Invited Paper

Japan Metadata Profile (JMP) for Geographic Information Clearinghouses

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Abstract

This paper aims to introduce Japan Metadata Standard (JMP) 1.1a as a normative annex of the draft metadata standard in Japan. It is produced by WG3 in the Joint Study Group that is organized by Geographical Survey Institute. 38 private companies in Japan are cooperating in it. JMP 1.1a is a profile of ISO/CD 15046-15 Metadata and it includes Cataloguing Information, Data Quality Information, Lineage and it ensures the possibility to link an application schema if it is open to users on the Internet. The Japanese draft metadata standard will be revised to harmonize with ISO/DIS 19115 in fiscal 2001.

Keywords: *Metadata, JMP, Geographic information*

1. Introduction

Since 1994, ISO/TC211 have continued the effort to establish the standards on Geographic Information/Geomatics. TC211 is now dealing with more than 30 standards. In this family of standards, there is a part titled as "Metadata". Metadata is defined as "data about data" in ISO/TC211. This international standard (It will be ISO/IS 19115) defines the schema required for describing geographic information and services. While in 1996, Geographical Survey Institute (GSI) under Ministry of Land, Infrastructure and Transport in Japan started the joint study on Geographic Information Standards with 38 Japanese private companies. The aim of this activity is to establish Japanese standards harmonized with TC211 standards. Products of this effort include Japan Metadata profile 1.1a. It is approved as the draft standard for geographic information clearinghouses by the steering committee on Geographic Information Standards in 2000. GSI now uses JMP 1.1a for their Clearinghouse Gateway. And they recommend it to other national and provincial organizations as a technical standard.

This paper at first introduces the joint study by GSI and Private companies. Then the author briefly explains the content of Japan Metadata Profile (JMP) version 1.1a and the works planed for the future.

2. The Joint Study Group

GSI together with 38 private companies began the study about practical uses of TC211 standards and about Japanese national standards conforming to TC211 standards in 1996 [1]. The structure of the organization is shown in Figure 1. The chairperson of the steering committee is Prof. Dr. Masao Iri (Chuo University). 5 working groups are constituted under the steering committee. WG1 deals with Spatial Schema, Temporal Schema, Rules for Application Schema, Encoding and Portrayal. WG2 deals with Spatial Referencing and Quality. WG3 (the project leader is Morishige Ota) deals with Metadata, Feature Cataloguing Methodology, and Terminology. WG4 deals with Data Product Specifications. WG5 deals with harmonization of standards and dissemination of products of this effort.
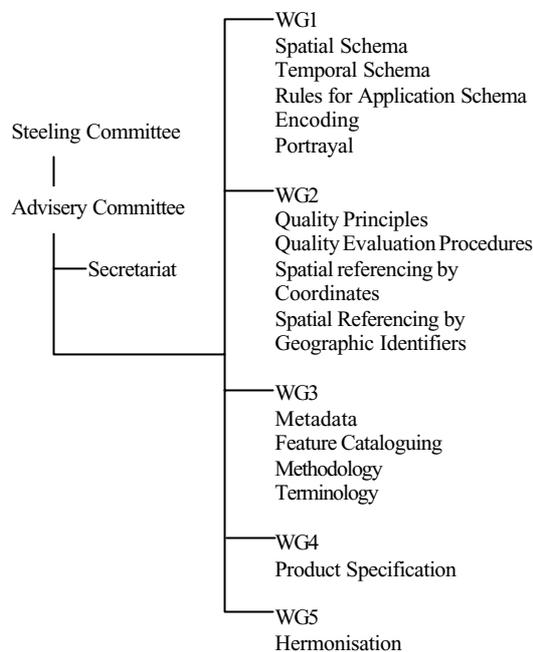

Figure 1. The structure of the Joint Working Group

3. Activity of WG3

WG3 provided the first draft standard in July 1999 as Metadata Version 1.1. It was the translation of ISO/CD 15046 Geographic information – Part 15: Metadata (1998-07-09). However many users claimed that (1) standard should be simpler; (2) it should aim the dissemination of clearinghouses; (3) the education to the users should be easier. To answer these demands, WG3 investigated about the situation of other countries and found 3 cases shown in Table 1. These examples have realized to make core metadata standard as profiles of ISO/TC211 and/or CEN TC184 standards.

