Dynamic management of digital rights for long-term preservation
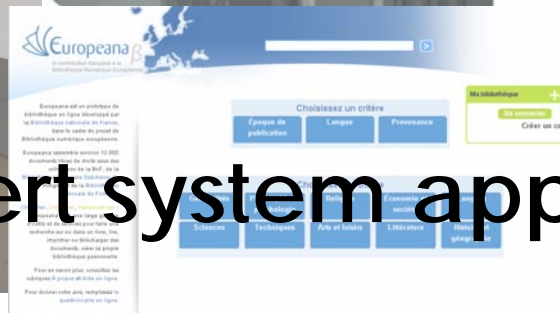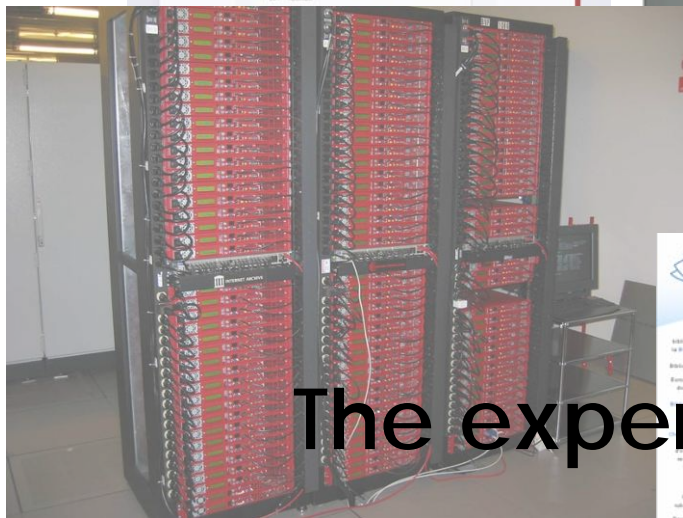
The expert system approach

Digital contents at BnF

- digitization programs
  - mass digitization for Gallica (open in 1997) and the European Digital Library (now 100 000 items per year)
  - digitization for preservation programs
- web archives
- administrative and technical documents produced by the library

SPAR
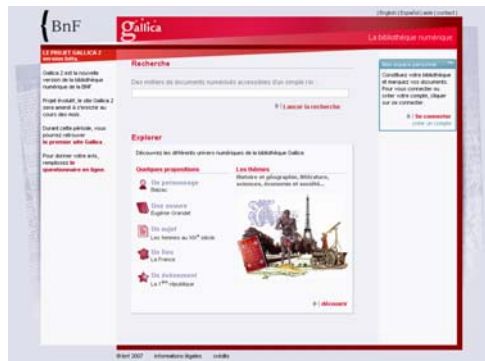
- « Système de Préservation et d'Archivage Réparti » (distributed system for preservation and archiving)
- **Hardware**
  - Sun StorageTek™ Disk (fast access) + tape Library (preservation)
  - Two storage sites
- **Software**
  - High level requirements
    - Full compliance to OAIS
    - Use of metadata standards : METS, PREMIS, DC, MIX, ODRL
    - Dimensioned up to1150 terabytes in 2010
    - Several workflows
  - currently in the procurement process

Digital rights issues

- digital content is very easy to obtain, duplicate, distribute, wihtout any loss in quality
- digital rights management, a way to control access and use
- long-term preservation involves managing changes over time in digital rights
- Static vs dynamic management
  - How to manage automatically
    - The access to works that enter the public domain ?
    - The end or changes in contracts between rights holders and the Library ?
- A solution may consist in developing a specific « expert system »

Different kinds of rights

- **Copyright law**
  - A work enters the public domain 70 years after the author's death
  - …

- **Legal deposit law**
  - Authorized access for accredited persons to digital versions of works entered by legal deposit (only inside the Library)

- **Privacy**
  - restricted access / special authorizations to access photographs representing identifiable persons
  - unpublished works (manuscripts, archives) under specific rules
  - …

