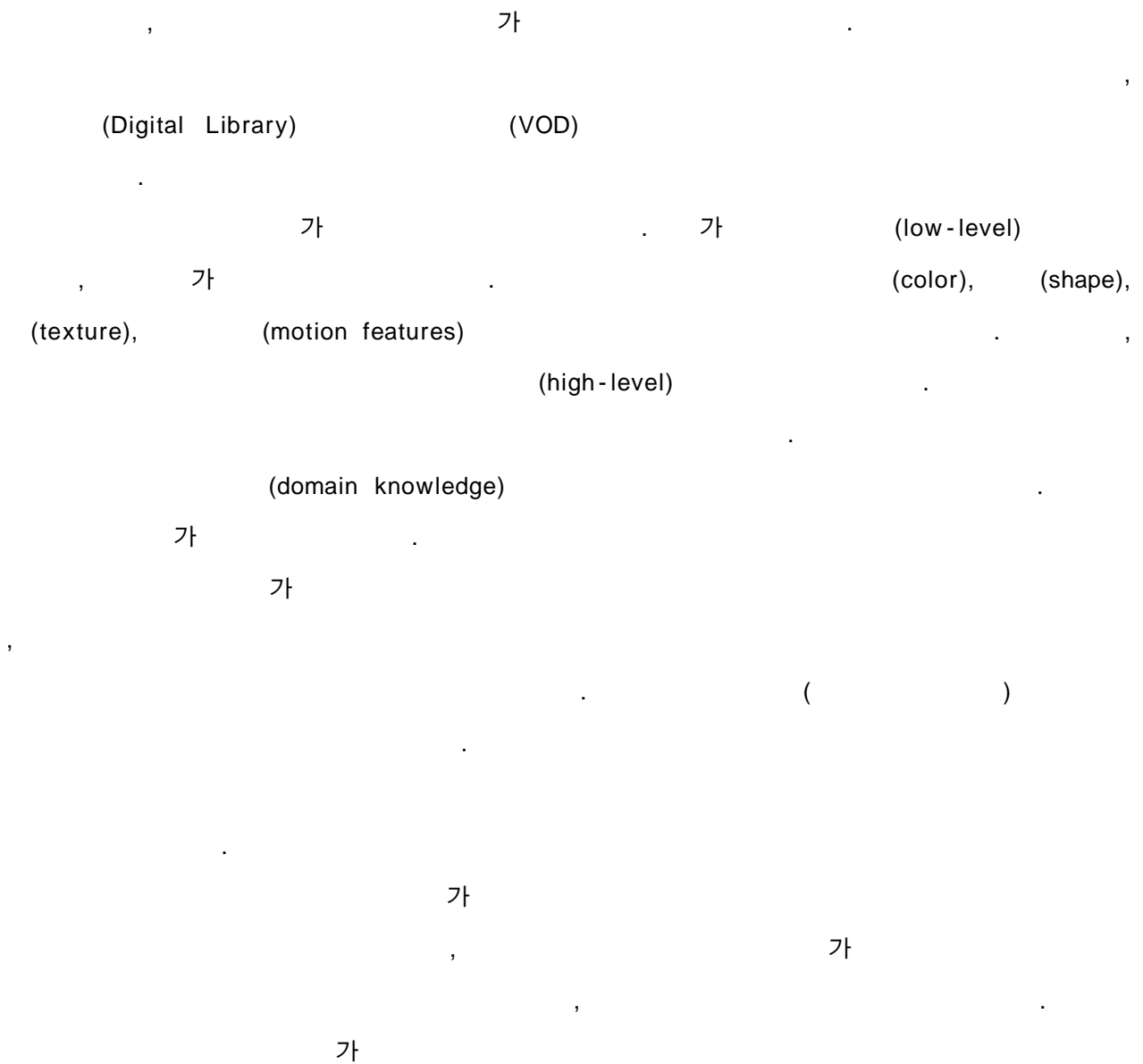


XML

(XML Based Video Metadata Modeling and Implementation of Video Retrieval System)



XML(eXtensible Markup Language) XML 가 , (element)가 가

XML XML eXcelon ,

XQL(XML Query Language)

XML XSL(eXtensible Stylesheet Language)

XML ,

ABSTRACT

As internet and information technology have been developing recently, extensive research efforts have been made with regard to the efficient storing, indexing, and retrieving multimedia data as well as text data. Specially, video data, which was representative data of multimedia data, is becoming an important factor in a various application area such as Digital Library and Video On Demand (VOD) system.

Video content can be grouped into two types : low-level visual content and semantic content. Low-level visual content is characterized by visual features such as color, shape, texture, motion features and so on. On the other hand, semantic content contains high-level concepts such as objects and events. The main distinction between these two types of content is different requirements for extracting each of these contents. The process extracting the semantic content is more complex, because it requires domain knowledge or user interaction, while extraction of visual features is usually domain independent. This extracted content information is metadata.

This paper focused on the fact that users usually want to the query of the video content instead of raw video data itself. For example, a user will ask for video and specific part of video which contain some semantic information. So, this paper classified video content (or metadata) semantically according to logical hierarchy. The point, in this paper, is that the proposed modeling is to improve performance of existing content-based retrieval system and to complement its disadvantage.

It is necessary to extract, classify, and model video metadata, that can describe features included in video, in order to manage video data, which is characterized by the large scale and atypical data efficiently by analyzing various user's requests and query types. In designing video retrieval system, video metadata is very important because it plays an important role as a mediator between users and video data and influences on the performance of search and results.

