Digital Mathematics Library in Japan as an Overlay of Digital Repository Systems

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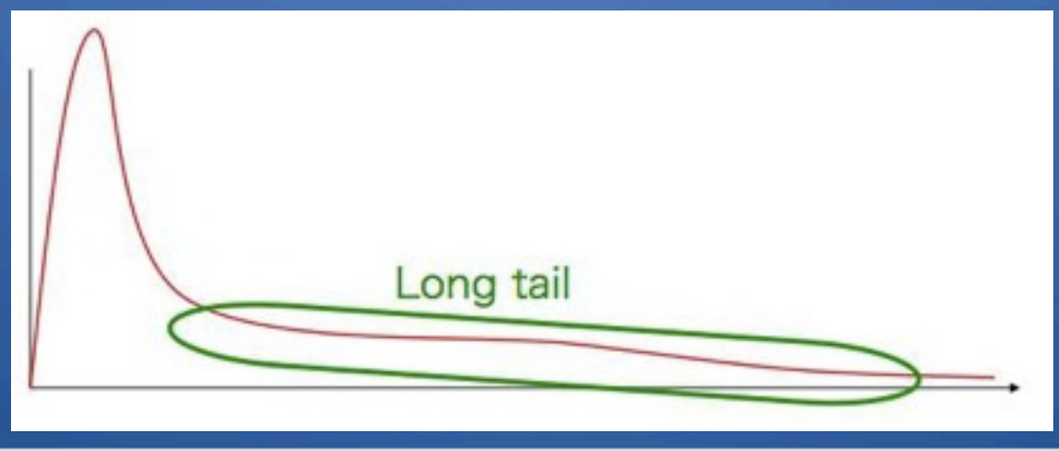
Scholarly Communication in Math

- Literature's everything:

S.C. in Math essencial to general S.C.

- Small journals matter:
  - –Small ⇔ about 100 articles per a title.



Digital Mathematics Library (DML)

- National Portal(s) on Mathematics
  - –proposed by International Math. Union
  - –Portals in France, Germany, Russia, India,… are already developed.

