Construction information Classification System in Japan

Key Technology to advanced IT practices

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Construction information Classification System in Japan

- Standard of utilization of unit information
- Fundamental basis for common use and linkage of information
Major Technologies relating to CALS/EC

- XML (Tag-set)
- Metadata
- DM-CAD-GIS
- GDB (General Database)
- Object oriented approach
- CAD layering system
- Electronic Specification
- LCS (Life-cycle Support)
- Web Technology (Semantic Web)
- Model (Project/Product/Process)
- R&R/LCDM
- CAD Property-set

They don’t work efficiently/practically without JCCS
A facility to divide space and may insulate, protect, secure and support loads.
Communication

sender

intention → coding

Knowledge/sense → code → decoding

receiver

Knowledge/sense → recognition

to be specified
Problems against Standardization of Terminology

COLLECTION OF TERMS is only a starter of JCCS development,

IDENTIFICATION OF CONCEPT is a key task to JCCS implementation.
Problems to be solved / Issues to be challenged

- Each domain member/system is liable to regard their domain to be the whole world, and doesn’t like to change the way how to use their own terminology and concept definition.
- Existing systems are mostly developed with self-contented core technologies like coding and/or classification systems to be difficult or impractical to be changed afterwards.
- Many Japanese people are not accustomed to strict semantic consideration.
International Situation relating to Standardization of Classification in AEC

- **UDC, ABC, CI/SfB, CIB/Master List**: Classification systems based on traditional documentation handling method
- **ISO 12006-2**: IS of standardized framework for classification of construction information
- **ISO 12006-3**: IS of standardized framework for construction information based on object-oriented technology
- **Uniclass**: UK standardized classification system based on ISO12006-2
- **OCCS**: North American standardized classification system based on ISO12006-2
- **IFD**: International Framework for dictionary based on ISO 12006-3
ISO-12006

Organization of information about construction works

ISO 12006–2

Part 2: Framework for classification of information

to specify the way how to prepare classification tables based on the RESOURCE-PROCESS-PESULT concept.

ISO 12006–3

Part 3: Framework for object-oriented information exchange

to specify the way how to tackle with classifying various information by OO approach
### External libraries
Sources of information based on RDL objects or existing structures mapped to RDL objects through templates

<table>
<thead>
<tr>
<th>Knowd.lib</th>
<th>Product libraries</th>
<th>Project libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge libraries, standards...</td>
<td>GDL, object lib, picedb...</td>
<td>Briefing, FM, program...</td>
</tr>
</tbody>
</table>

### Templates (mapping)
Provide mapping between neutral objects and different ways to represent/present them

<table>
<thead>
<tr>
<th>Ifc template</th>
<th>Product template</th>
<th>Search template</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ifc-RDL mapping</td>
<td>Product properties...</td>
<td>Advanced search, etc.</td>
</tr>
</tbody>
</table>

### National Dictionary
Language independent reference objects (RDL object) and relationships with unique ID’s.

- **BARBi method**
  - Norwegian names and descriptions
- **LexiCon method**
  - Dutch names and descriptions
- **Edibatech method**
  - French names and descriptions
- ... Names and descriptions in other languages

### ISO/PAS 12006-3
Framework for object-oriented data exchange. EXPRESS data model giving the framework for reference libraries.

Submission checker - Rules for population of Reference Data Libraries based upon ISO/PAS 12006-31 (EXPRESS/EXPRESS-X)
IFD: International Framework for Dictionaries

- Developed and maintained by ISO/TC 59/SC 13/WG 6

- EXPRESS model standardized in ISO 12006-3

IFD requirements:
- Definition of terminology
- Classification of terminology based on ISO 12006-3
- Relationship between terminologies

Libraries under development
- BARBi (Norway)
- SDC (France)
- Lexicon (Netherlands: STABU)
Example: LexiCon specification of a door
Interface example

Norwegian input

Translation by GUID -> concept -> language representation

Dutch output

This concept carries the same unique identification in every language:
78AF4E98C8D4406B873DBB85E1FE7DB

BARBi - Norway
78AF4E98C8D4406B873DBB85E1FE7DB
Properties
Concept Name: WINDOW

LexiCon - Nederland
Properties
Concept Name: RAAM

Same GUID: 78AF4E98C8D4406B873DBB85E1FE7DB
Same concept
Same properties
Same WINDOW
But with
Dutch name: RAAM

XM-7 IAI Washington 13 May 2003
Specification of JCCS

- Standardized Terminology/Concept System for AEC domain in Japan
- IFD of Japan (based on ISO)
- Foundation of CALS/EC (Linkage with CAD, GIS, e-Delivering, etc.)
- Co-existence with Legacy terminology/classification systems
- Collaboration with academies and public organizations
- Neutrality from referring systems and information
- Clearly organized relationship with related terminologies
- Clear identification of concepts/terms
- Equipped with responsible maintenance system
ISO 12006-2

What specified the way of tackling which defines the framework and composition of construction information which exist in the flow which makes “construction resources” a “construction result” according to a “construction process”, and expresses it in table form.

