

Transforming and enhancing metadata for enduser discovery: a case study

Edward M. Corrado
Director of Library Technology
ecorrado@binghamton.edu

Rachel Jaffe
Metadata Catalog Librarian
rjaffe@binghamton.edu

BINGHAMTON
UNIVERSITY
STATE UNIVERSITY OF NEW YORK



Binghamton University (SUNY)

Binghamton University, one of four comprehensive doctoral research universities within the State University of New York, is recognized for stellar academics, an international focus, high graduation rates and overall value.

- Undergraduates: 12,356
- Graduate students: 2,952
- Average SAT score range: 1220-1385
- Average ACT score range: 27-30
- Top 25% of high school class: 87.9%
- In the past 10 years, 91% of freshmen returned for their sophomore year
- Students of color: 28%
- International students: 15%

Students come from 45 states and 100 countries



Digital Preservation & Resource Discovery @ Binghamton

Primo

Discovery Layer

Rosetta

Digital
Preservation
System

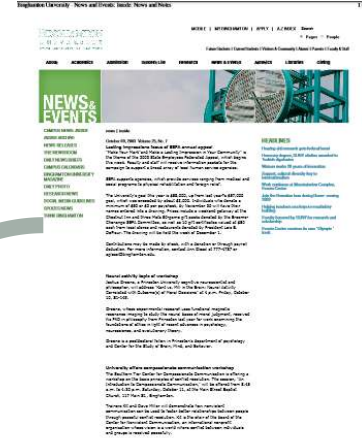
Primo
Central

Aleph

ILS

Digital Projects @ Binghamton

Rosetta



Digital Projects @ Binghamton

Rosetta



Metadata



Metadata



Metadata

University Photographs Collection: University Photographer's Workflow



University Photographs Collection: University Photographer's Workflow

20091003_homecoming010_jwc.tif

Description IPTC Camera Data Video Data Audio Data Mobile SWF Categories Origin DICOM History Illustrator ▾

Document Title:

Author: JONATHAN COHEN

Author Title: UNIVERSITY PHOTOGRAPHER

Description: JONATHAN COHEN/BINGHAMTON UNIVERSITY
The Binghamton University student section cheers for the Men's Soccer team during a game with the University of Rhode Island,

Rating: ★ ★ ★ ★ ★

Description Writer: JC

Keywords: 2009; events; on campus; homecoming; fans; students; spectators; soccer; varsity; mens; athletics; cheer; celebrate; scream

i Semicolons or commas can be used to separate multiple values

Copyright Status: Copyrighted ▾

Copyright Notice: JONATHAN COHEN/BINGHAMTON UNIVERSITY

Copyright Info URL:

Created: 10/4/2009 - 10:17 AM Application: Adobe Photoshop CS3 Macintosh
Modified: 10/4/2009 - 10:17 AM Format: image/tiff

Powered By **xmp**

▾

Overview of the Libraries' Workflow

Initial Set-up

Metadata Librarian

Evaluate embedded metadata; determine DC mappings & fields to be added

Create metadata form and DC mapping table in the preservation system; create keyword & creator mapping tables