- **Trademark and fair competition rules**

The expert system

- a computer program able to undertake and complete, whitin a specific field of knowledge, logical reasoning usually undertaken by humans

- Two mains components :
  - The **knowledge base**
    - Facts base
    - Rules base
  - The **inference engine**

The kwnoledge base

- **Facts Base**
  - Rights Metadata
    - One RM file associated to each digital object
  - Default use parameters
    - Defined for each Access Context, if no Contract
  - Contracts
    - Applicable to a specific set of digital objects
- **Rules Base**
  - Decision trees
- **New facts**
  - Licenses, the resulting file

Getting the Contract

Contract=yes

The user asks for a Digital Object

Calculating the **Access Statute**

A **License** is generated

Contract=no

Getting the **Default Use Parameters**

Applying the **Decision tree** On **Rights Metadata**

Example of Rights Metadata
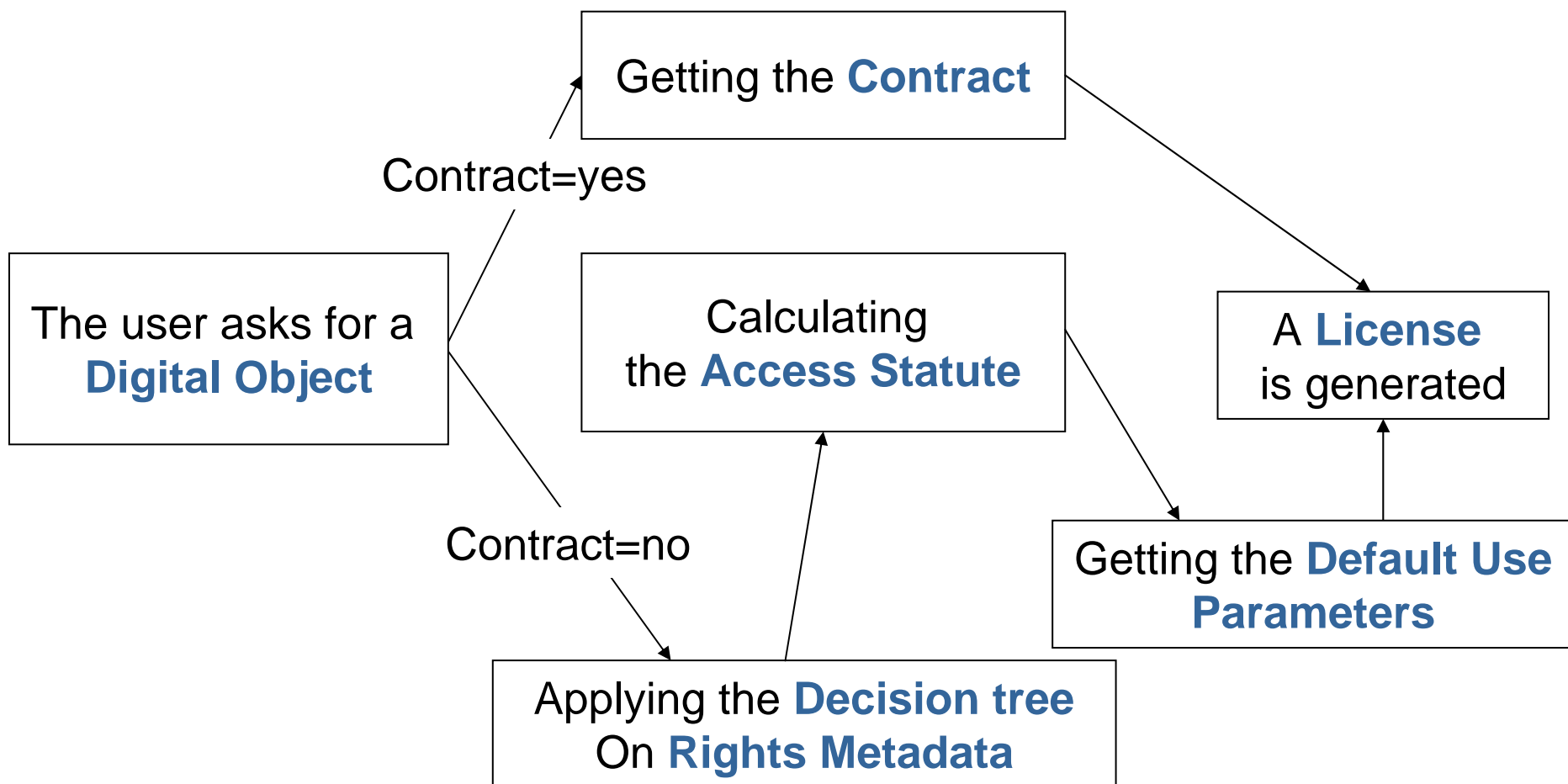
```xml
<?xml version="1.0" encoding="UTF-8"?>
<RightsMD>
    <Entity type="printed_text" level="group" EntityID="ark:/12148/bpt6k106131j/" EntityRecordID="FRBNF31126252">
        <contract statute="no"/>
        <monograph statute="yes"/>