This paper uses XML as a modeling method to structure and represent video data. XML document is an object and its element as an object unit can include another element related to that semantically. And XML represents the structure of document hierarchically. So, it is suitable for structuring video data logically and semantically. The XML document that is written by the structured data model and video data are stored in eXcelon server, XML data server, and the part of XML document is retrieved using XQL(eXtensible Query Language). By applying a proper XSL(eXtensible Stylesheet Language) document to XML document results, converted results are shown to users in web.

It is expected that the logical and semantic modeling using XML will complement the drawback of existing content-based retrieval method and will be a basis of integrated modeling that reflects physical and semantic content.

I.

1.1

가
가 가 . 가 ,
(contents) 가 ,
가 . 가 가
(Digital Library), WWW(World-
Wide-Web), VOD(Video On Demand)
(segment), (frame) ,
[1,2,3,4,5,6,7,8,9,10]
가 . 가 ,
가 . , , ,

level) (high-

(domain knowledge)

(color distribution),

(query by example)

(query by sketch)

, 가

(similarity)

(measurement)

가

(angle)

(scale)가

가

가

가

가

가

가

XML

. XML

(self describing)

(tree structure)

. 가 XML

가

(element)가

가

1.2

가

가

XML

, XML

DTD XML XML DTD XML
eXcelon XML (video)
(sequence), (scene), (object) 가
가
XML 가

II
III XML
XML 가
IV III XML
V

II.
XML

2.1 가
[11][12]
가 (heterogeneous)
(inconsistency)
가 [13][14] [15]
가
(audio-visual), (spatio-temporal) (semantic)

2.2

가

2.2.1 V. Kashyap, K. Shah, A. Sheth

V. Kashyap, K. Shah, A. Sheth

[16]

가

- - (Content-dependent metadata)
- - (Content-descriptive Metadata)
- - (domain-dependent)
- - (domain-independent)
- - (Content-independent Metadata)

2.2.2 K. Bohm, T.C. Rakow

K. Bohm, T.C. Rakow

[17]

7가

- - (Content-descriptive Metadata)
- (automatic) (semi-automatic)
- (Content Classification Metadata)
- 가
- (Document Composition Metadata)
- (component) (relationship)
- (role)
- (Metadata for Document History)

(status)

- (Metadata for Document Location)

(storage)

가

- (Content Description Metadata)

(keyword)

(index),

- (Metadata for Structure Description)

(hypermedia

system)

(link)

2.2.3 W.I. Grosky

W.I. Grosky

[18]

(attribute)

(relation)

- - (Content-based Metadata)

- (Visual Feature)

- - (Content-independent Metadata)

가

가

2.1

[2.1]

V. Kashyap, K. Shah, A. Sheth	-	,
	-	
	-	
K. Bohm, T.C. Rakow	-	
	-	가
		,
		,
W.I. Grosky	-	
		,
	-	

2.3

ER(Entity-Relationship) , EER(Enhanced ER)

Plateau ER [19], VideoSTAR EER(Enhanced ER) [20]

. ER EER

(method)

/

가

[4,21,22].

ER

Plateau

, EER

VideoSTAR

OVID[4], VSDG[21],

ADMIRE[22]

2.3.1

Berkeley

(VOD:Video-On-Demand)

Plateau

[19]

(LAN)

가

. Plateau

가

[2.2]

4가

(Bibliographic, Structural, Object, Keyword)

POSTGRES DBMS

가

가

[2.2] Plateau

(index type)		
Bibliographic	VIDEO_BIB	
Structural	VSV_SHOT	(shot)
	VSV_SCENE	(scene)
	VSV_SEGMENT	(segment)
Object	PEOPLE	
	OBJECT	
	OBJ_INST	
Keyword	KW_WORDS	,

VideoSTAR(Video Storage And Retrieval) [20]

1995

. VideoSTAR

(framework) 가

(stream)

(shot)

. VideoSTAR

OVID(Object-oriented Video Information Database system)[4]

1993

(video object)

OODB

. OVID

(frame sequence)

VSDG(Video Semantic Directed Graph) [21]

(sub segment)

. VSDG

VSDG

(spatial object),

(temporal object),

(physical object) 3가

(view)

. VSDG-

VSDG - (off-line)

- (on-line)

. VSDG

VSDG

(raw video data)

ADMIRE(Advanced Multimedia Retrieval) [22]

가

. ADMIRE

. ADMIRE

(basic information object),

(composite

information object),

(pseudo information object) 3

2.3.2

Plateau

VideoSTAR

OVID

가

가

가

가

가

가

가

VSDG

ADMIRE

. [

2.3]

[2.3]

	DBMS				
Plateau	POSTGRES (OODB)	frame sequence		:	VOD
VideoSTAR	Oracle (RDB) SHORE (OODB)	frame sequence		:	
OVID	Oracle (RDB) SHORE (OODB)	video object	video object 가	:	
VSDG		frame		:	
ADMIRE		frame		:	

2.4

XML

2.4.1

가

가

(features)

가

가

가

가

가

: 가

가

(high-level)

(domain knowledge)

가

가 (category),

(query by example)

(query by

sketch)

가

(similarity measurement)

가

(return)

IBM QBIC(Query By Image Content), VisualSEEK, JACOB(Just A Content

Based system), VideoQ

QBIC(Query By Image Content)

[23]

IBM Almaden

가

가

(storyboard)

가

VisualSEEK [24]

(feedback)

SAFE

VisualSEEk

CBVQ(Content-Based Visual Query)

JACOB(Just A Content Based system)[25]

database

population (, ,)

[26-30] VideoQ[31]

(animated sketch)

(visual sketch)

가

가

가

가

, , ,

2.4.2

XML

가

(similarity)

(measurement)

가

(angle)

(scale)가

가

가

가

XML

XML

가

[31],

(filtering)

가

,

가

가 . ,

가 ,

XSL(eXtensible Stylesheet

Language)

[32].

