

**TW LOM:**  
*an Application Profile Approach*

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# Outline

- TW LOM
  - Methodology
  - Outcomes
- TW LOM Application
  - A Case Study of Cultural Affairs School of E-learning
  - From Learning Object Metadata to Content Package
- Conclusion and Ongoing Work
  - Toward Depth in the Metadata Application Profile

TW LOM

# What is TW LOM ?

- TW LOM
  - Taiwan Learning Object Metadata Standard
- Learning Object Metadata (IEEE 1484.12.1-2002 LOM v1.0)
  - An important international metadata standard for describing Learning Objects.
  - When applying LOM standard, different countries would have different requests. To reach the localization needs and interoperability of learning objects, many countries would adopt the Application Profile approach, such as:
    - U.S.- SCORM
    - Canada- CanCore
    - United Kingdom- UK LOM Core
    - Taiwan- TW LOM
- Contributors :
  - National Digital Archives Program
  - National Science and Technology Program for e-Learning
  - Ministry of Education . Academia Sinica . Institute for Information Industry . National Taiwan Normal University

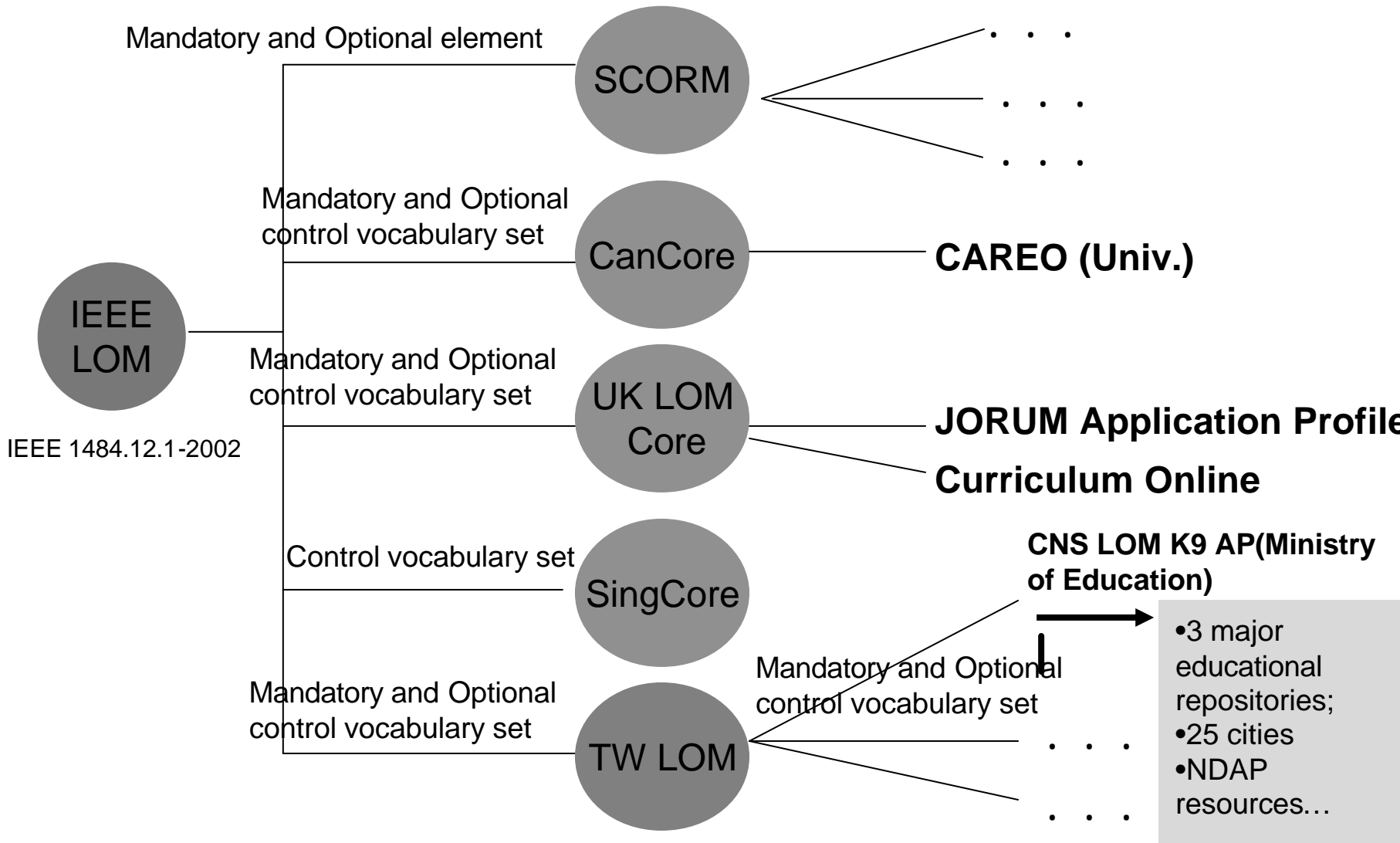
# What is TW LOM?