Table 1. Examples of the national metadata standards

| The name of standard/ Country/Organization	Major elements (No. of elements having values)
Core Template/ Ireland/ IRLOGI (Irish Organisation for Geographic Information)	Identification Extend Distribution Administration Quality Metadata (38)
The ANZLIC Metadata Guidelines : Core Metadata Elements for Geographic Data in Australia and New Zealand Version 2/ Australia, New Zealand/ ANZLIC (Australia and New Zealand Land Information Council)	Dataset Custodian Description Data Currency Dataset Status Access Data Quality Contact Information Metadata Data Additional Metadata (33)
Discovery Metadata Guidelines Version 1.2/ United Kingdom/ NGDF (National Geographic Data Framework) Management Board	Title Alternative Title Originator Abstract Data Capture Period Presentation Type Access Constrain Use Constrain Keywords Geographic Extent Spatial Reference System Level of Spatial Detail Supply Media Data Format Additional Info Source Dataset Association Supplier Date of Update of Metadata Sample (35)

As a result, WG3 decided to construct a simple discovery level profile, which complies with ISO 15046-15 as the base standard. WG3 chose the conformance level 1 (Cataloguing information section) as a profile and extended it so that (1) this profile aims to preserve an accessibility of the data using the clearinghouse, (2) data providers can represent the quality of their spatial data, (3) the application schema provided for the data can be referred if it is publicly open.

This draft standard is called as Japan Metadata Profile (JMP) V1.1a. The steeling committee of the Joint Study approved it as a normative annex of the Metadata standard Version 1.1a on May 2000. After the approval, Geographical Survey Institute (GSI), established their clearinghouse gateway and they started to provide metadata following JMP 1.1a. GSI and WG3 provided the metadata editor and the use's guide. Users can freely download them with the document of JMP 1.1a through the Internet (http://zgate.gsi.go.jp/ch/aboutmetadata.html). Furthermore, Ministry of Economy, Trade and Industry (METI) adopted it as their standard and they appended the element "browse graphic" on their metadata. Today other organizations including several prefectures also use JMP 1.1a for their metadata standard.

4. Japan Metadata Profile (JMP) 1.1 a

JMP 1.1a consists of one mandatory section and two conditional sections (See Figure 2).

Cataloguing Information is a mandatory section and it includes sections, entities and elements shown in Table 2. In the table, Responsible Party, Data quality, and Lineage are the references of entities.
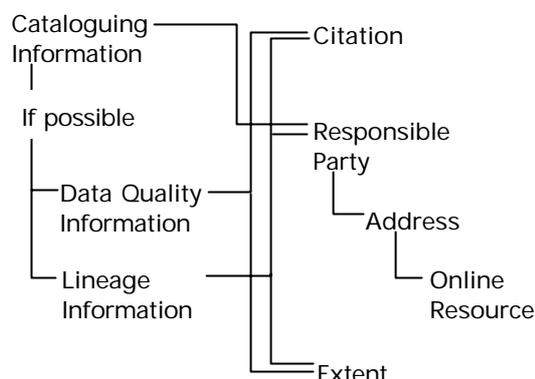
Figure 2. The structure of JMP 1.1a

Table 2. Cataloguing Information section in JMP 1.1a schema

No.	Name	Definition	Obligation/ Condition	Dublin Core Element corresponding to JMP 1.1a
0	Cataloguing information	Information to uniquely identify an entire dataset and/or dataset series	M	
1	Metadata file identifier	Unique identifier for this metadata record	O	
2	Metadata parent identifier	Unique identifier of the parent metadata record	O	
3	Title	Name by which the dataset is known	M	Title
4	Edition	Version of the titled dataset	O	
5	Series name	Name of the series publication of which the dataset is part	O	
6	Issue identification	Information identifying the issue of the series publication of which the dataset is part	O	
7	Initiative identification information	Initiative under which a dataset is compiled or produced—used as a means of identification	O	
7.1	Initiative type	Description of the identifier of initiative used in the identification	O	
7.2	Initiative name	Name of initiative used for identification	M	
8	Reference date	Date and time when the dataset was published or otherwise made available for release.	M	Date
9	Responsible party information	Responsible party information for an individual or organisation that is knowledgeable about the dataset	M	Creator, Publisher, Contributor
10	Dataset extent	Horizontal and vertical extent covered by the dataset	M	Coverage
10.1	Geographic extent coordinates	Geographic areal domain of the dataset	C/ Geographic name not used?	
10.1.1	West bounding coordinate	Western-most coordinate of the limit of coverage expressed in longitude	M	
10.1.2	East bounding coordinate	Eastern-most coordinate of the limit of coverage expressed in longitude	M	
10.1.3	North bounding coordinate	Northern-most coordinate of the limit of coverage expressed in latitude	M	
10.1.4	South bounding coordinate	Southern-most coordinate of the limit of coverage expressed in latitude	M	
10.2	Geographic extent name	Commonly used or well known name of a place, area or region which describes a spatial domain of the dataset	C/ geographic extent coordinates not used?	
10.2.2	Geographic extent name reference	Gazetteer or other reference used for geographic extent name	O	
11	Resolution level code	Factor which provides an understanding of the density of spatial data	O	
12	Language of dataset code	Language(s) used within the dataset	M	Language
13	Dataset character code set	Character code set used by dataset	C/ ISO 8859-1 not used	
14	Abstract	Brief narrative summary of the dataset	M	Description
15	Purpose	Summary of the intentions with which the dataset was developed	O	
16	Progress code	Status of dataset	O	
17	Category	Words or phrases summarizing a subject of the dataset	M	Subject