가

(format)

XML

. [2.4]

XML

[2.4]

XML

	가		
QBIC	(example) , (sketch)	database population ()	➤ 가
Visual-SEEK		color set back-projection [24]	➤
JACOB	, (motion)	database population (, ,)	➤ 가
VideoQ		(trajectory) (spatial)	➤ 가 ➤
XML	,		➤ , 가 가

III.

,

(domain)

XML DTD

3.2

(raw data)

XML 가 가

(scene)

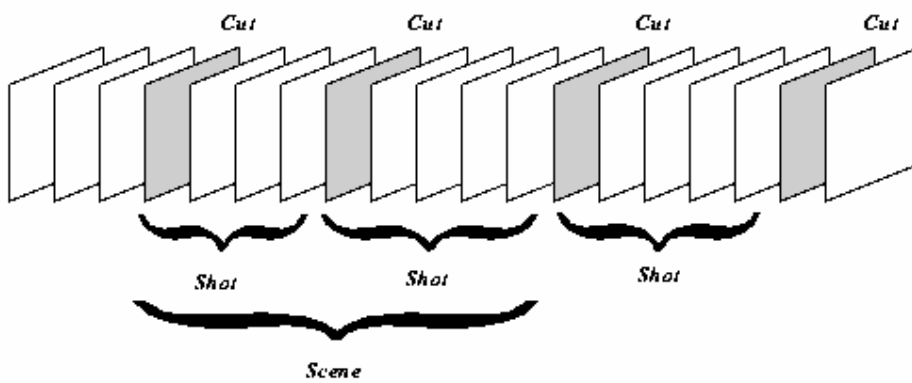
(shot)

(cut)

가

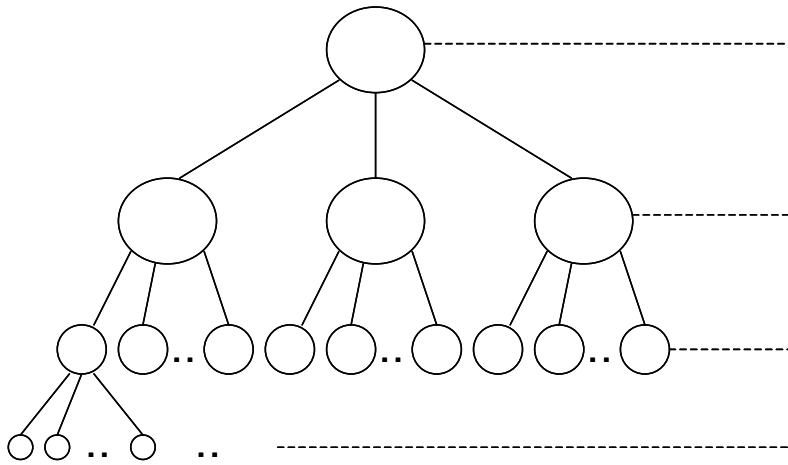
- (object) :
- (shot) :
- (scene) :
- (sequence) :
- (video) :

3.1



가

3.2



[3.2]

3.3

3.3.1

가

3.1

(bibliography)

가

[3.2]

			(title)
			(/ / / / / / / / / / / / / / /SF)
			가
			가
		가	가
			(6가)
			1. General(G) :
			2. Parental Guidance (PG) :
			3. 15A : 15 가
			4. 18A : 18 가
			5. Restricted (R) :
			6. Adult (A) : 가

3.3.2

3.3.4

3.5

[3.5]

	*	()
	*	
	*	
	*	
	*	
	*	
	*	

*

가

가 가

10 , 20

가

3.4 XML

XML DTD
XML DTD
XML DTD

3.4.1 XML DTD

가
XML DTD

- (extensibility)
XML DTD
- (compatibility)
XML DTD
- : / (Element/Attribute)
(tag)
XML DTD
- :
XML DTD
- : , (tree)
XML DTD

3.4.2 XML DTD

3.2 3.3 XML
DTD 가 XML
XML 가 3.3

```
<?xml VERSION="1.0" encoding="UTF-8"?>
```

```
<!ELEMENT DB ( * )>
```

```
<!-- -->
```

```
<!ELEMENT ( *, *)>
```

```
<!ELEMENT ( , , , , +, * , * , * , * , * , ? , * , , )>
```

```
<!ELEMENT ( * )>
```

```
<!-- -->
```

```
<!ELEMENT ( ? , * )>
```

```
<!ELEMENT ( , , , , , , , ? , ? , ? )>
```

```
<!ELEMENT ( DB )>
```

```
<!ELEMENT DB ( * )>
```

```
<!ELEMENT ( ? , * )>
```

```
<!-- -->
```

```
<!ELEMENT ( , , , , ? , , , * , * , * , ? , ? , ? , * , * , * , * , ? )>
```

```
<!ELEMENT ( , * )>
```

```
<!ELEMENT ( ? , ? , ? , ? , * , * )>
```

```
<!ELEMENT ( * , * , * , * , * )>
```

-
-
-
-

DTD

3.4

```

<!--          -->

<ELEMENT      ( , , , , , +, *,
*, *, *, *, *, ?, *, , )>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      ( ?, *, *, 가*, *)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      가 (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>
<ELEMENT      (#PCDATA)>

<!--          -->

<ELEMENT      ( *)>