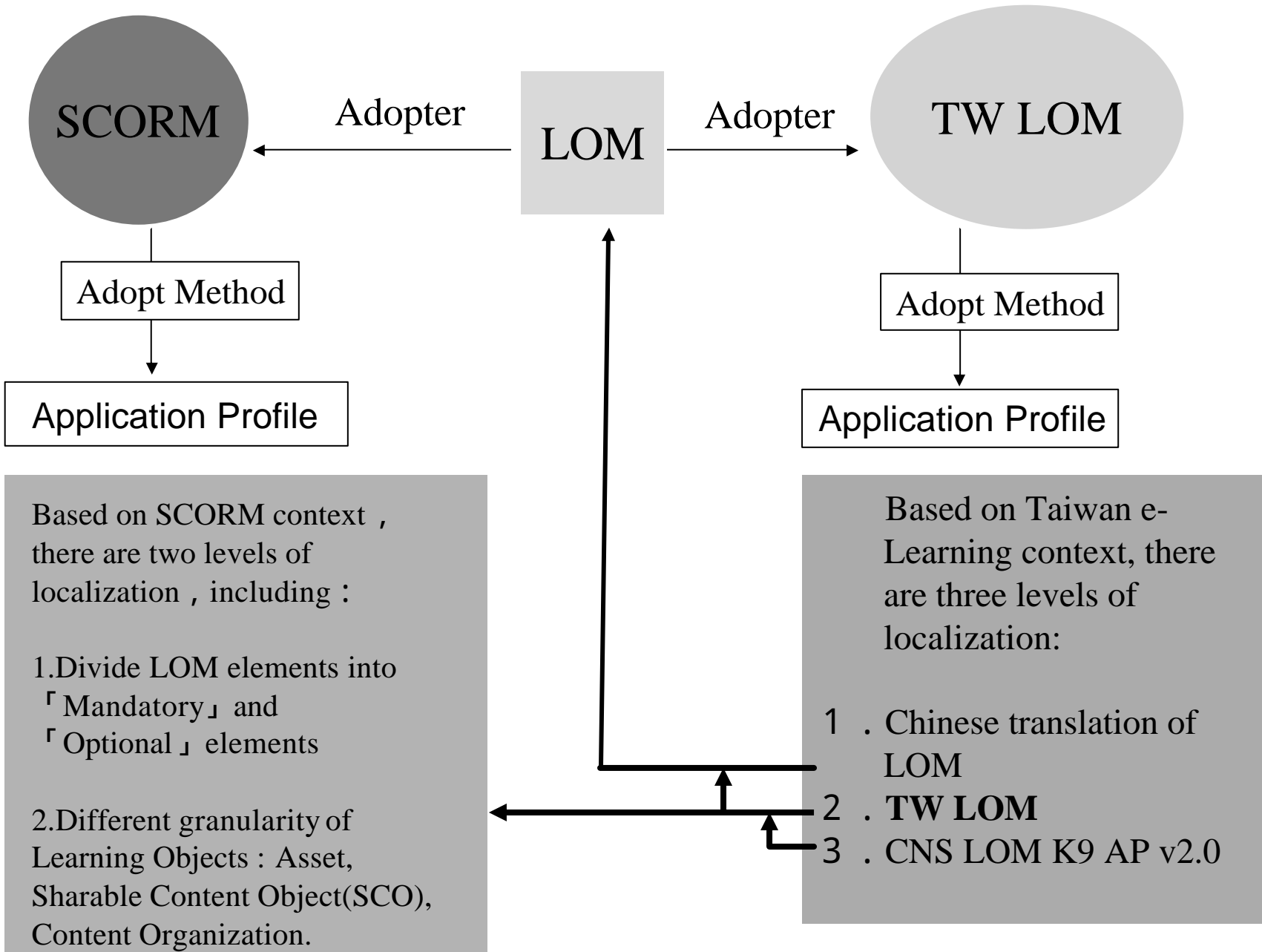
- Development of TW LOM
  - Two Goals (1) Interoperability internationally  
(2) Localization in Taiwan
  - Based on Ministry of Education, Education to e-Learning project (EtoE)
  - Under the TW LOM standard, different communities, such as: K12 or Advanced Education, can establish their own application profiles.

# Research Methodology

- The Approach: LOMAP
  - Learning Object Metadata Application Profile
  - Application Profile
    - A set of metadata elements, policies, and guidelines defined for a particular application.
    - The elements may be from one or more element sets, thus allowing a given application to meet its functional requirements by using metadata from several element sets including locally defined sets.
    - An Application profile is not complete without documentation that defines the policies and best practices appropriate to.

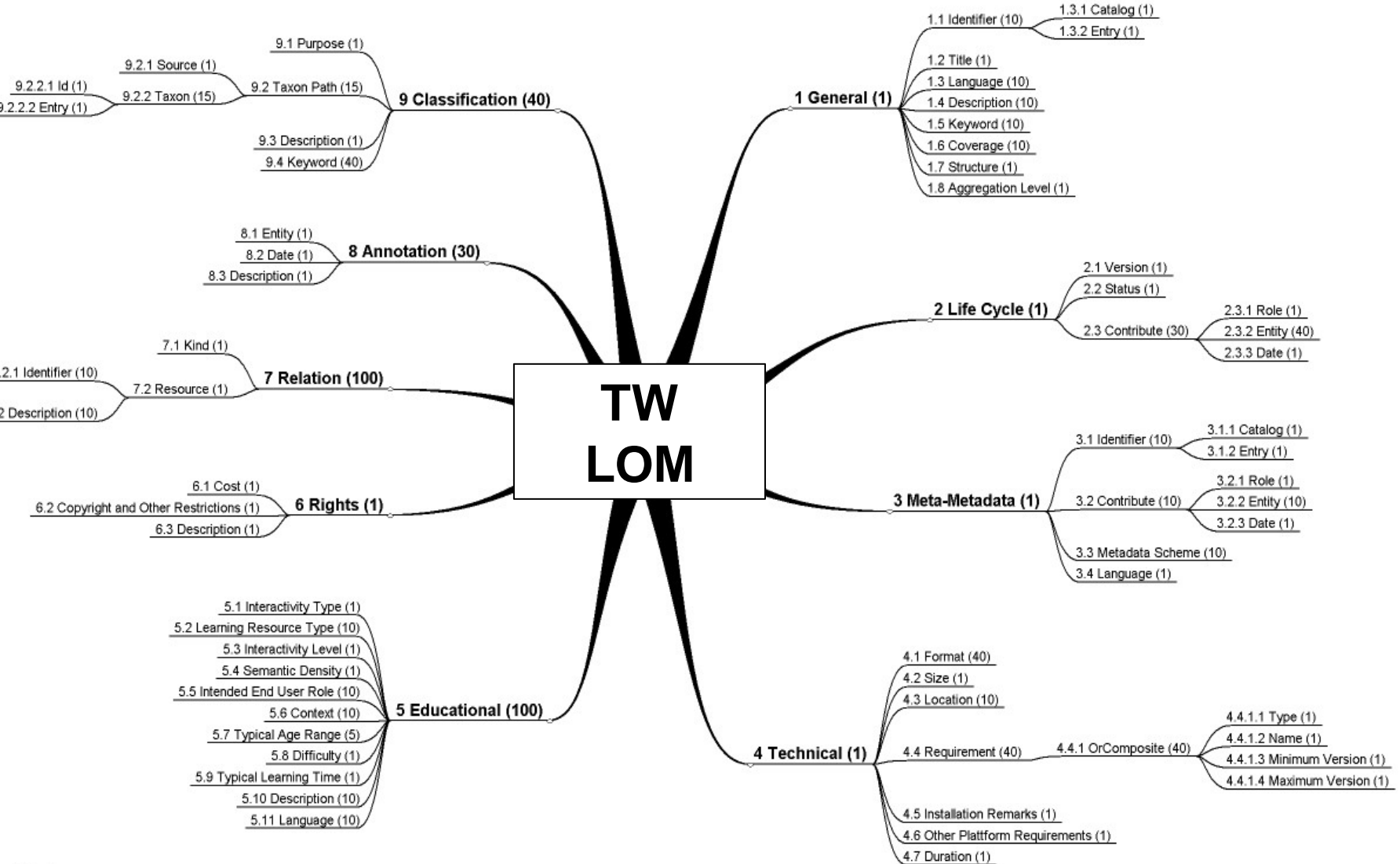
# Standard and Localization Application Profile (AP)