Identify new keywords to be mapped; update keyword mapping table

Review & approve metadata

Write shell scripts to extract keywords & other metadata created by photographer

Write shell scripts to transform & map embedded metadata

Run scripts, output DC metadata as CSV file

Receive photographs

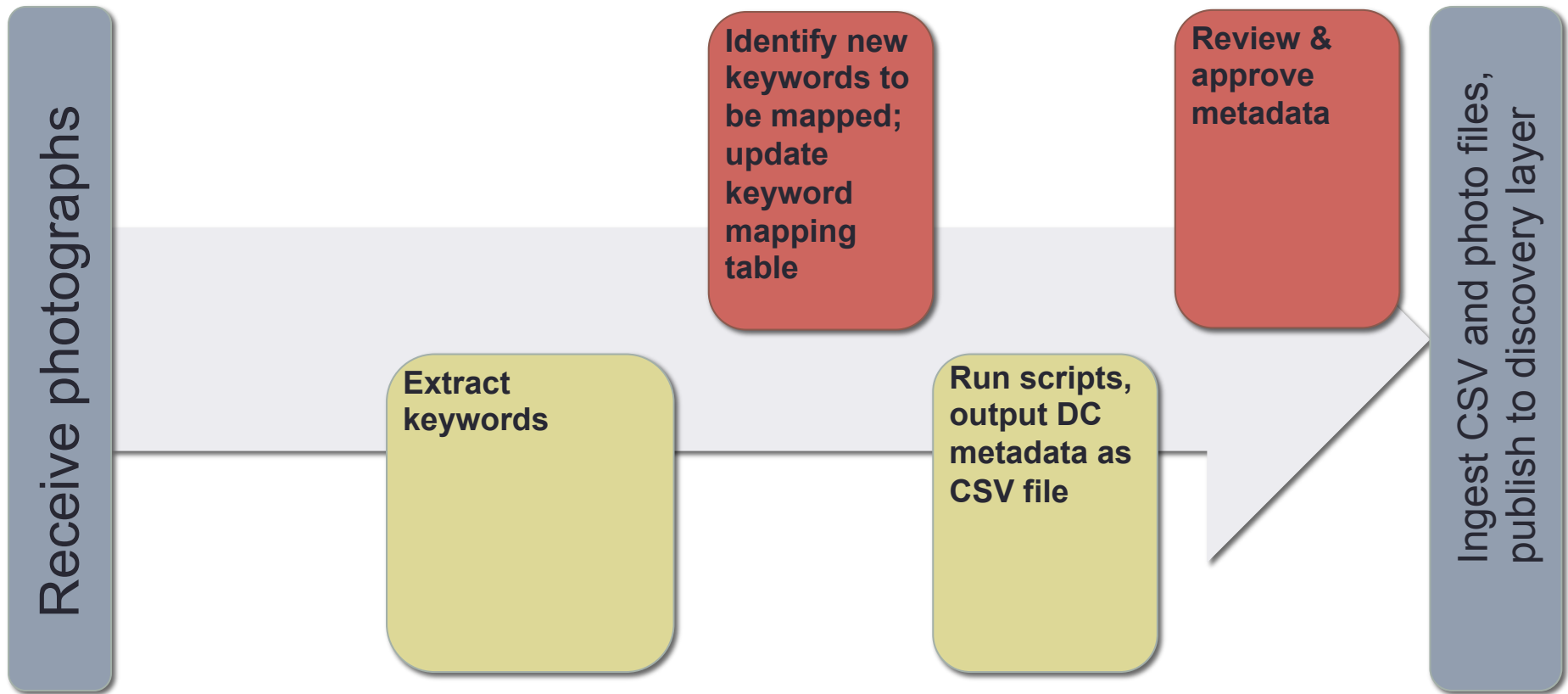
Ingest CSV and photo files; publish to discovery layer

Director of Library Technology

Overview of the Libraries' Workflow

Subsequent Loads

Metadata Librarian



Director of Library Technology

Extracting, Evaluating and Transforming Metadata

```
ecorrado@ecorrado: ~/exlibris/rosetta/university_photo/cumulus
ecorrado@ecorrado:~/exlibris/rosetta/university_photo/cumulus$ exiftool -X -XMP-dc:* -XMP-photoshop:* 20091003_homecoming010_jwc.tif
<?xml version='1.0' encoding='UTF-8'?>
<rdf:RDF xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#'>

<rdf:Description rdf:about='20091003_homecoming010_jwc.tif'
  xmlns:et='http://ns.exiftool.ca/1.0/' et:toolkit='Image::ExifTool 8.60'
  xmlns:XMP-dc='http://ns.exiftool.ca/XMP/XMP-dc/1.0/'
  xmlns:XMP-photoshop='http://ns.exiftool.ca/XMP/XMP-photoshop/1.0/'>
  <XMP-dc:Format>image/tiff</XMP-dc:Format>
  <XMP-dc:Rights>JONATHAN COHEN/BINGHAMTON UNIVERSITY</XMP-dc:Rights>
  <XMP-dc:Subject>
  <rdf:Bag>
    <rdf:li>2009</rdf:li>
    <rdf:li>events</rdf:li>
    <rdf:li>on campus</rdf:li>
    <rdf:li>homecoming</rdf:li>
    <rdf:li>fans</rdf:li>
    <rdf:li>students</rdf:li>
    <rdf:li>spectators</rdf:li>
    <rdf:li>soccer</rdf:li>
    <rdf:li>varsity</rdf:li>
    <rdf:li>mens</rdf:li>
    <rdf:li>athletics</rdf:li>
    <rdf:li>cheer</rdf:li>
    <rdf:li>celebrate</rdf:li>
    <rdf:li>scream</rdf:li>
  </rdf:Bag>
  </XMP-dc:Subject>
  <XMP-dc:Description>JONATHAN COHEN/BINGHAMTON UNIVERSITY
  The Binghamton University student section cheers for the Men&#39;s Soccer team during a game with the University of Rhode Island,
  Saturday night, October 3, 2009. The game ended in a 1-1 tie.</XMP-dc:Description>
  <XMP-dc:Creator>JONATHAN COHEN</XMP-dc:Creator>
  <XMP-photoshop:ColorMode>RGB</XMP-photoshop:ColorMode>
  <XMP-photoshop:ICCPProfileName>Adobe RGB (1998)</XMP-photoshop:ICCPProfileName>
  <XMP-photoshop:Source>BINGHAMTON UNIVERSITY</XMP-photoshop:Source>
  <XMP-photoshop:Credit>JONATHAN COHEN/BINGHAMTON UNIVERSITY</XMP-photoshop:Credit>
  <XMP-photoshop:Country>USA</XMP-photoshop:Country>
  <XMP-photoshop:State>NY</XMP-photoshop:State>
  <XMP-photoshop:City>VESTAL</XMP-photoshop:City>
  <XMP-photoshop:DateCreated>2009:10:03</XMP-photoshop:DateCreated>
  <XMP-photoshop:CaptionWriter>JC</XMP-photoshop:CaptionWriter>
  <XMP-photoshop:AuthorsPosition>UNIVERSITY PHOTOGRAPHER</XMP-photoshop:AuthorsPosition>
  <XMP-photoshop:History></XMP-photoshop:History>
</rdf:Description>
</rdf:RDF>
ecorrado@ecorrado:~/exlibris/rosetta/university_photo/cumulus$
```