```

```

<video - common>
<number>V#1</number>
<title>JSA</title>
<movie>JSA1.asf</movie>
<movie>JSA2.asf</movie>
<picture>jsa.jpg</picture>
<genre>      </genre>
<genre>      </genre>
<director>    </director>
<scenario>    </scenario>
<scenario>    </scenario>
<scenario>    </scenario>
<scenario>    </scenario>
<cameraman>   </cameraman>
<light>      </light>
<editing>    </editing>
<art>        </art>
<music>      </music>
<music>      </music>
<make>
  <year>2000</year>
  <person>    </person>
  <person>    </person>
  <company>   </company>
  <country>   </country>
  <language>  </language>
</make>
<casting>    </casting>
.....
<rank>15A</rank>
</video - common>

```



```

<!-- -->

<!ELEMENT      (      ?,      *)>
<!ELEMENT      (      ,      ,      ,      ?,
      ?,      ?,      ?,      ?)>>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!ELEMENT      (#PCDATA)>
<!-- -->

<!ELEMENT      (      DB)
<!ELEMENT      DB (      *)>
<!ELEMENT      (      ?,      *)>
    
```

```

<!-- -->

<!ELEMENT ( , , ? , )
           * , * , ? , ? , ? ,
           * , * , * , * , ? )>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT ( , , *)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT ( ? , ? , ? )>
<!ELEMENT (#PCDATA)>
<!ELEMENT ( , )>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>
<!ELEMENT (#PCDATA)>

<!-- -->

<!ELEMENT ( *)>
<!ELEMENT ( ? , *)>
    
```

```

<!--          -->

<ELEMENT          ( ?, , , , ?, ?)
  ?, *, *)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          ( ?, ?, ?, ?)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          ( ?, ?, ?, ?)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>

<!--          -->

<ELEMENT          ( *, *, *, *, *)>
<ELEMENT          ( ?, ?*)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          ( ?, ?)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          ( ?, ?, ?, ?, *)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>
<ELEMENT          ( *, *)>
<ELEMENT          (#PCDATA)>
<ELEMENT          (#PCDATA)>

```

3.5

3.4

XML DTD

XML

가
가 XML

가

(function)

3 가

-
-
-

가

가

가

5가

- ,
-
-
-
-
-
- ,
- ,

5가

-
-
-
-
-

5가

-
-
-
-
-

3.6

XML

, O

가

, A

가

가

, X

가

[3.6]

	O	A	O	O	O
	A	A	A	A	A
	O	A	O	O	O
	X	X	X	X	X

- O: 가
- A: 가 가
- X: 가

IV.

XML eXcelon

4.1

4.1

Windows 2000

XML

Object Design

eXcelon

eXcelon XML

XML

XML 가

, XML

가

가

(Cache-Forward)

(Multi-Tier)

[33, 34].

[4.1]

	Windows 2000 Server
XML data Server	Object Design eXcelon 2.1 Server
	Internet Information Server 4 (IIS4)
	Microsoft Internet Explorer 5.0
	XML Query Language (XQL) eXtensible Stylesheet Language (XSL) Active Server Page (ASP) JavaScript Microsoft Visual InterDev

Internet Information Server 5 (IIS 5)

XML

5.0

XQL

XQL

COM API

ASP

. XQL

XSL

[10, 22].

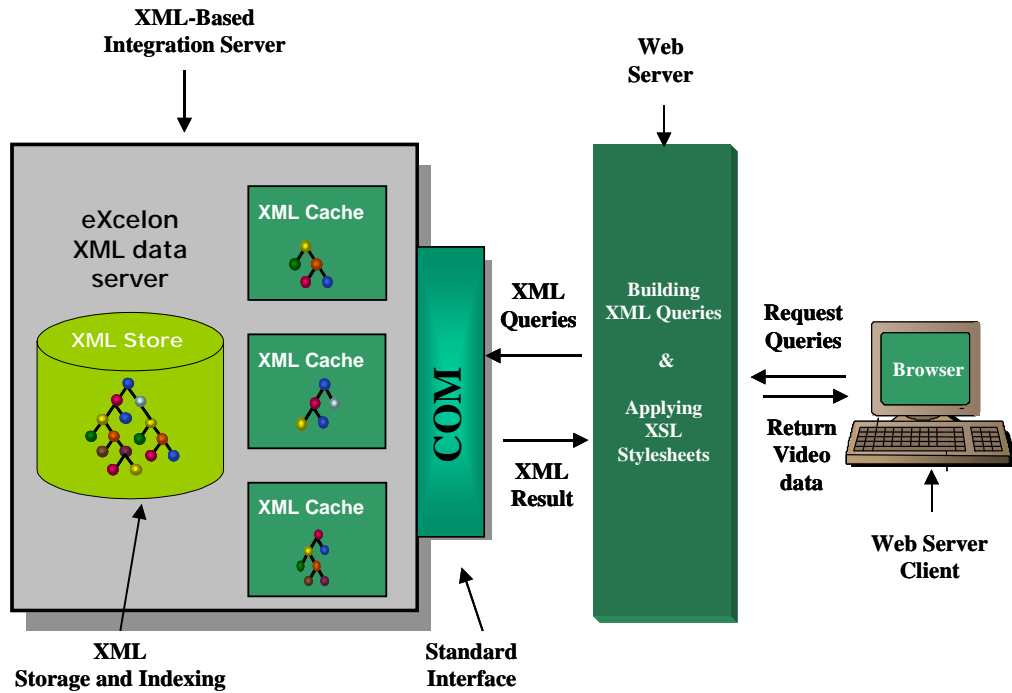
4.2

4.1

가

XML

가 COM 가 , XQL 가 .
 가 , , XML
 XQL COM XML
 eXcelon .
 XML COM XSL
 Stylesheet 가 HTML .
 가 .