# TW LOM Structure



Same with LOM Structure

# TW LOM 9 Categories

1. General
2. Life cycle
3. Meta- metadata
4. Technical
5. Educational
6. Right
7. Relation
8. Annotation
9. Classification

# TWLLOM

Number	Element	Granularity of LOs		
		CA	SCO	Asset
1	General	Optional	Mandatory	M
1.1	Identifier	O	M	M
1.1.1	Catalog	O	O	O
1.1.2	Entry	O	M	M
1.2	Title	O	M	M
1.3	Language	O	O	O
1.4	Description	O	M	M
1.5	Keyword	O	M	O
1.6	Coverage	O	O	O
1.7	Structure	O	O	O
1.8	Aggregation Level	O	O	O

# TWLLOM

Number	Element	Granularity of LOs		
		CA	SCO	Asset
2	Life Cycle	O	M	O
2.1	Version	O	M	O
2.2	Status	O	M	O
2.3	Contribute	O	O	O
2.3.1	Role	O	O	O
2.3.2	Entity	O	O	O
2.3.3	Date	O	O	O

# TWLLOM

Number	Element	Granularity of LOs		
		CA	SCO	Asset
3	Meta-Metadata	M	M	M
3.1	Identifier	O	M	M
3.1.1	Catalog	O	O	O
3.1.2	Entry	O	M	M
3.2	Contribute	O	O	O
3.2.1	Role	O	O	O
3.2.2	Entity	O	O	O
3.2.3	Date	O	O	O
3.3	Metadata Schema	M	M	M
3.4	Language	O	O	O

# TWLLOM

Number	Element	Granularity of LOs		
		CA	SCO	Asset
4	Technical	O	M	M
4.1	Format	O	M	M
4.2	Size	O	O	O
4.3	Location	O	O	O
4.4	Requirement	O	O	O
4.4.1	OrComposite	O	O	O
4.4.1.1	Type	O	O	O
4.4.1.2	Name	O	O	O
4.4.1.3	Minimum Version	O	O	O
4.4.1.4	Maximum Version	O	O	O
4.5	Installation Remarks	O	O	O
4.6	Other Platform Requirements	O	O	O
4.7	Duration	O	O	O

# TWLLOM

Number	Element	Granularity of LOs		
		CA	SCO	Asset
5	Educational	O	O	O
5.1	Interactivity Type	O	O	O
5.2	Learning Resource Type	O	O	O
5.3	Interactivity Level	O	O	O
5.4	Semantic Density	O	O	O
5.5	Intended End User Role	O	O	O
5.6	Context	O	O	O
5.7	Typical Age Range	O	O	O
5.8	Difficulty	O	O	O
5.9	Typical Learning Time	O	O	O
5.10	Description	O	O	O
5.11	Language	O	O	O

# TW LOM Milestone

- Draft and the First Hearing(2005-07-04)
- Applying for national standard (CNS, 2006-01 still processing...)
- Show Case and Best Practices of TW LOMA in public sectors
  - Cultural Affairs(2006-09-29)



# **TW LOM Application**

## **A Case Study of**

Cultural Affairs, School of E- learning  
(CASP)

# http://case.cca.gov.tw/case5/

The screenshot shows a web browser window displaying the Case5 website. The browser's address bar shows the URL `case.cca.gov.tw/`. The website has a dark theme with a sidebar on the left and a main content area on the right.

**Browser Window:**

- Address bar: `case.cca.gov.tw/`
- Navigation buttons: Back, Forward, Home, Stop, Reload
- Search engines: Google, 歌詞搜尋
- Language: WEB, BBS
- Page title: 文建會網路學院

**Website Navigation (Left Sidebar):**

- 網路學院部落格 BLOG
- 學院資訊 INFORMATION
- 活動中心 ACTIVITIES
- 客服櫃檯 SERVICE
  - ◆ 教務須知
  - ◆ 平台操作
  - ◆ 客服信箱
- 回到首頁 HOME
- USERNAME: [input] 登入學院
- PASSWORD: [input] 忘記密碼
- COUNTER: 805498 加入會員