It unites with construction information (Japan) and is table-ization about information.

Preparation of JCCS basic table

What classified the information about construction according to table form from two or more viewpoints in consideration of the construction situation of our country.
### Legend

- **Green**
  - Same class as ISO12006-3

- **Orange**
  - New class with reference to ISO12006-3/IFC2x

- **Yellow**
  - New class with reference to ISO12006-3/IFC2x and others

### Root
- **Relationship**
  - **Collection**
    - **Object**
      - **Construction Product**
        - **Project**
        - **Process**
        - **Control**
        - **Actor**
        - **Resource**
        - **Value**
        - **Measure with Unit**
        - **Unit**
      - **Spatial Structural Element**
      - **Physical Element**
      - **Site**
        - **Structure**
      - **Space**
      - **Structure-specific Space**
      - **Common Space**
      - **Network Structure**
      - **Area Structure**
      - **Sectional Structure**
      - **Independent Structure**
      - **Furniture**
      - **Exterior Element**
      - **Service Element**
      - **Finishing Element**
      - **Structural Element**
Registration of basic terms (JCCS basic tables) around 9,000 terms have been registered (in May 2005)

<table>
<thead>
<tr>
<th>Table</th>
<th>terms</th>
<th>Referenced documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Product</td>
<td>~1,000</td>
<td>• AIJ coding system WG (Draft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Building Design Datasheet/Unit Space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CORINS / TECRIS</td>
</tr>
<tr>
<td>Resource</td>
<td>~3,000</td>
<td>• AIJ coding system WG (Draft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Construction machinery cost table</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Construction Cost DB</td>
</tr>
<tr>
<td>Process/Management</td>
<td>~1,000</td>
<td>• AIJ coding system WG (Draft)</td>
</tr>
<tr>
<td>Actor</td>
<td>~1,000</td>
<td>• AIJ coding system WG (Draft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Japan Industry Classification Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CORINS / TECRIS</td>
</tr>
<tr>
<td>Attribute</td>
<td>~3,000</td>
<td>• AIJ coding system WG (Draft)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Construction Cost DB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CORINS / TECRIS</td>
</tr>
<tr>
<td>Value</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Mesure with Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thank you for your attention.
OCCS：12 (+) 構築環境情報ファセットのテーブル群

検討組織
WG0 : 全体調整
WG1 : Facilities 〜 Spaces
WG2 : Elements 〜 Products
WG3 : Process（表07〜11）
WG4 : Attributes, Terminology

個別クラスは一箇所にのみ現れる。
オブジェクト列挙の規定要素:
1) complexity of the object
2) its desired level of granularity

精緻な分類は複合による。
例 : steel suspension footbridge
Tab01: 2111 : 運輸施設/橋/Foot
Tab02: 3400 : 橋/Suspension
Tab12: 12170 : 材料/金属系/Steel

(01) 2111 : (02) 3400 : (10) 12170
<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Form of information</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Subject disciplines</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Construction entities</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Spaces</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Elements for building</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Elements for civil engineering works</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Work sections for building</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Work sections for civil engineering works</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Construction products</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Construction aids</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Properties and characteristics</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>UDC (Universal Decimal Classification)</td>
<td></td>
</tr>
</tbody>
</table>

Ex. Ducts
- as element for building: G631
- as entities: E73
- as products (HVAC): L7561
- as worksection: JY3
Construction Classification System in Japan (JCCS)

A base is given.
建築CADレイヤ標準ISO13567-2の基本構成

<table>
<thead>
<tr>
<th>Mandatory</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
</tr>
</tbody>
</table>

- **Presentation** (表現)
- **Element** (構成要素)
- **Agent responsible** (責任主体)
- **Work package** (生産要素)
- **Scale** (縮尺)
- **Projection** (投影法)
- **Phase** (適用時期)
- **Sector** (領域)
- **Status** (状態)