[4.1]

4.3 eXcelon COM Client API

4.2

eXcelon COM Client API

Server	Page(ASP)	eXcelon	COM Client API	Active
	(Application)	ASP	eXcelon	
● 1	: XML	(XMLStores)	3	(Session)
● 2	: XML	(Query)		
● 3	: XML	XSL		

4.3.1

eXcelon (client application) XML
 가 XML

XMLStores . , eXcelon (store), (query),
 (move), (update) .
 4.2 .

```

Function GetSession()
  on error resume next
  dim sess, fact
  set sess = Application("eXcelon")
  if (typename(sess) <> "IXInSession")
    set fact = Server.CreateObject("ODI.eXcelon")
    set sess = fact.GetSession("",0)
    set Application("eXcelon") = sess
  end if
  set getSession = sess
end function
  
```

[4.2]

object

COM Client API

Client Object

. . Empty default .

4.3.2 XML

eXcelon Client API IXInSession4.Query()

(method) . 4.3 Query 4.2

, IXInSession , Query() . XQL

eXcelon , XQL XML . XML

```

dim sess, res
set sess = getSession()
set res = sess.Query(videos:/videodata/videos.xml, QueryString)
  
```

[4.3] XML

eXcelon XMLStore videos videosdata videos.xml
XML QueryString XQL
res , XML 가
4.4 “ 가 ”

XML

```
<?xml version="1.0" encoding="UTF-8" ?>
<xlnxql:result xlnxql:query="/videos/video/video-common[genre=' ' $and$
director=' ']/"lnxql:count="1" xmlns:xlnxql="http://www.ObjectDesign.com
/eXcelon/namespaces/query">
<video-common>
<number>V#1</number>
<title>JSA</title>
<movie>JSA1.asf</movie>
<movie>JSA2.asf</movie>
<picture>jsa.jpg</picture>
<genre> </genre>
<genre> </genre>
<director> </director>
.....
<make>
<year>2000</year>
<person> </person>
<person> </person>
<company> </company>
<country> </country>
<language> </language>
</make>
<casting> </casting>
<casting> </casting>
<casting> </casting>
<casting> </casting>
<casting> </casting>
<runtime>120</runtime>
<rank>15A</rank>
</video-common>
</video-common>
</xlnxql:result>
```

4.3.3 XSL

XQL XML HTML
 XSL Stylesheet . 4.5 4.4 XSL

```
call sess.transform(res.data, videos:/videosdata/videos_view.xml", "", "")
```

[4.5] XSL

transform() eXcelon XMLStore videos videosdata XSL
 videos_view.xml XML .
 XQL XML XML , 가
 XML HTML
 . XSL XML , XML
 (attribute) (font) XML
 HTML XML , 가
 4.2 가
 XSL XML
 , XQL 가 XQL
 eXcelon XML
 [4.2] XSL

XSL	
videos_view.xml	Stylesheets , , ,
videos_details.xml	Stylesheets , , ,
scenes_view.xml	Stylesheets , ,
scenes_details.xml	Stylesheets , ,

videos_view.xml XSL Stylesheet .
 , , , 가
 asf 가 . 4.6

videos_view.xml . videos_view.xml “ 가
 ” XQL 4.7 HTML
 . XSL 4.8 .
 videos_details.xml
 . 4.9 4.8 .
 scenes_view.xml XSL Stylesheet .
 , , , , 가
 . asf
 . scenes_details.xml
 .

```

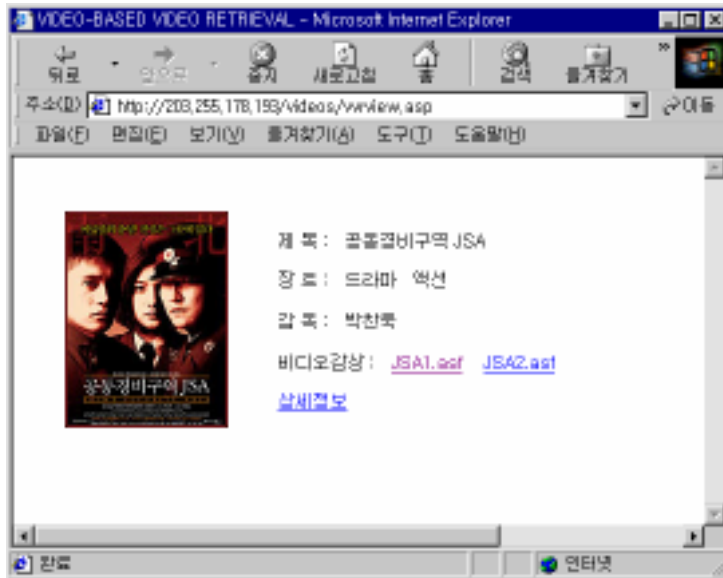
<?xml version="1.0" encoding="UTF-8" ?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/XSL/Transform">
<xsl:output method="html"/>
<xsl:variable name="qry" expr="/videos/video/video-common"/>
<xsl:template match="/">
<HTML><BODY>
<DIV STYLE="padding:.3in .1in .3in .3in;">
<xsl:for-each select="$qry"><P></P>
<TABLE align="center" border="0" width="800" height="21" cellspacing="3" cellpadding="3"
bordercolor="#FFDD62" style="font:13pt. Verdana;">
<TR align="center"><TD align="center" width="100">
<xsl:choose>
<xsl:when test="picture">
<IMG src="../../Scripts/xlnisapi.dll/videos/videosdata/images /{picture}" border="1" />
</xsl:when>
</xsl:choose></TD><TD>
<TABLE align="left" border="0" width="400" height="21" cellspacing="3"
cellpadding="3" bordercolor="#FFDD62" style="font:10pt. Verdana;">
<TR align="left">
<TD width="80" height="13" > :</TD>
<xsl:for-each select="title">
<TD width="60"> <xsl:value-of select="."/></TD>
</xsl:for-each>
</TR>
.....
</TABLE></TD></TR></TABLE>
</xsl:for-each>
</DIV>
</BODY>
</HTML>
</xsl:template>