**Main Content Area:**

- Header: 5th CASE Cultural Affairs, School of E-learning 文建會網路學院
- 最新活動 (Latest Activities) [最新電子報]
- BLOG 獎十萬**
- 「部落格達人」募集大賽來囉！**
- 只要你是文建會網路學院的學員，統統可以來參加！獎金十萬等你拿！
- 什麼是Blog? 誰是Blog? Blog是文建會網路學院的新成員，Blog是你、我的個人專區，在文建會網路學院的Blog中你可以盡情暢所欲言，張貼搞怪、藝術、人文等等各式各樣圖片，刊登您的得意作品，與所有朋友分享經驗，資訊交流，介紹網站等。 [read more](#)
- CASE公告 (CASE Announcements) [MORE]
- 2006/7/31 網路學院主機維護公告
- 2006/7/28 網路學院停機公告(含部落格)
- 2006/7/24 國立傳統藝術中心網路數位學院熱烈招生中，相招CASE學員一起參加！
- 2006/5/11 文建會網路學院(含部落格)已維護完畢
- 2006/5/11 test
- 線上知識庫 (Online Knowledge Base) [MORE]

**Taskbar (Bottom):**

- Taskbar icons: 開始, 網路, 文建會網路..., 能力越強, MSN Messenger, Victoria~調...
- System tray: 上午 09:48

# Course structure

8series, 38courses

城汝菁 @ iCAN xp - Microsoft Internet Explorer

檔案(E) 編輯(E) 檢視(V) 我的最愛(A) 工具(T) 說明(H)

← 上一頁 → 我的最愛 媒體

網址(D) http://case.cca.gov.tw/icanxp/ican\_frm.asp

---

**my School**

城汝菁 @ 個人教室 退出 / Exit 線上人數: 2

**首頁 Home**

- 個人服務
  - 我的課程
  - 我的問卷
  - 行事曆
  - 網路硬碟
  - 個人設定
- 公共廣場
  - 公告看板
  - 開課資訊
  - 公共討論區
  - 意見信箱
  - 使用手冊

**September 2006**

S	M	T	W	Th	F	S
27	28	29	30	31	1	2
▶ 3	4	5	6	7	8	9
▶ 10	11	12	13	14	15	16
▶ 17	18	19	20	21	22	23
▶ 24	25	26	27	28	29	30

**城汝菁@Dashboard**

上站次數: 92次  
 前次時間: 2006/9/26 下午 04:59:46  
 前次 IP: 140.122.104.62  
 心得討論: 0篇  
 我的訊息: 0 未讀取  
 我的問卷: 份未填寫

**文大校園公告**

- 網路學院主機維運公告...
- 網路學院停機公告(含...
- 國立傳統藝術中心網路...
- 文建會網路學院(含部...
- test...

more

**Notices :**

- 注意事項: 如在使用上有問題, 請參考本文件。

**我的課程** 未讀取筆數

課程名稱	公告	教材	心得
<b>文化資產系列</b>			
☺ 文化資產聽、看、停 <b>HOT!</b>	0	0	0
<b>公民美學系列</b>			
☺ 從公民權的演化談文化公民權 <b>HOT!</b>	0	0	193
☺ 環境視覺設計概論 <b>HOT!</b>	0	0	78
☺ 公民美學與社會教育之未來展望 <b>HOT!</b>	0	0	72
☺ 公民美學的基礎建構 <b>HOT!</b>	0	0	70
☺ 公民美學的自然享受與創造 <b>HOT!</b>	0	0	58

完成

開始 | ptt.cc | fchung... | en (此... | 文建會... | 文建會... | 城汝菁... | CH 上午 10:37

# 8 series, 38 courses

- Civic Aesthetics Series
  - 16 courses
- Cultural Policy Series
  - 2 courses
- Community Culture Foundation Series
  - 4 courses
- Community Culture Advanced Series
  - 4 courses
- Online Culture Development Plan Series
  - 1 course
- Cultural Creative Industry Series
  - 5 courses
- Taiwan Culture Series
  - 12 courses
- Regional Culture Series
  - 4 courses

# TWLOM Implementation Methodology

- A. Choose the samples
- B. Analyze and decompose the granularity of courses
- C. Guide to the Metadata Implementation
- D. Import Metadata into Content Package

# Regional Culture Series :

## Tainan Digital Artifact - by Flash

### 水彩兒童教室

- 第一章 水與色彩鬥陣走
  - 第一節 水彩畫的特質
  - 第二節 材料與工具
- 第二章 水彩創作花落米
- 第三章 水彩欣賞扛八袋
- 第四章 水彩遊戲超炫風