        <periodical statute="no"/>
        <collectiveWork statute="no"/>
        <juridicalDecision statute="no"/>
        <entryMode>legal deposit</entryMode>
        <publicationDate statute="true">1875</publicationDate>
        <authority>
            <author deadForFrance="no" recordID="FRBNF119200941">
                <name>Poe, Edgar Allan</name>
                <deathDate>1849</deathDate>
                <role code="0070">author</role>
            </author>
            < author deadForFrance="no" recordID="FRBNF119141311">
                <name>Mallarmé, Stéphane</name>
                < deathDate>1898</ deathDate>
                <role code="0680">translator</role>
            </ author >
            < author deadForFrance ="no" recordID="FRBNF121059939">
                <name>Manet, Édouard</name>
                < deathDate>1883</ deathDate>
                <role code="0440">illustrator</role>
            </ author >
            <nonIdentifiedAuthor statute="no"/>
            <unknownDeathDate statute="no"/>
            <lastAuthorDeathDate>1898</lastAuthorDeathDate >
        </authority>
    </Entity>
</RightsMD>
```
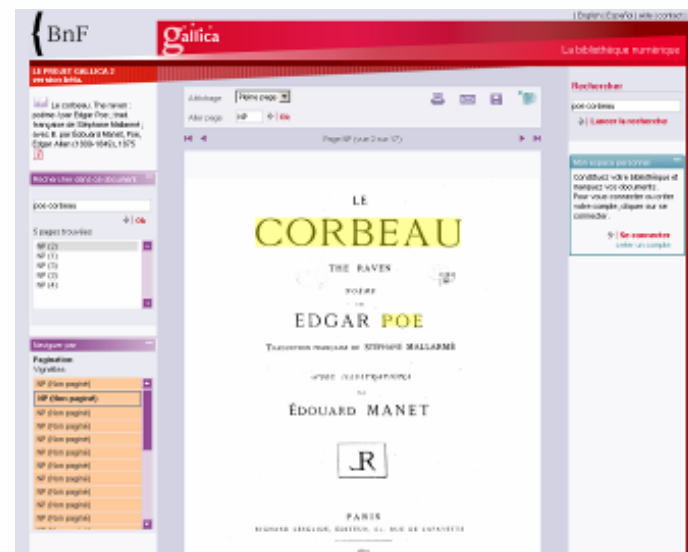
The decision trees

