

A Study on Metadata Mapping for Semantic Interoperability

(Young Man Ko)*, (Tae-Sul Seo)**, (Tae-Hoon Lim)***

가

(DEC)

ABSTRACT

This paper contains an analysis of the methods that have been used to achieve or improve interoperability among metadata and discuss the possibilities and limits of semantic interoperability among metadata using crosswalk. After that a semantic metadata mapping process which is able to maximize the interoperability among metadata is suggested. The methodology consists of four steps such as identifying metadata schema, finding common data element concepts(DECs), grouping attributes by the DECs, and mapping into a table. An experimental application of the process was performed onto two human resource information metadata standards developed in Korea.

metadata, metadata crosswalk, metadata registry, semantic interoperability, mapping table, human resource information

* (ymko@skku.ac.kr)

** (tsseo@kisti.re.kr)

*** (taehoon@dpc.or.kr)

1.

가 . (2005).

(data element)

heterogeneities)가 . (semantic

interoperability) (semantic et al. 1999). “InfoSleuth ” (Fowler

가

가

(2007) 가

(2003)

“RDF(resource description framework, RDF)”

RDF 가

(metadata 가 (2005)

registry : MDR) 가

가

가 .

Pham(2007)

“ ISO/IEC 11179 - MDR ”

가

(crosswalk)
(USMARC), (LOM),
(Dublin Core)

가

“ ISO/IEC 11179-3 ”

“ XML ”

(Light et al.

2003)

(Godby et al.

2004)

“METS(Metadata Encoding
and Transmission Standard)”

가

“ OCLC”, “ UKOLN”, “ Getty ”, “ DLESE ”

2.

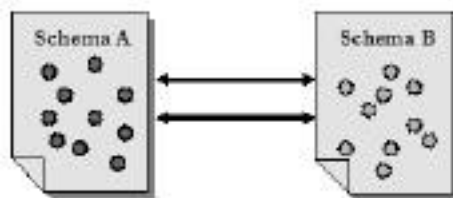
(<http://www.slis.lent.edu/~mzeg/metadata/crosswalks.htm>),

2.1

가

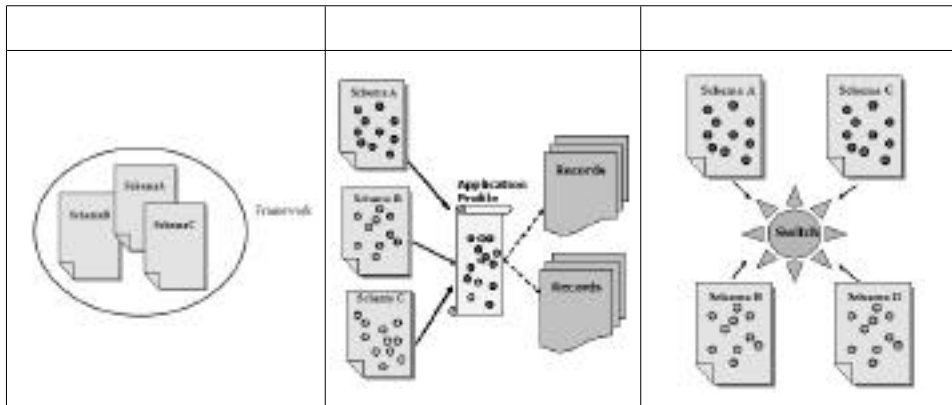
가

“ source ”



< 1>

(Chan et al., 2006)



< 2>

(Chan et al., 2006)

“target”

(1).

가 가

(2).

(Chan et al. 2006)

2.2

가

(metadata framework),

(application profile), (switching - cross)

1 1

가

가

가 metadata mapping : SMM) ”
 , 가
 , 가
 1 1 가
 가
 가 가 1:1
 (St. Pierre et
 al. 1998) 가 (National
 Information Standards Organization :
 NISO)

가
 ISO/IEC 11179
 (property)
 (representation)
 (data element
 concept : DEC)
 “ ISO/IEC 11179-
 MDR ”

“ (semantic

< 1 >

	DC	MARC	GILS
	15		10(79 가)

가 가

가 (object)
" ISO/IEC 11179 "

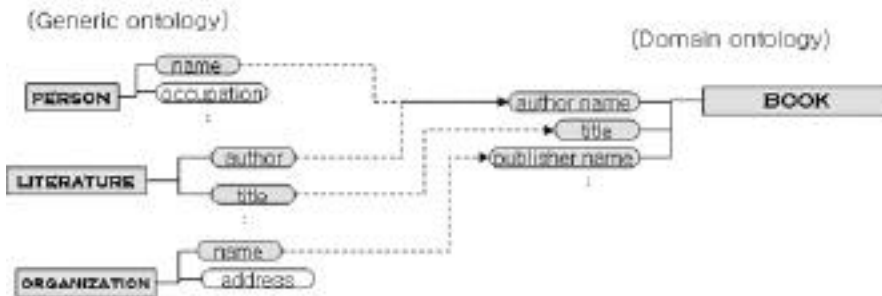
가, 가, 가 (top down)