水彩兒童教室

課程資訊 課程架構 參考資料 藝文小字典 常見問題 使用手冊

水彩畫的特質

頁數 1 2 3 4

Close Outline

第一節 水彩畫的特質

# Decompose the granularity of courses

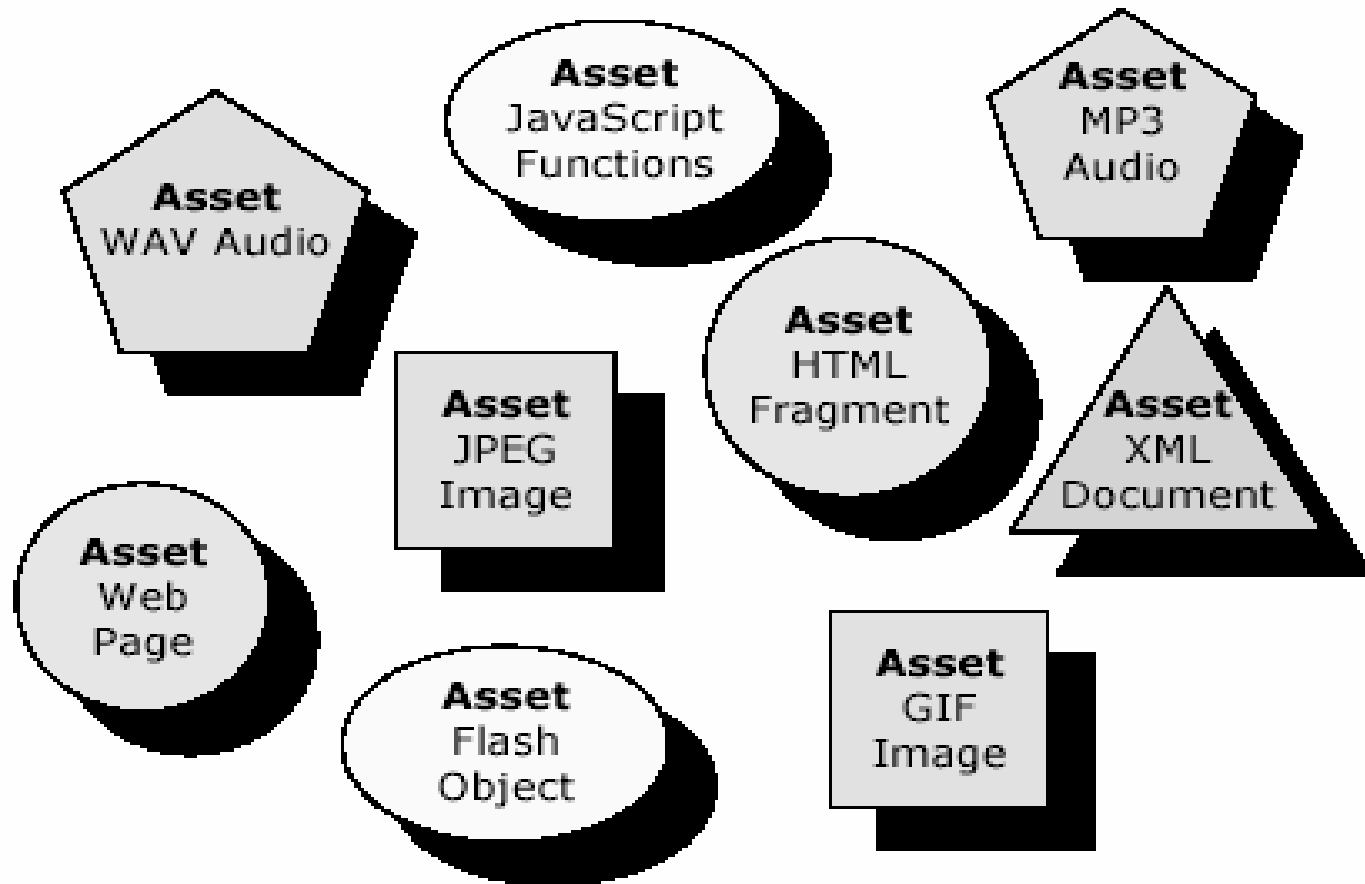
- Study three layers of TWLOM
- Observing the online course
- Analysis the course by it's content and characteristic, and decompose the course into different learning objects granularities
- Based on SCROM 2004 standard, the granularity of learning object is divided into
  - Asset
  - SCO (Sharable Content Object)
  - CA (Content Aggregation )

# Decompose principle

- Learning object : it can be use independently in any learning environment
- Learning object is flexible and has multi-layers ,eg. several small SCOs can be grouped in a big SCO, and several big SCOs can be grouped in a bigger SCO
- Learning object can be decomposed into three layers or more. It is decided by the requirement of time and labor cost of the institution.



# SCORM Content Model Components- Asset



•From ADL SCORM CAM 1.3

# Asset example

書法篆刻進階教室

- 第一章 書法篆刻發展史
- 第二章 書法篆刻技法的解析及製作
  - 第一節 書法的自學與創作
  - 第二節 篆刻的臨摹與創作
- 第三章 收藏入門

書篆 進階

課程資訊 課程架構 參考資料 藝文小字典 常見問題 使用手冊

### 第三章 收藏入門

#### 書法收藏保存密技

3. 購買來之前已裝裱完成，就需要注意溫濕度與光線的問題。

捲軸 (手卷)

木框

下載 書法收藏保存密技

audio

Narrative text

graph

Close Outline 第三章 收藏入門

# Asset example

網址 (D) C:\台南南瀛\write3\content\書法收藏保存密技.doc

Y! Search Web Upgrade Now! Mail My Y

書法收藏保存密技.doc + Add Tab

顯示完稿變異 顯示(S) ab

1 6 | 1 4 | 1 2 | 1 2 | 1 4 | 1 6 | 1 8 | 1 10 | 1 12 | 1 14 | 1 16 | 1 18 | 1 20 | 1 22 | 1 24 | 1 26 | 1 28 | 1 30 | 1 32 | 1 34 | 1 36 | 1 38 | 1 40 | 1 42

1 1 2 3 1 4  
1 1 2 1 1  
1 3 1 4  
1 5  
1 6  
1 7  
1 8  
1 9  
1 10  
1 11  
1 12  
1 13  
1 14  
1 15  
1 16

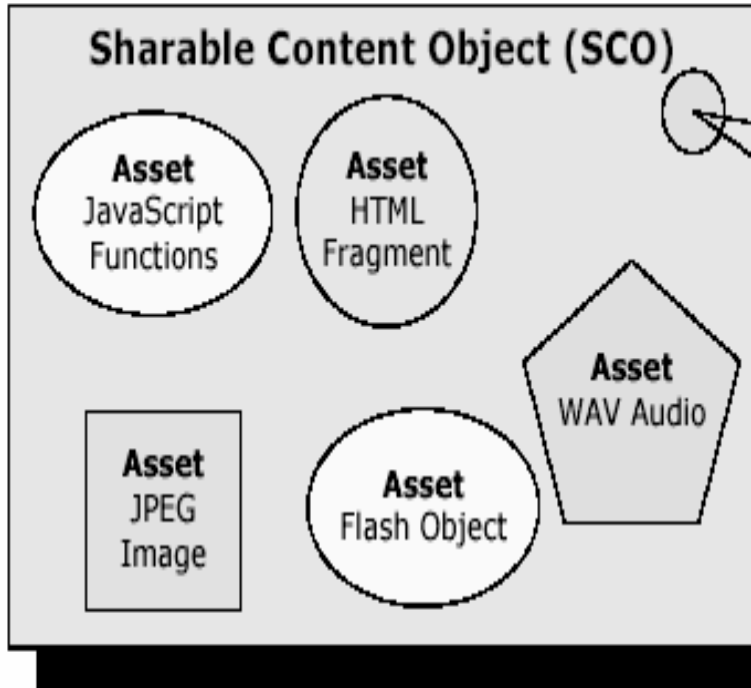
## 書法收藏保存密技

1. → 一般書法以捲軸（手卷）、木框最為常見，作品取得之後最好能找注重糊、命紙的裝裱師裝裱，對作品保存能維持比較久。
2. → 購買來之前已裝裱完成，就需要注意溫濕度與光線的問題。
3. → 掛軸：
  - (1) 季節乾爽之際懸掛。
  - (2) 收納時注意灰塵清潔，捲起宜鬆緊適度。
  - (3) 可收於塑膠袋再置入梧桐木盒中，內置防蟲劑（忌用樟腦丸）。
  - (4) 可保持恆溫、恆濕並防光。