Defined following the type of documents, with respect to the French law

- Printed text
- Manuscripts
- Still images
- Moving images
- Sound recordings
- Software, databases
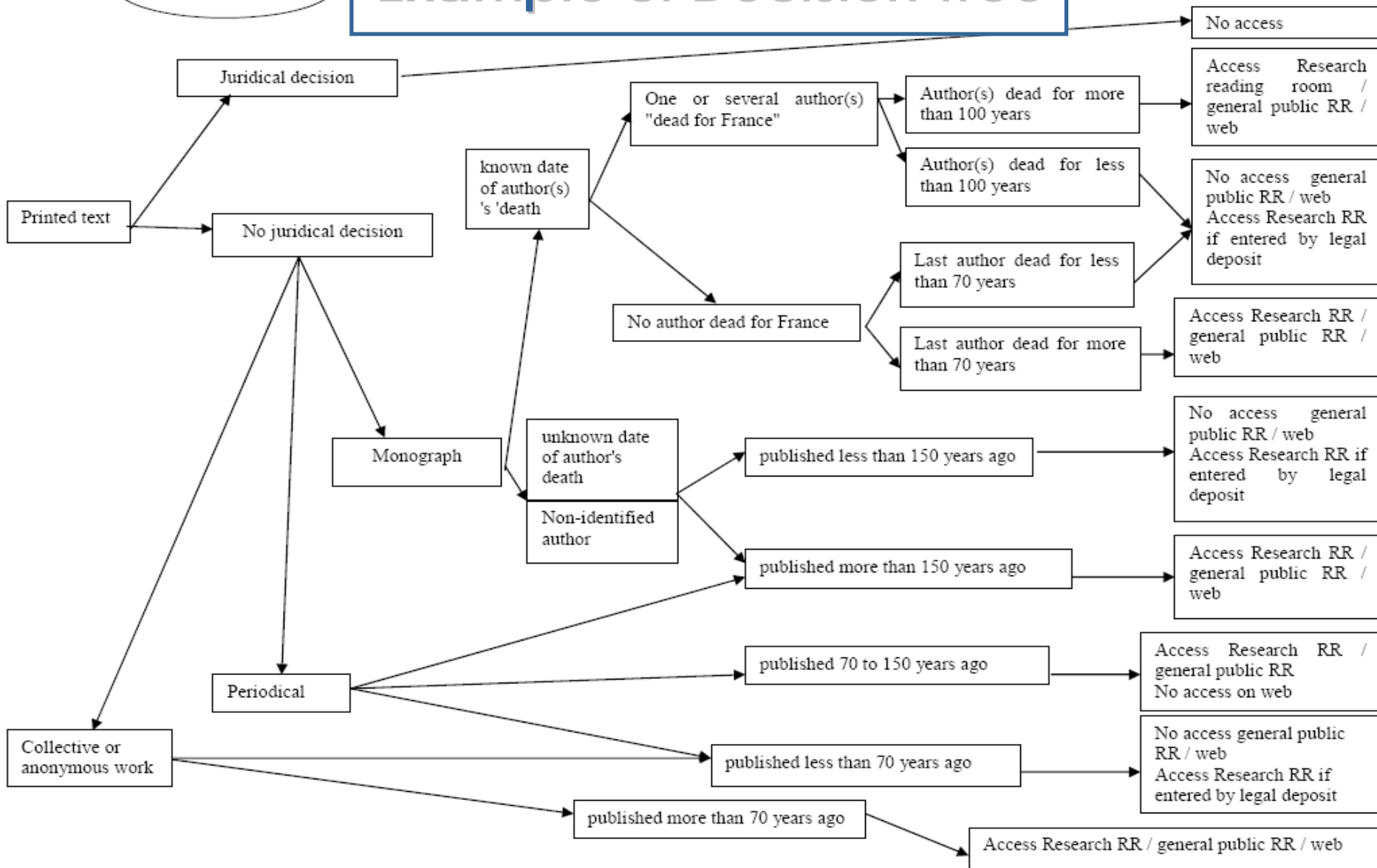- Administrative and technical documents produced by the library

BnF, Mandragore, Français 148, fol. 16v-17

Example of Decision Tree

"Access statutes"

Printed text

Juridical decision → No access

No juridical decision

known date of author(s)'s 'death

One or several author(s) "dead for France"

Author(s) dead for more than 100 years → Access Research reading room / general public RR / web

Author(s) dead for less than 100 years → No access general public RR / web Access Research RR if entered by legal deposit