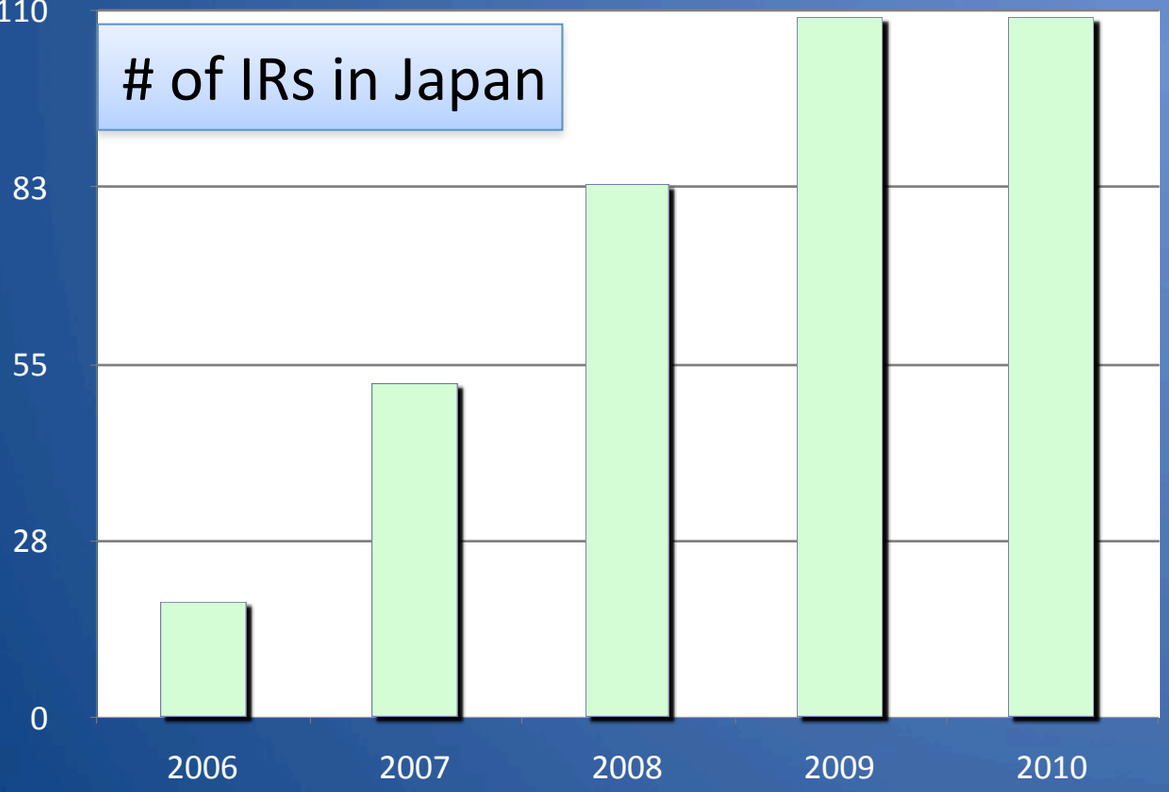
Goal: Construction of DML-JP

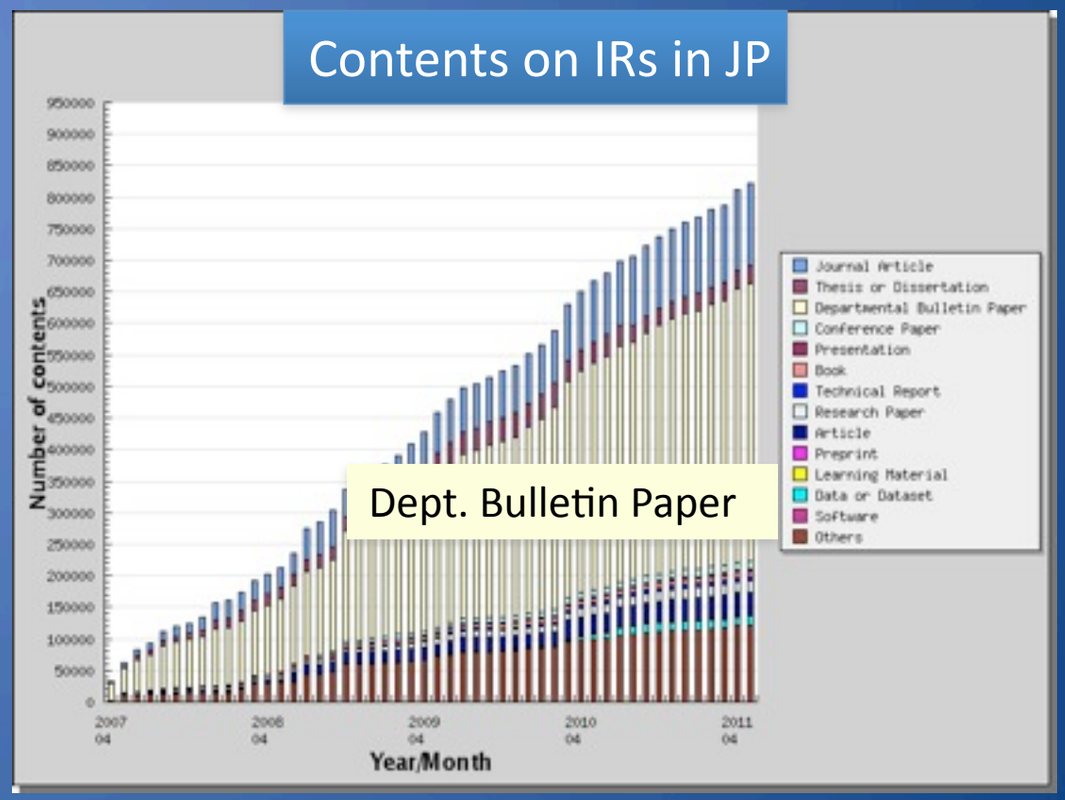
Approach to DML-JP

Overlay with institutional repositories in JP

–plus arxiv.org and Project Euclid

- #IRs in Japan is increasing.





- IRs provide platforms for *Dept. Bulletins*.

Some Difficulties

1. Identification
   - which PDF files on IRs are mathematical ones.
     - E.g., many dept. bulletins by *Faculty of Science*, including *non-mathematical papers*.
   - huge number of journal titles but nobody knows the list of full titles.
2. Poor metadata
   - metadata on IRs is insufficient from viewpoints of mathematics.

Solution

1. Identification: Matching with *MR number on MathSciNet*
   - *MathSciNet*: online version Math. Reviews
     + *reviews written by experts*
   - *Math. Reviews*: top tier journal by AMS
     - 200 titles and 70,000 articles indexed as Japanese ones.

2. Poor Metadata: Reviews in MathSciNet

```
IR Author: Maeda, Masao
IR Title: The four-or-more Vertex Theorems…
IR Official URL: http://hdl.handle.net/10131/1069
MR MSC Primary: 53A35, 53A, 53
MR Math. Reviews ID: 1710269
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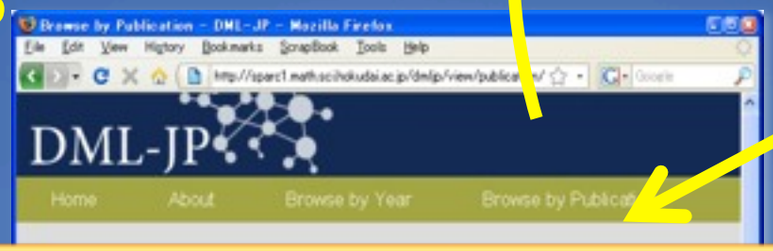
(MSC: Mathematics Subject Classifications)

In-Depth of DML-JP

http://sparc1.math.sci.hokudai.ac.jp/dmljp/

DML-JP



3. Merging metadata

68 of 200 journals, half of 70,000 articles

1. Metadata Harvesting

40 Institutional Repositories

2. Identifying Papers on IRs with MR number

4. SWORD and OAI-ORE

Math. Reviews/MathSciNet
2,000,000+ reviews

Conclusion

- DML-JP is a *disciplinary repository* cooperating with *institutional repositories*.
  - –*Institution*: digitization and providing accesses
  - –*Community*: feedback high quality metadata and lead readers to institutions

Future Work

- DML-JP requires new fields for IRs
  - –adding new field(s) means *new schema* of DBs behind repository systems.

Future work: Flexible repository systems