가, "GILS"

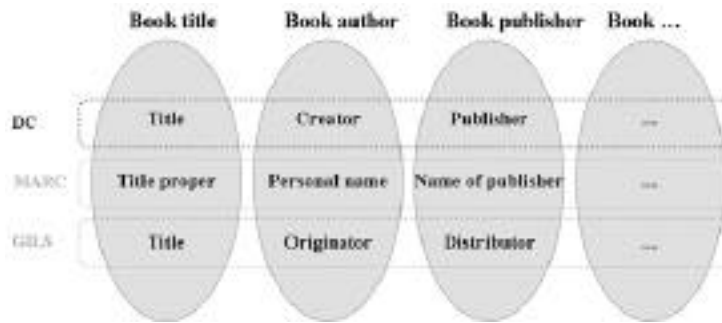
1 (1)

가 가

3



< 3 >



< 4>

가

가

가

가

< 4>

가

< 2>

()	()	()	GILS ()	()
Book title	Title	Title proper (L/lower)	Title	Book title
Book author	Creator (T/preferred)	Personal name (D/generic)	Originator(T preferred)	Book author name Book author identifier . .
Book publisher	Publisher	Name of Publisher (N/order)	Distributor (T/preffered)	Book publisher name Book publisher identifier . .
---	---	---	---	---

(L: Level, D: Domain, T: Term, N: Naming rule)

. < 2> , , “ L ” (level difference)

GILS (upper term) (lower term)

“ D ”

3.2 (domain difference)

“ T ”

(term difference)

(synonym)

“ ISO/IEC 11179-3 Registry and basic attributes ” (preferred term) (antonym)

“ N ”

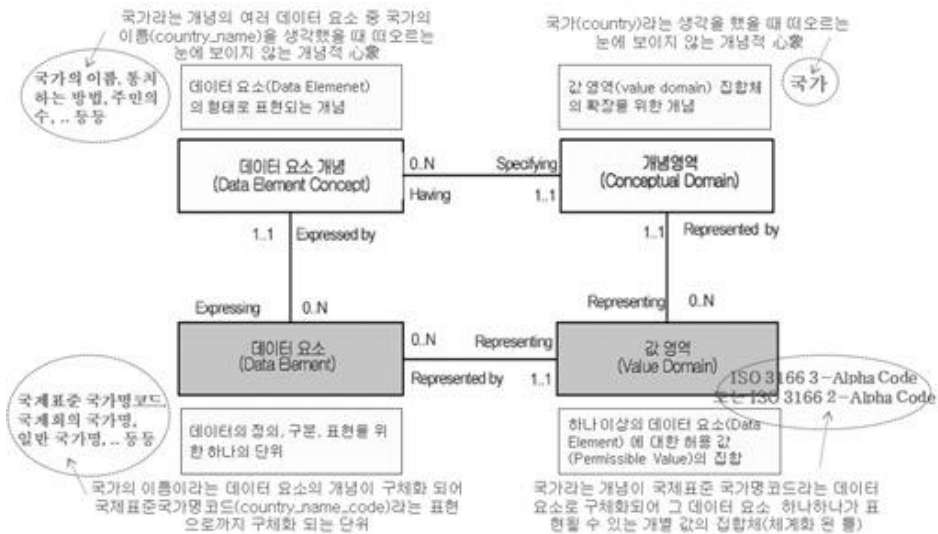
(naming rule difference)

(order)

(representation)

가

“ L, D, T, N ”



< 5> ISO/IEC 11179 Registry Metamodel

4.

2005

가
 , 95 70
 15 13 (1,
 2), < 3>
 가가 (3).

4.2

가 (1, 2).

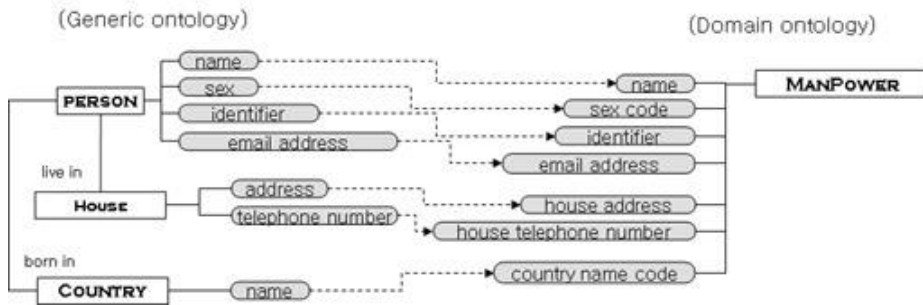
4.1

2005 (6).