No author dead for France

Last author dead for less than 70 years

Last author dead for more than 70 years → Access Research RR / general public RR / web

Monograph

unknown date of author's death

Non-identified author

published less than 150 years ago → No access general public RR / web Access Research RR if entered by legal deposit

published more than 150 years ago → Access Research RR / general public RR / web

Periodical

published 70 to 150 years ago → Access Research RR / general public RR No access on web

published less than 70 years ago → No access general public RR / web Access Research RR if entered by legal deposit

Collective or anonymous work

published more than 70 years ago → Access Research RR / general public RR / web

Access context & default use parameters

- **Access Contexts**
  - General public reading rooms
  - Restricted-access reading rooms (« research »)
  - Web users

  - …

- **Default Use Parameters**
  - Defined for each Access Context
  - Encoded using the ODRL standard

Default use parameters for web access

```xml
<?xml version="1.0" encoding="UTF-8"?>
<o-ex:rights xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns:enc="http://www.w3.org/2001/04/xmlenc#" xmlns:o-
dd="http://odrl.net/1.1/ODRL-DD" xmlns:o-ex="http://odrl.net/1.1/ODRL-EX"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://odrl.net/1.1/ODRL-DD http://odrl.net/1.1/ODRL-DD-
11.xsd">
    <o-ex:party>
        <o-ex:context>
            <o-dd:uid>urn:accessContext:web</o-dd:uid>
        </o-ex:context>
    </o-ex:party>
    <o-ex:permission>
        <o-dd:display>
            <o-ex:constraint>
                <o-dd:quality o-ex:type="resolution">
                    <o-ex:context>
                        <o-dd:uid>1024*1452</o-dd:uid>
                    </o-ex:context>
                </o-dd:quality>
            </o-ex:constraint>
        </o-dd:display>
        <o-dd:print/>
        <o-dd:save/>
    </o-ex:permission>
</o-ex:rights>
```

The License

- Using Access Status and Default Use parameters, the Rights Management Module generates a new file, called « License »

