosen theme
- Demonstrates the encapsulation of content from external resources (HTML pages or linked open data, e.g. DBpedia)
- Provides a set of navigation and comment compilation utilities
- Available by a server (as HTML) or within an epub3 container; so can be played by ordinary browsers or epub3-readers (e.g. Readium)

http://pyrros.cn.ntua.gr/epub/LO-Otto_cycle-html.html

HEALLINK
Hellenic Academic Libraries Link

Final target: semantic integration



HEALLINK
Hellenic Academic Libraries Link

Ideas for a Horizon 2020 project

?

THANK YOU !