```

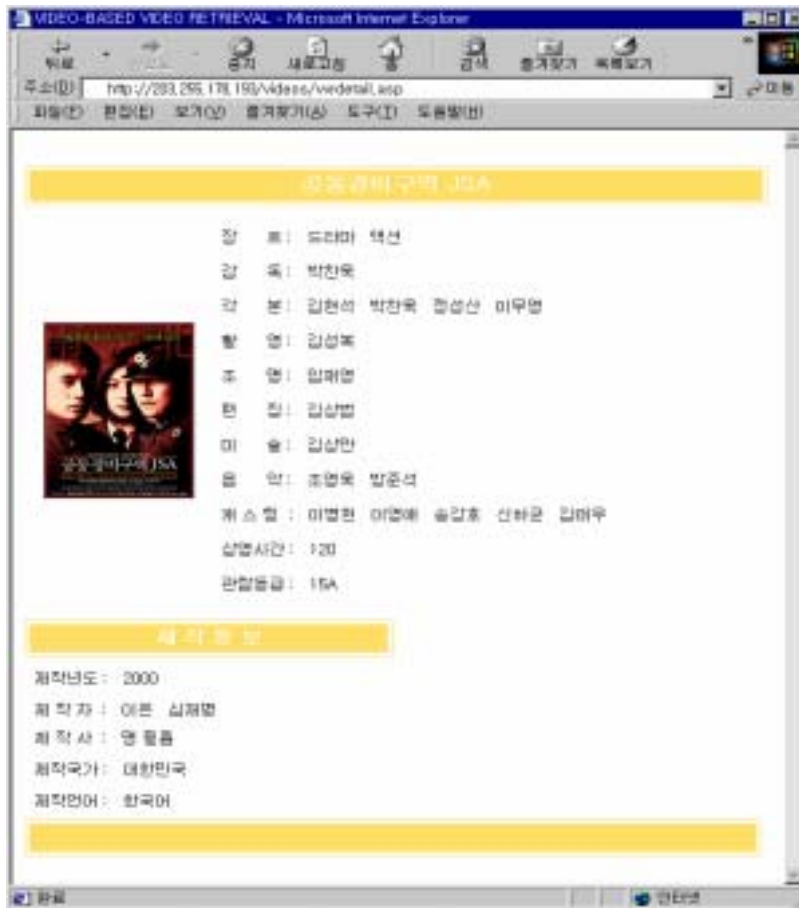
```

<HTML>
<BODY>
<DIV STYLE="padding:.3in .1in .3in .3in;"> <P></P>
<TABLE align="center" border="0" width="800" height="21" cellspacing="3" cellpadding="3"
bordercolor="#FFDD62" style="font:13pt. Verdana;">
<TR align="center">
<TD align="center" width="100">
<IMG src="..Scripts/videos/videosdata/images/jsa.jpg" border="1"></TD>
<TD>
<TABLE align="left" border="0" width="400" height="21" cellspacing="3" cellpadding="3"
bordercolor="#FFDD62" style="font:10pt. Verdana;">
<TR align="left"><TD width="80" height="13">          :</TD><TD width="60">JSA
</TD></TR>
<TR align="left"><TD width="80" height="13">          :</TD><TD width="60">
</TD><TD width="60">      </TD></TR>
<TR align="left">
<TD width="80" height="13">          :</TD><TD width="60">      </TD></TR>
<TR align="left"><TD width="80" height="13">          :</TD>
<TD align="left" style="font-family: Verdana;">
<a href="http://203.255.178.193/Scripts/xlnisapi.dll/videos/videosdata
/movies/JSA1.asf">JSA1.asf</a>
</TD>
.....
</TR>
</TABLE>
<P></P>
</TD>
</TR>
</TABLE>
</DIV>
</BODY>
</HTML>