- This file contains all the actions that the end user can do on the document

- Encoded using the ODRL standard

```xml
<?xml version="1.0" encoding="UTF-8"?>
<o-ex:rights xmlns:ds="http://www.w3.org/2000/09/xmldsig#" xmlns:enc="http://www.w3.org/2001/04/xmlenc#" xmlns:o-dd="http://odrl.net/1.1/ODRL-DD" xmlns:o-ex="http://odrl.net/1.1/ODRL-EX" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://odrl.net/1.1/ODRL-DD http://odrl.net/1.1/ODRL-DD-11.xsd">
    <o-ex:agreement>
        <o-ex:context>
            <o-dd:uid>urn:license:20070425:ark:/12148/bpt6k213599h</o-dd:uid>
            <o-dd:pLocation>Bibliothèque nationale de France, Paris</o-dd:pLocation>
            <o-dd:remark>License generated by SPAR (BnF)</o-dd:remark>
        </o-ex:context>
        <o-ex:asset>
            <o-ex:context>
                <o-dd:uid>ark:/12148/bpt6k213599h</o-dd:uid>
            </o-ex:context>
        </o-ex:asset>
        <o-ex:permission>
            <o-ex:context>
                <o-dd:name>urn:accessContext:web</o-dd:name>
            </o-ex:context>
            <o-dd:display>
                <o-ex:constraint>
                    <o-dd:quality o-ex:type="resolution">
                        <o-ex:context>
                            <o-dd:uid>1024*1452</o-dd:uid>
                        </o-ex:context>
                    </o-dd:quality>
                </o-ex:constraint>
            </o-dd:display>
            <o-dd:print/>
            <o-dd:save/>
        </o-ex:permission>
        <o-ex:party>
            <o-ex:context>
                <o-dd:uid>urn:accessContext:web</o-dd:uid>
            </o-ex:context>
        </o-ex:party>
    </o-ex:agreement>
</o-ex:rights>
```
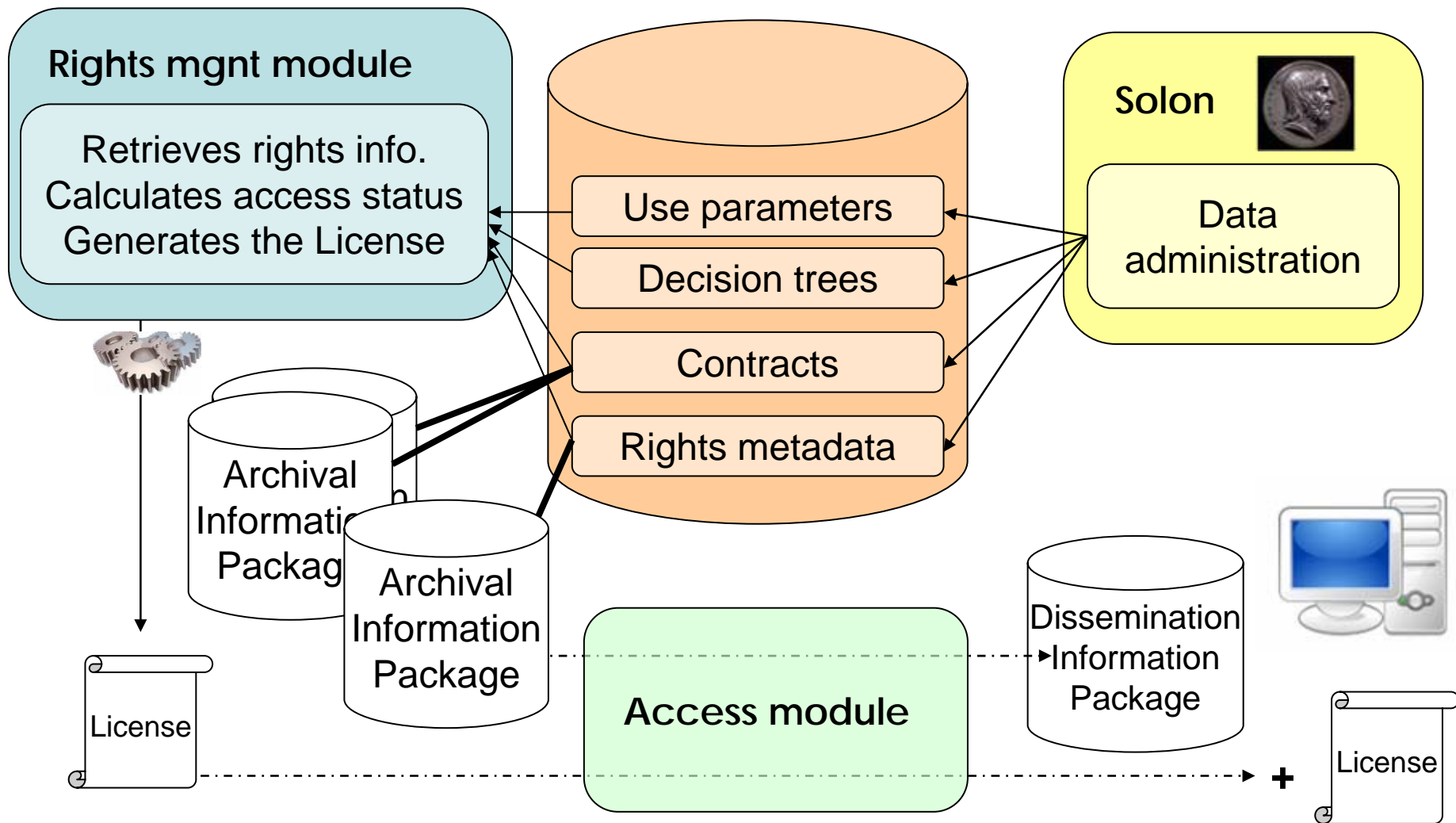
Example of License

