Some thoughts
on the near-future
Digital Mathematics Library

Thierry Bouche

Cellule MathDoc & institut Fourier, Grenoble

Launching DML-CZ
Czech Digital Mathematics Library
Charles university, Prague, 11th June 2007

NUMDAM   EuDML   cedram

Outline

1. **The mathematical literature**

2. **The electronic mathematical literature**

3. **The Digital Mathematical Library**

4. **Implementation**

5. **Conclusions**

The mathematical literature
Specificities

- Mathematical litterature never becomes obsolete
- It's valid only as a *whole*, building a wide network of references
- It's useful to other sciences in an *asynchronous* fashion
- It must be carefully archived, indexed and preserved
- It must be accessible over the long term

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Milestones

1665 Birth of scientific journals (*Journal des sçavans, Philosophical transactions*)

1800 About 200 journals where math articles are published

1810 First math-only journal (*Annales de mathématiques pures et appliquées, aka Annales de Gergonne*)

1850 About 1000 mathematical research articles published each year

1950 About 6000 mathematical research articles published each year

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- Instant preprint circulation (labs, arXiv, email, home pages)
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- About 50% citations in today's bibliographies are more than 10 years old
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Interrogations

- How open archives and formal journals fit together?
- Reliability of digital libraries?
- Who pays for electronic-only free access journals?
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Wishes (IMU 2002, 2005)

- Free metadata and navigation

- Eventual open access (moving wall)

- No long-term economic, legal, technical barriers

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- GDZ retrodigitised, free, not only German

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- project Euclid retrodigitised and publishing platform, not-for-profit

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- Springer publishing platform, retrodigitised content as one optionnal package (English only)

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Journal accessibility report

Acta math. Mittag-Leffler[†] (1882-2005) ; Springer (1882-1997), Springer (1997-)

Ann. Math. JSTOR (1884-2001), Euclid (2001-)

Bull. LMS CUP (1865-)

CRAS Gallica (1835-1965) ; Elsevier (1997-)

Crelle GDZ (1826-1997) ; Walter de Gruyter (1999-)

Duke Math. J. Euclid (1935-1999), Euclid (2000-)

Liouville Gallica (1836-1935) ; Elsevier (1997-)

Math. Ann. GDZ (1869-1996) ; Springer (1869-1997), Springer (1997-)

Pacific J. Math. Euclid (1951-)

Théor. nombres Bordeaux Séminaire : GDZ (1972-1988) ; Journal : NUMDAM (1989-2003) ; EuDML (1994-2005) ; CEDRAM (1989-2006)

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Digital Mathematical Library
The vision

"In light of mathematicians' reliance on their discipline's rich published heritage and the key role of mathematics in enabling other scientific disciplines, the Digital Mathematics Library strives to make the entirety of past mathematics scholarship available online, at reasonable cost, in the form of an authoritative and enduring digital collection, developed and curated by a network of institutions."

(Cornell NSF project 2002, endorsed by IMU 2006)

A digital library?
Context

- Libraries buy and store publisher's (paper) production

- They preserve it and provide access to their patrons

- Why should this change because of a format move?

- Will the mathematical knowledge remain part of our common, freely accessible heritage?

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Traditional components—digital counterparts

Selection Selecting collections by subject, document type. . .

Acquisition Retrospective digitisation *and*
ingesting current production

Cataloguing Capture, produce, import, enhance metadata

Archiving Collections, file names, identifiers

Preservation Hardware maintenance, emulation, management. . .

Access Easy access, file conversions, interfaces maintenance

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"The Digital Mathematics Library strives to make
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Implementation
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Collections should be

- Cared for and accessed locally
  (digital files preserved physically at each participating institution;
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- Usable, accessible globally
  (though a virtual union catalogue, and metadata sharing
  with cooperating services like reviewing databases
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- Mathematicians are waiting for a reference digital library
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- It has to be a public service (at least not-for-profit)
- lasting for ever
- But it should keep current!
- Immediate free access is *not* mandatory
- Eventual open access *is* mandatory
- The French NUMDAM+CEDRAM was a preview
- DML-CZ is a promising new one!
- The foreseen EuDML could be the first large-scale implementation!

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The EuDML project
Abstract

"EuDML will design and build a collaborative digital library service

- It will collate the currently distributed content by the national providers
- It will create a single access gateway for heterogeneous and multilingual collections
- A document network will be constructed by merging and augmenting the information available about each document from each collection
- And matching documents and references across the entire combined library.
- This will add value and accessibility to each collection
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