```



[4.8] XSL



[4.9] 4.8

4.4 XQL

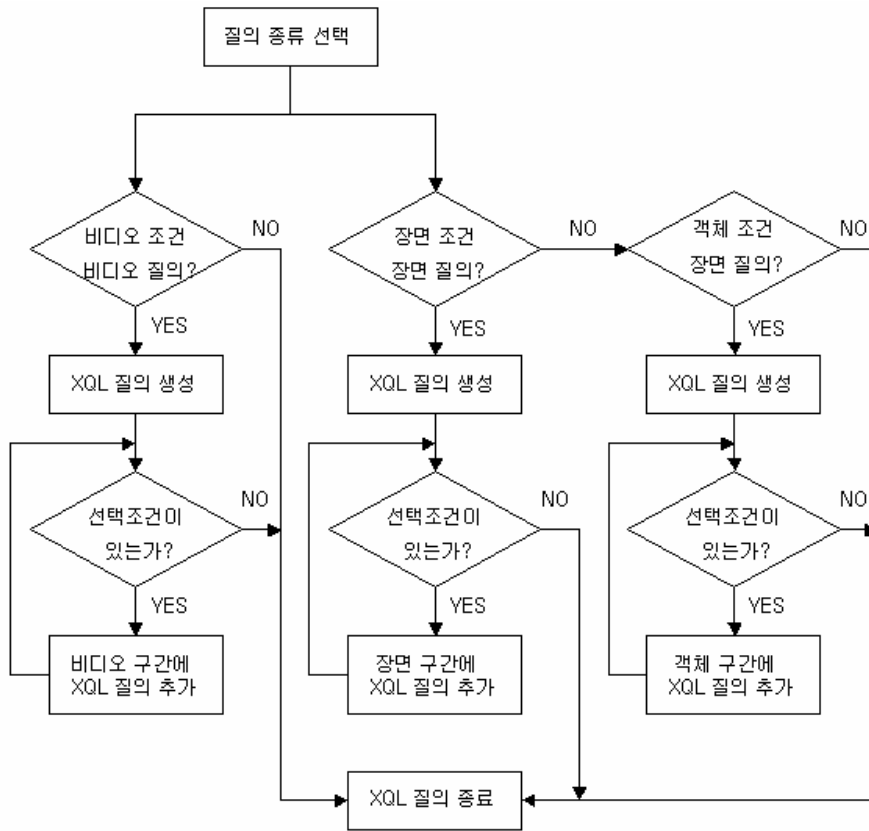
eXcelon

가

XQL

가

XQL



[4.10]

4.5

XML

가

XML (element)

가

XML

excelon

COM Client

API

가

XQL

, COM Client API eXcelon .

XSL

Stylesheet

가

가

, 가
3.5

4가

-
-
-
-

4.5.1

(Clip)

(title), (genre),

(director), (scenario)

4.11

XQL

```
[ Ex 1 ]
" 2000 가
"
[ XQL Q1 ]
/videos/video/video-common[genre = " " $and$ director = " " $and$ make-
information/year = "2000" $and$ casting = " " ]
```

[4.11] Ex 1 XQL Q1

Q1

. XQL XML

(filtering)

4.12

가 “ ”,

“ ”, 가 “ 2000 ” , “ ”



[4.12]

4.5.2

4.13

XQL

```
[ Ex2 ]
" JSA
"

[ XQL Q2 ]
/videos/video/video - each/sequences/sequence - each/scenes/scene/scene - common[video -
title= " JSA" $and$ representation = "
$and$ time - information/time - class = " " $and$ place = "
"]
```

[4.13] Ex 2 XQL Q2

Q2

“ JSA ”
“ ”, 가 “ ”, “ ”

4.14



[4.14]

4.5.3

가

4.15

XQL

```

[ Ex3 ]
“ JSA ” 20
”

[ XQL Q3 ]
/videos/video/video-each/sequences/sequence-each/scenes/scene[scene-common/video-
title = " JSA" $and$ scene-each/scene-common-object/sex = " " $and$
scene-each/scene-common-object/role = " " $and$ scene-each/scene-common-
object/age-information/s_class = "20 " $and$ scene-each/scene-common-object/job-
information/job-name = " " $and$ scene-each/scene-common-object/job-
information/job-class = " " $and$ scene-each/scene-each-object/hair-information/style =
" " $and$ scene-each/scene-each-object/action-information/when = " "]

```

[4.15] Ex 3 XQL Q3

Q3

“ JSA ”
“ ” , “ ” “ ” ,
“ 20 ” , “ ” , “ ” “ ” “ ”



[4.16]

4.5.4

가

[Ex4]

" JSA

20

[XQL Q4]

```

/videos/video/video-each/sequences/sequence-each/scenes/scene[scene-common/video-title =
" JSA" $and$ scene-common/representation = " " $and$ scene-common/time-
information/time-class = " " $and$ scene-common/place = " " $and$ scene-each/scene-
common-object/sex = " " $and$ scene-each/scene-common-object/role = " " $and$
scene-each/scene-common-object/age-information/s_class = "20 " $and$ scene-each/scene-
common-object/job-information/job-name = " "$and$ scene-each/scene-common-
object/job-information/job-class = " " $and$ scene-each/scene-each-object/ action-
information/where = " " $and$ scene-each/scene-each-object/
action-information/action = " "]
    
```

[4.17]

Ex 4

XQL

Q4

Q4

가

(composite query)

“ JSA ”

“ ”, “ 20 ”, “ ”,

4.18



[4.18]