No.	Name	Definition	Obligation/ Condition	Dublin Core Element corresponding to JMP 1.1a
17.1	Theme code	High-level non-overlapping geospatial data thematic classification to assist in the grouping and search of available geospatial data sets	M	
17.2	Keyword information	Keywords, their type, and reference source	O	
17.2.1	Keyword (s)	Common-use word(s) or phrase(s) used to describe the subject of the dataset	O	
17.2.2	Keyword type code	Method used to group similar keywords	O	
17.2.3	Keyword thesaurus name	Name of the formally registered thesaurus or a similar authoritative source of keywords	O	
18	Access constraints	Access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the dataset.	O	Rights
19	Use constraints	Constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the dataset	O	Rights
20	Lineage	Lineage information	C/ If it is possible to describe	Source
21	Data quality	Descriptive quality information	C/ If it is possible to describe	
22	Spatial representation type code	Method used to represent geographic information in the data set.	O	
23	Spatial reference system type code	Reference system used to spatially locate information in the dataset.	O	
24	Distribution identifier	Identifier by which the distributor knows the dataset	O	Identifier
25	Distribution format name	Name of the data transfer format, such as DXF and ARC/INFO	O	Format
26	Distribution media	Name of the media on which the dataset can be received	O	
27	Distribution on-line resource linkage	Uniform Resource Locator (URL) to access the dataset	O	
28	Application Schema URL	Uniform Resource Locator (URL) to access the application schema	O	
29	Level of conformance code	Conformance level of metadata. It is always 1.	M	
30	Language of metadata code	Language used within metadata	M	
31	Metadata character code set	Character code set used by dataset	C/ ISO 8859-1 not used	
32	Metadata date	Date that the metadata were created or last updated	M	

Note: This table represents a part of JMP 1.1a. It ignores maximum occurrence, data type and domain. This table does not include those entities that describe Responsible Party, Data Quality, and Lineage. The shaded column links to these entities.

5. JMP 1.1a and Dublin Core

5.1 Elements

Table 2 shows the corresponding elements including Dublin Core Metadata Set Version 1.1 (Simple Dublin Core)

with JMP 1.1a. There are two elements not correspond to JMP 1.1a. They are "Type" and "Relation". "Type" is not required to JMP 1.1a as the metadata is always on geographic information. "Relation" is defined as a reference to a related resource. And it is recommended that best practice is to reference the resource by means of a string or number conforming to a formal identification

system. JMP 1.1a have a capability to describe the data as a part of the dataset series but the concept of "Relation" is wider than "Series name".

5.2 Obligation

"Rights", "Identifier", "Source", and "Format" in Dublin Core are not mandatory in JMP 1.1a.

5.3 Issues

Dublin Core is simple and useful for general purpose but it does not have a capability to describe the detail for geographic information. There may be two solutions for this issue. The first is that JMP includes Dublin Core in its core metadata. The second is that we describe both Dublin Core and JMP for each data.

The second solution seems to be practical but it requires rather complex clearinghouse management system and the cost to describe both metadata. However the first solution requires the full harmonization between Dublin Core and JMP.

6. Future Works

WG3 in the Joint Study Group are currently improving Japan Metadata Standard to follow ISO/DIS 19115 – Metadata. The improved JMP will be harmonized with the core metadata in ISO/DIS 19115. Harmonization with Dublin Core should be also investigated to resolve the issue mentioned above.

WG3 in the Joint Study Group aims to publish Metadata Standard V2.0 with JMP 2.0 as a normative annex in fiscal 2001. We expect that it will be Japan Industry

Standard (JIS) after revision to solve the editorial issues including in ISO/DIS and ISO/FDIS 19115.

7. Summary

In this paper the author introduced the Japanese core metadata standard for the discovery of geographic information. It is called JMP 1.1a and it is a normative annex included in the draft metadata standard harmonizing with ISO/CD 15046. This standard will be revised and harmonized with ISO/DIS 19115. JMP 1.1a will be improved and be a normative annex of new draft metadata standard published until the end of fiscal 2001. We are expecting that this draft standard will be a source to construct Japan Industrial Standard (JIS).

8. Reference

[1] Kazuhiko Akeno, Norishige Kubo. "GI Standardisation in Japan" *GIM International*, December 2000, Vol. 14, No. 12, pp. 44-45.

[2] Matthew Ovington, "Geo-ID: Developing a metadatabase for Irish Geographical Information" LGCSB (Local Government Computer Services Board) annual conference in Dublin, Ireland, May 1999, http://www.tcd.ie/Geography/GIS/conf.html

[3] ANZLIC Metadata Working Group, "The ANZLIC Metadata Guidelines: Core Metadata Elements for Geographic Data in Australia and New Zealand Version 2" February 2001

[4] NGDF Management Board "Discovery Metadata Guidelines Version 1.2" March 2000