Contract

- « Contracts » are specific files applicable to a predefined set of documents
  - **agreements** between rights holders and the Library to liberate access
- Encoded using the ODRL standard
- A Contract file contains both Access Status and Use Parameters

```xml
<?xml version="1.0" encoding="UTF-8"?>
<o-ex:rights xmlns:ds="http://www.w3.org/2000/09/xmldsig#" xmlns:enc="http://www.w3.org/2001/04/xmlenc#" xmlns:o-
dd="http://odrl.net/1.1/ODRL-DD" xmlns:o-ex="http://odrl.net/1.1/ODRL-EX"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://odrl.net/1.1/ODRL-DD
http://odrl.net/1.1/ODRL-DD-11.xsd">
    <o-ex:agreement>
        <o-ex:context>
            <o-dd:uid>urn:contract:1456852</o-dd:uid>
            <o-dd:pLocation>Bibliothèque nationale de France, Paris</o-dd:pLocation>
            <o-dd:remark>Contract n° 1456852 between BnF and  "société Delta photos"</o-dd:remark>
<o-dd:date><o-dd:fixed>2004-10-12</o-dd:fixed></o-dd:date>
        </o-ex:context>
        <o-ex:party>
            <o-ex:rightsholder>
                <o-ex:context>
                    <o-dd:uid>[ID of "Delta photos corporation"</o-dd:uid>
                    <o-dd:name>Delta photos</o-dd:name>
                    <o-dd:pLocation>[address of rights holder]</o-dd:pLocation>
                    <o-dd:role>[role of the rights holder]</o-dd:role>
                </o-ex:context>
            </o-ex:rightsholder>
        </o-ex:party>
        <o-ex:permission>
            <o-ex:constraint>
                <o-dd:datetime>
                    <o-dd:start>2005-01-01T00:00:00</o-dd:start>
                    <o-dd:end>2011-12-31T23:59:59</o-dd:end>
                </o-dd:datetime>
            </o-ex:constraint>
            <o-ex:context>
                <o-dd:name>urn:accessContext:Research</o-dd:name>
            </o-ex:context>
            <o-dd:display/>
        </o-ex:permission>
        <o-ex:permission>
            <o-ex:constraint>
                <o-dd:datetime>
                    <o-dd:start>2005-01-01T00:00:00</o-dd:start>
                    <o-dd:end>2011-12-31T23:59:59</o-dd:end>
                </o-dd:datetime>
            </o-ex:constraint>
            <o-ex:context>
                <o-dd:uid>urn:accessContext:generalPublic</o-dd:uid>
            </o-ex:context>
            <o-dd:display/>
        </o-ex:permission>
    </o-ex:agreement>
</o-ex:rights>
```

Example of Contract (fictive)

Rights management in SPAR

Rights mgnt module

Retrieves rights info.
Calculates access status
Generates the License

Solon

Data administration

Use parameters

Decision trees

Contracts

Rights metadata

Archival Information Package

Archival Information Package

License

Dissemination Information Package

Access module

License

Conclusion

- Strong difference between
  - « rights metadata » (descriptive metadata,)
  - and « License » (permissions) => possible interoperability
- Tight collaboration between
  - Juridical experts
  - Digital preservation experts
  - Collections managers
  - Information system engineers

Some useful studies…

- Rights in the PREMIS Data Model, A Report for the Library of Congress, Karen Coyle, December 2006
  - http://www.loc.gov/standards/premis/Rights-in-the-PREMIS-Data-Model.pdf

- Digital rights and asset management: access and preservation forum by the Digital Preservation Coalition, October 2006
  - http://www.dpconline.org/graphics/events/0610dramforum.html

- The Management of Rights in the Digital Environment: Lessons from Legal A.I., Alan Cunningham, 18th BILETA conference, April 2003
  - http://www.bileta.ac.uk/Document%20Library/1/The%20Management%20of%20Rights%20in%20the%20Digital%20Environment%20-%20Lessons%20from%20Legal%20A.I.pdf