不明的區域

# SCORM Content Model

## Components- SCO



SCOs must Initialize and Terminate communication with an LMS. The list below details the SCO provided functionality:

- Find the LMS Provided API Instance
- Use the API Instance to Initialize SCO Communication with the LMS
- Optionally use the API Instance to Get and Set Values
- Use the API Instance to Terminate Communication with the LMS

•From ADL SCORM CAM 1.3

# SCO example

台南南瀛數位文物 地方文化系列 -- CA0703 LINK

上課 大綱 教材 討論 公告 歷程

台南縣政府文化局  
南瀛數位文物學習網

兒童教室

- 水彩
- 國畫
- 書法篆刻
- 素人畫家洪通

一般教室

- 水彩
- 國畫
- 書法篆刻
- 素人畫家洪通

進階教室

- 水彩
- 國畫
- 書法篆刻
- 素人畫家洪通

My School

© ICAN 3.0 文化大學 29

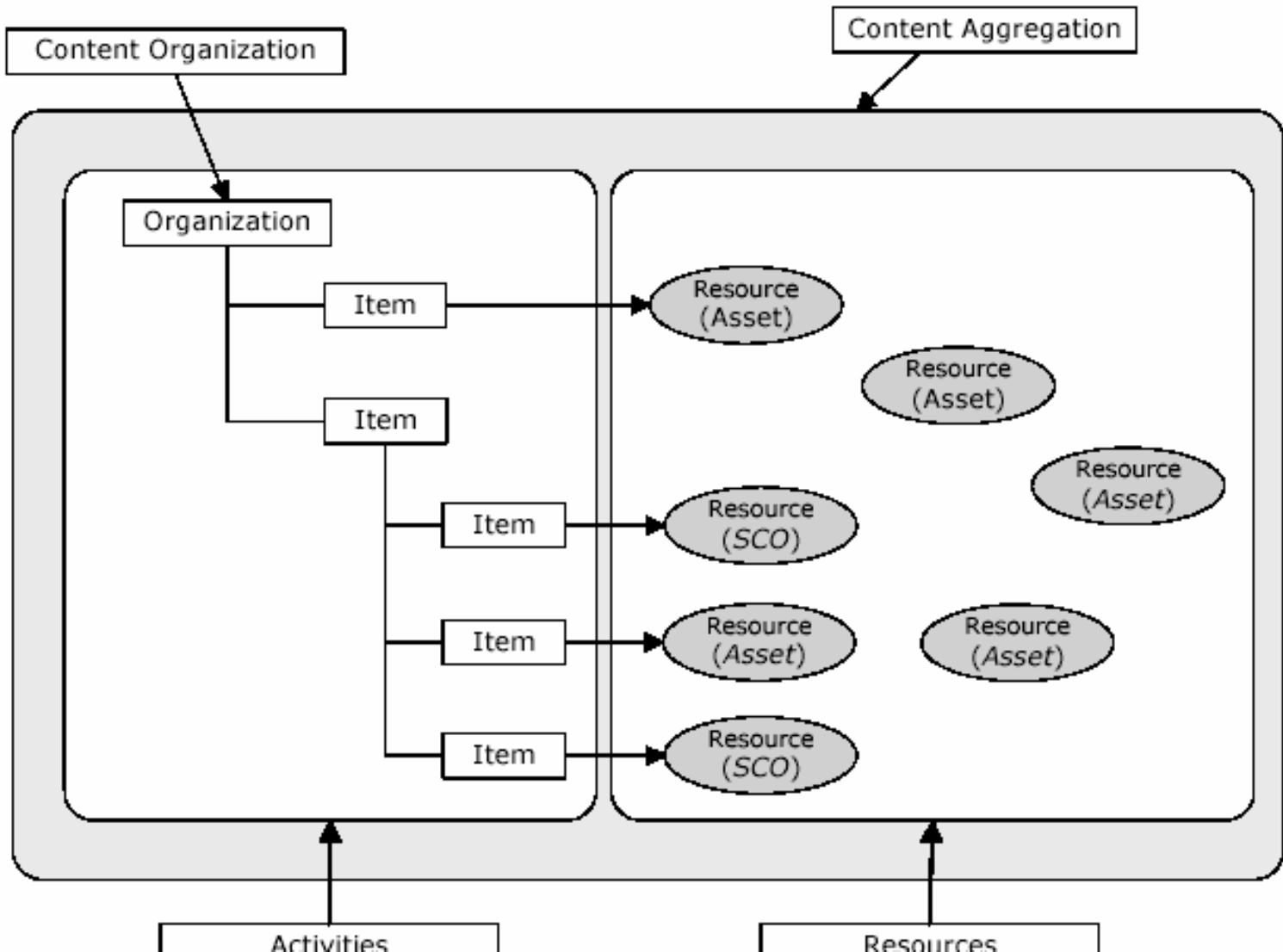
# SCORM Content Model Components

## – Content Aggregation

- Content Aggregation include the sequence of SCOs, relations among SCOs, all the physical files in Content Aggregation...etc.
- For the consideration of reusability, a learning design must contain the order and organization information of assets, SCOs and activities, and aggregate them into a package, with a standard transfer protocol, to achieve the interoperability between learning object repositories and learning management systems.
  - Ex : Use IMS Content Package Specification to Package a learning Design