“ ”

< 3>

()	95 (15)	70 (13)
	2005	2005



< 6 >

가, , “ , , , , , 7
 . 7 “ , , 가, 7
 , , , ” 가 ,
 (4). 7 가
 4.3 (1, 2).
 7 가 9
 15 (5).
 13 . 7

< 4 >

(objects)	
(properties)	, , , 가, , ,
(DECs)	, , , 가, ,

< 5>

	, 1, 2,	, ,
	,	,
(가)		-
가		
	,	,
	,	,
(가)		

4.4

가
 .
 가
 (L) 가 가 16
 (T) , 가 13
 (N) 가 (6
 (D)).
 가 “ ”
 .
 (가) ,
 가 (가) 가
 , (6
).

< 6 >

		(T:syn)	
	1 (L:lo,N:rep)	(L:lo)	
	2 (L:lo,N:rep)		
		(T:syn)	
	(L:lo)		
가	(T:syn)	(T:syn)	가
		(L:lo)	
		(L:lo)	
		(L:lo)	
		(L:lo)	
		(L:lo)	

L: (up: upper term/lo: lower term), D: ,
 T: (syn: synonym/ant: antonym/pre: preferred term),
 N: (ord: order/rep: representation)

5.

“ (L), (D), (T), (N) ”

“ ”

“ ”

“ ”

가

“ ”

“ ”
가

. 2005. 『 』 37(1): 1 59-73.

. 2005. 가 『 』 2005.3.9, : .

, . 2005. 『 』 22(4): 97-109.

. 2005. (1).

STI - S.2005 - 3.03. , Pham, D. T. 2007. 『 』 35(3): 109-123.

: EDM 가 Burgman, Michael K. 2006. “ Models

- of Semantic Interoperability”, Blog. [cited 2006. 12. 14]. <<http://www.nbergman.com/?cat=16>>.
- Chan, L. M. and Zeng, M. L. 2006. “Metadata Interoperability and Standardization: A Study of Methodology (Part I) Achieving Interoperability at the Schema Level, D-Lib Magazine, 12(6), [cited 2007. 10. 8]. <<http://www.dlib.org/dlib/june06/chan/06chan.html>><<http://www.lss.lent.edu/~mzeng/metadata/crosswalks.htm>>.
- Godby, C. J., Young, J. A. and Childress, E. 2004. “A Repository of Metadata Crosswalks.” D-Lib Magazine, 10(12), [cited 2007. 10. 8]. <<http://www.dlib.org/dlib/december04/godby/12godby.html>>.
- Fowler, J., Perry, B., Nodine, M., and Bargmeyer, B. 1999. “Agent-Based Semantic Interoperability in InfoSeuth.” SIGMOD Record, 28(1): 60-67.
- ISO/IEC JTC1. 2003. ISO/IEC 11179 Information Technology - Metadata Registries.
- Lightle, K. S. and Ridgway, J. S. 2003. “Generation of XML Records across Multiple Metadata Standards.” D-Lib Magazine, 9(9). [cited 2007. 10. 8]. <<http://dlib.org/dlib/september03/lightle/09lightle.html>>.
- Pierre, M. St., LaPlant, W. P. Jr. 1998. “Issues in Crosswalking Content Metadata Standards.” [cited 2007. 10. 8] <<http://www.niso.org/papers/whitepapers/crosswalk.html>>.

1 :

()	()	/			
(Personal ID Number)	char(14)		.	가	
(Research ID Number)	char(20)			가	
(Name)	char(20)			가	
¹ (Family name)	char(64)		.	가	가
² (First/Middle name)	char(32)			가	가
(Chinese name)	char(32)			가	
(Sex)	char(1)		() , , ,	가	: ISO/IEC 5218
(Date of Birth)	date		() 2004. -03-22	가	: ISO 8601 YYYY-MM-DD
(Nationality)	char(3)		() KOR, GBR, USA	가	가 : ISO 3166
(Zip Code)	char(7)		,		
(Address)	char(64)		가		
(Telephone)	char(14)		가		
(Cellular phone)	char(14)		가		
(E-mail Address)	char(64)		가 가		
(URL)	char(128)				

2 :

	HMDE001	- -	NUMBER	
	HMDE002	- -	NUMBER	,
	HMDE003	-	STRING	
	HMDE004	-	STRING	
	HMDE005	-	STRING	
	HMDE006	- -	NUMBER	ISO 5218
	HMDE007	- -	STRING	ISO3166 - 1
	HMDE008	- -	NUMBER	
	HMDE009	-	STRING	
	HMDE010	-	NUMBER	
	HMDE011	-	NUMBER	
	HMDE012	-	STRING	
	HMDE013	- -	STRING	