4.19

1

가

4.20,

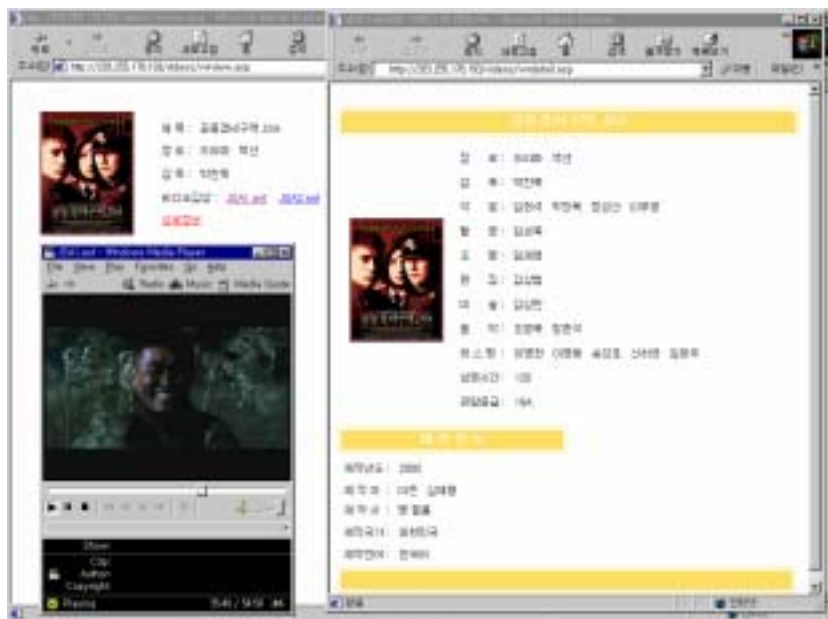
4.21,

4.22

2,

3,

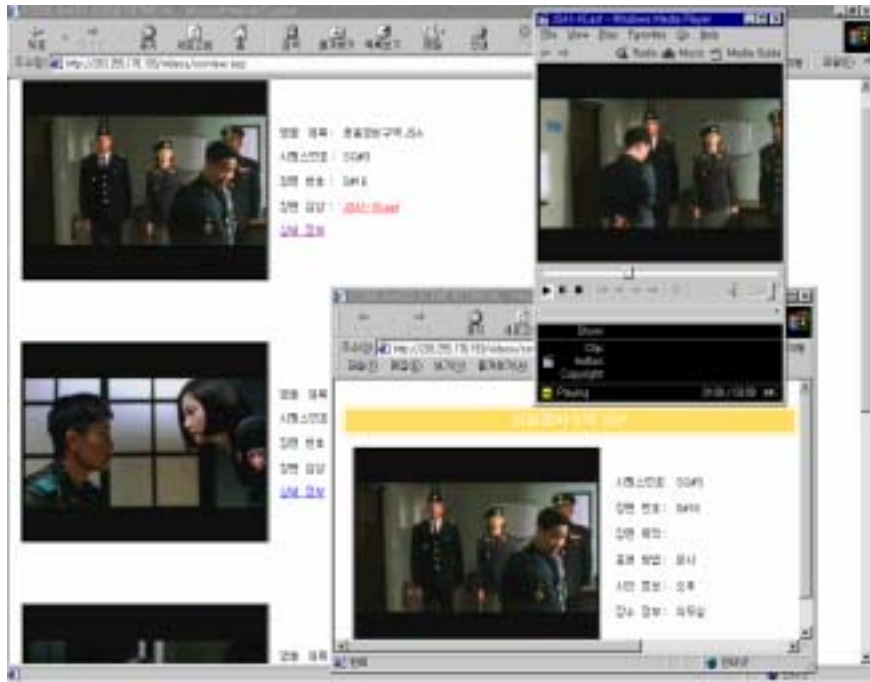
4



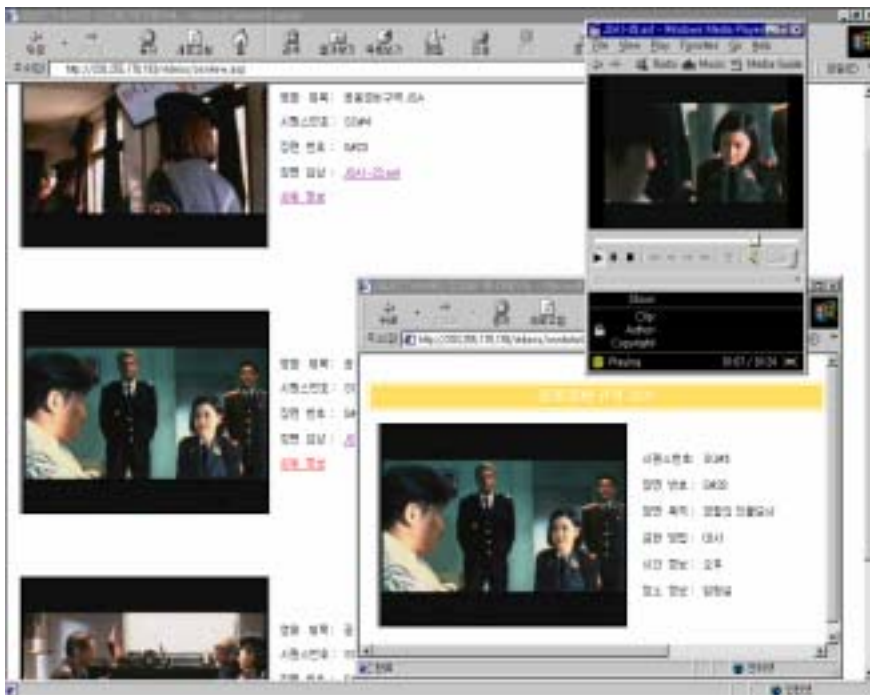
[4.19]

1

가



[4.20] 2 ,



[4.21] 3 ,

V.

MPEG

asf, rm

, 가
(clipping)

6700

, 가 (www.google.com)

, 가

가

가 , QBIC, VisualSEEK,

JACOB, VideoQ

가

가

XML

XML

XML

가

XML

eXcelon

가

가

가

XSL

HTML

- XML

- 가 XML 가
[31],

- XML eXcelon XML 가 ,

- XSL 가 (format)

(domain) ,

XML , ,

, ,

.

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