# SCORM Content Model Components

## – Content Aggregation



# Course structure

Regional Culture Series (CA)



Tainan Digital Artifact (**big SCO**)

Children class  
(**Middle SCO**)

Watercolor

Traditional  
Chinese painting

Calligraphy and  
seal cutting

Artist: Hong Tong

General class  
(**Middle SCO**)

(**Small SCO**)

Watercolor

Traditional  
Chinese painting

Calligraphy and  
seal cutting

Artist: Hong Tong

Advanced class  
(**Middle SCO**)

(**Small SCO**)

Watercolor – text

Traditional Chinese painting – text  
(**Asset**)

Calligraphy and seal cutting – text  
(**Asset**)

Artist: Hong Tong 32



# Guide to the Metadata Implementation

5.2 Learning Resource Type				
Definition	Specific kind of learning object. The most dominant kind shall be first.			
Obligation & Size		CA	SCO	Asset
	obligation	Optional	Recommendation	Recommendation
	Size	10	10	10
Order	ordered			
Value space	Exercise ~ simulation ~ questionnaire ~ diagram ~ figure ~ graph ~ index ~ slide ~ table ~ narrative text ~ exam ~ experiment ~ problem statement ~ self assessment ~ lecture			
Data type	Vocabulary(state)			
Catalogue rule	The element can be repeat for 10 times. When you cataloging this element, the system will display all the value space of CNS-LOM : Exercise ~ simulation ~ questionnaire ~ diagram ~ figure ~ graph ~ index ~ slide ~ table ~ narrative text ~ exam ~ experiment ~ problem statement ~ self assessment ~ lecture			
System Recommendation	When you cataloging this element, system will display the menu : Exercise ~ simulation ~ questionnaire ~ diagram ~ figure ~ graph ~ index ~ slide ~ table ~ narrative text ~ exam ~ experiment ~ problem statement ~ self assessment ~ lecture, provide cataloger to select.			
Example	<ul style="list-style-type: none"> <li>● → graph..</li> <li>● → slide..</li> </ul>			

# Element rules of different layers

	TWLOM		CASP		
	Mandatory	Optional	Mandatory	Recommendation	Optional
CA	1	57	1	12	45
SCO	11	47	11	8	39
Asset	8	50	8	9	41

# RELOAD Editor(1/2)

- Reusable e-Learning Object Authoring and Delivery (RELOAD) is a JISC funded project developing tools to facilitate the use of emerging Learning Technology Interoperability specifications such as those produced by ADL and IMS
- The RELOAD Editor is a Content Packager and Metadata editor.
- We use the latest Beta version RELOAD 2.5 which support IEEE LOM and SCORM 2004
  - Reason : TW LOM was developed base on IEEE LOM and SCORM 2004

# RELOAD Editor(2/2)

- Pros:
  - Available at no charge
  - Open Source
  - Support IEEE LOM and many other APs
  - Customizable
- Cons:
  - It uses jargon taken directly from the standard and may require someone with cataloguing expertise to use it
  - It structures the data in the linear order used in the standard and implies a linear entry

# RELOAD Metadata Editor

Metadata - D:\E-learning\TWCORE\TWLOM\文建會課程4&5\課程4&5\CA.xml

Profile: IMS LRM Profile

Form View | Tree View | Full Form View

Right-Click on the element for further options | Click on the left arrow to collapse/view details |  Add Profile Elements

### Metadata

- General
  - Identifier
    - Catalog: 文建會網路學院識別碼
    - Entry: caseCA00000000
  - Title
    - string: 地方文化系列
  - Description
    - string: 本系列包含四個課程：1.光和影-紙影偶的製作與演出 2.補光抓影話影偶 3.台南南瀛數
- lifeCycle
- metaMetadata
  - Contribution
  - Contribution
    - metadataSchema: CNS LOM文建會AP
    - metadataSchema: CNS LOM
    - metadataSchema: LOMv1.0
    - metadataSchema: SCORM\_CAM\_v1.3
- Rights
  - Cost
    - Source: LOMv1.0
    - Value: no
  - copyrightAndOtherRestrictions
    - Source: LOMv1.0
    - Value: yes
  - Description
    - string: 創用 CC 姓名標示-非商業性-禁止改作 2.5 台灣 授權條款

Attribute	Value
.language	zh-TW

# XML Metadata Example

```
<?xml version="1.0" encoding="UTF-8"?>
<lom xmlns="http://ltsc.ieee.org/xsd/LOM"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://ltsc.ieee.org/xsd/LOM lom.xsd">
  <general>
    <identifier>
      <catalog>文建會網路學院識別碼</catalog>
      <entry>caseSC00000034</entry>
    </identifier>
    <title>
      <string language="zh-TW">水彩</string>
    </title>
    .....(中略)
    <description>
      <string>創用CC 姓名標示-非商業性-相同方式分享 2.5 台灣 授權條款</string>
    </description>
  </rights>
</lom>
```

# Example SCO

<b>Title</b>	水彩 (Watercolor)
<b>Description</b>	使學習者可瞭解水彩的特質，並認識水彩的工具與材料、基本的水彩畫技法與如何鑑賞水彩畫。(Learners can understand the features of watercolor paintings, and also know how to appreciate them.)
<b>Keyword</b>	水彩創作; 水彩欣賞 (Creation of watercolor; Appreciation of watercolor)
<b>Contributor</b>	作者: 陳甲上 (Author: Chia-shang Chen)
<b>Format</b>	text/html
<b>Learning Resource Type</b>	演講 (Lecture)
<b>Cost</b>	No
<b>Right-Description</b>	創用CC 姓名標示-非商業性-相同方式分享 2.5 台灣 授權條款 (CC Attribution-Noncommercial-Share Alike)

# RELOAD Content Packager

The screenshot displays the RELOAD Editor application window. The title bar reads "Reload Editor". The menu bar includes "File", "Edit", "Tools", "View", "Window", and "Help". The toolbar contains various icons for file operations and editing. The main workspace is titled "SCORM 2004 Package - nanyang2004".

The left pane shows a "Files" view with a tree structure of the package contents, including folders like "content", "images", "sounds", and "resources", and files like "adlscorm1.xml", "adlscorm2.xml", etc.

The right pane shows a "Content Package" view with a tree structure of the package metadata. The selected element is "Organization", which is highlighted in blue. Below the tree, there is a table with the following data:

Attribute	Value
Identifier	ORG-4AC24FAB-C229-C75F-C348-7E90876...
Structure	hierarchical

To the right of the table, there is a text area with the following text:

**Organization**  
This element describes a particular organization. Different views or organizational paths through the content can be described, using multiple instances of the Organization element.



# RELOAD Content Packager

The screenshot displays the RELOAD Editor interface for a SCORM 2004 package. The main window shows a tree view of the package structure under the name 'MANIFEST-7C6F3037-12B9-F903-5504-9A4C51A99520'. The tree is organized into 'Metadata' and 'Resources' sections. The 'Metadata' section includes 'ADL-SCORM', '2004 3rd Edition', and 'Organizations'. The 'Organizations' section is expanded to show a hierarchy of organizations, including '南京數位文物學習網' and '南京數位文物學習網' (repeated), each with sub-entries for 'Logo', 'Icon', 'Legal Notice', and 'Personnel Information'. The 'Resources' section lists files such as 'nanjing2004/index.html', 'nanjing2004/ksupermail/LRNViewer.htm', and 'nanjing2004/ksupermail/LRNViewer.htm'.

The bottom panel displays the 'Personnel Information' attribute table and a description field.

Attribute	Value
Identifier	ITEM-16906690-B1A7-3166-4FDD-4764E930C...
Referenced element	nanjing2004/ksupermail/LRNViewer.htm
Is Visible	true
Parameters	

**Item**  
A node that describes the shape of the organization. It can reference a Resource or sub-Manifest. You can do this from the drop-down box.

# Import Metadata into Content Package(1/2)

REXL Editor

File Edit Tools View Window Help

SCORM 2004 Package - nanyang2004

Metadata - nanyang2004

Profile: IMS LRM Profile

Form View Tree View Full Form View

**General**

Identifier

Title

**Catalog Entry**

Catalog

Entry

Language

Description

Keyword

Coverage

Structure

Aggregation Level

**Life Cycle**

Version

Status

**Identification**

Role

WCod

Date

Import... Export...

OK Cancel

Import a standalone Metadata file

to-lets that is used to  
e (Package level  
meta-lets must be

You can edit the Metadata from the Edit menu or by clicking  
on the button on the toolbar.

# Import Metadata into Content Package(2/2)

The screenshot shows the Reload Editor interface. The left pane displays a file tree for 'kayting2004', listing various XML files such as 'content', 'control', 'vocab', and 'course'. The right pane shows the 'Content Package' structure for 'MANIFEST-7C6F007-1289-PR03-5304-9A4C52A99523'. The 'Metadata' section is expanded, showing a hierarchy: 'ADL SCORM' > '2004 3rd Edition' > 'Organization' > 'Organization' > '南藝數位文物學習網' > '兒童教室' > '水影' > 'Metadata'. Below this, a 'Resources' section lists several HTML files. At the bottom, a 'Metadata' panel contains a table with 'Attribute' and 'Value' columns, and a text area with instructions on how to edit metadata.

Attribute	Value

**Metadata**

This element contains content specific meta-data that is used to describe the content of the overall package (Package level meta-data). If meta-data is provided, the meta-data must be valid IMS Learning Resource Meta-data.

You can edit the Metadata from the Edit menu or by clicking on the bottom on the toolbar.

# Preview content Package

Reload Content Previewer - Microsoft Internet Explorer

檔案(F) 編輯(E) 格式(O) 我的最愛(S) 工具(T) 說明(H)

← 上一頁 · → · 搜尋 · 我的最愛 · 網 · 移至 · 地址

網址: C:\Downloads\ed\Settings\Administrator\reload\reload-reload\preview\ReloadContentPreviewer.htm

## Reload Content Package Preview

水彩


← prev next

Organization

- [-] 南國數位文物學習網
  - [-] 兒童教室
    - [-] 故事
    - [-] 國畫
    - [-] 書法篆刻
    - [-] 素人畫家講座
  - [-] 一般教室
    - [-] 水彩
    - [-] 國畫
    - [-] 書法篆刻
    - [-] 素人畫家講座
  - [-] 進階教室
    - [-] 水彩
    - [-] 國畫
    - [-] 書法篆刻
    - [-] 素人畫家講座

### 水彩一般教室

- 第一堂 初識水彩世界
  - 第一節 水彩畫的特質
    - [-] 1-1 水彩畫的意義
    - [-] 1-2 水彩畫的性質
  - 第二節 材料與工具
- 第二堂 兩瓶水彩畫折
- 第三堂 與水彩玩遊戲



Watercolor Classroom

1-1 水彩畫的意義

Close Outline + + 1-1 水彩畫的意義

我的電腦

# Conclusion and Ongoing Work

# Conclusion and Ongoing Work

- Toward TW LOM
  - the test will be further extended to local learning resources webs
  - more categories of samples will be included too, such as high school, community college and advanced education. Trials on widened domains, such as government, enterprise learning repositories, could help to shape a more appropriate TW LOM.
  - Public Hearing on the TW LOM (July 4 2005)
  - As the National Standard (Spring of 2007)
- Toward Depth in the Metadata Application Profile
  - the metadata application profile must be compatible not only data structure standards (like IEEE LOM), but also data content and data value standards
  - Although parts of the data content standard have been defined in the IEEE LOM and its derived application profiles like CanCore, it need have well-established rules for a data content standard.
- Toward Ontology-based Metadata Framework
  - Knowledge engineering methodology
  - Competency Questions, CQs
  - Protégé ...

# References

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- RELOAD Project: <http://www.reload.ac.uk/>
- 文建會網路學院 <http://case.cca.gov.tw/case5/>
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Thank you  
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