Extracting, Evaluating and Transforming Metadata

XMP Metadata Fields	Map To Dublin Core Field	Default Value(s)
	dc:title	Homecoming 2009
	dcterms:isPartOf	Binghamton University Photographs
	dcterms:isPartOf	Binghamton University 2009 Homecoming Photos
	dc:publisher	State University of New York at Binghamton
	dc:rightsHolder	State University of New York at Binghamton
	dcterms:license	http://library.binghamton.edu/technology/policies/university_photographs.html
	dc:type	Image
	dcterms:modified	<i>* Enter YYYY-MM-DD for date the photos are ingested.</i>
XMP-dc:Format	dcterms:medium	
XMP-dc:Creator	dc:creator	
XMP-dc:Creator	dc:rightsHolder	
XMP-Photoshop:DateCreated	dcterms:created	
XMP-dc:Description	dc:description	
XMP-dc:Subject	dc:subject	
XMP-dc:Subject	dc:subject@xsi:type="dcterms:LCSH"	State University of New York at Binghamton-- Pictorial works ; Universities and colleges--New York (State)--Binghamton--Pictorial works
XMP-dc:Subject	dc:subject@xsi:type="dcterms:TGM"	
XMP-dc:Subject	dcterms:spatial	
	dc:identifier	

```

ecorrado@ecorrado:~/exlibris/rosetta/university_photo/cumulus
tif
<?xml version='1.0'
<rdf:RDF xmlns:rdf=
<rdf:Description rd
xmlns:et='http://
xmlns:XMP-dc='http
xmlns:XMP-photosh
<XMP-dc:Format>Imag
<XMP-dc:Rights>JON
<XMP-dc:Subject>
<rdf:Bag>
<rdf:li>2009</rd
<rdf:li>events</
<rdf:li>on campus
<rdf:li>homecomi
<rdf:li>fans</rd
<rdf:li>students
<rdf:li>spectator
<rdf:li>soccer</
<rdf:li>varsity<
<rdf:li>mens</rd
<rdf:li>athletic
<rdf:li>cheer</r
<rdf:li>celebrate
<rdf:li>scream</
</rdf:Bag>
</XMP-dc:Subject>
<XMP-dc:Description
The Binghamton Univ
Saturday night, Oct
<XMP-dc:Creator>JON
<XMP-photoshop:Colo
<XMP-photoshop:ICC
<XMP-photoshop:Sou
<XMP-photoshop:Crea
<XMP-photoshop:Cour
<XMP-photoshop:Sta
<XMP-photoshop:Ci
<XMP-photoshop:Dat
<XMP-photoshop:Cap
<XMP-photoshop:Aut
<XMP-photoshop:His
</rdf:Description>
</rdf:RDF>
ecorrado@ecorrado:~

```

Keywords → Subject Headings

```
events>homecoming 2009
161 2009
152 on campus
152 events
146 homecoming
101 alumni
  52 events center
  52 ec
  39 fine arts building
  39 fa
  35 memorial
  29 students
  28 wine
  28 party
  28 cheese
```

Keywords → Subject Headings

```
events>homecoming 2009  
161 2009  
152 on campus  
152 events  
146 homecoming  
101 alumni  
52 events center  
52 ec  
39 fine arts building  
39 fa  
35 memorial  
29 students  
28 wine  
28 party  
28 cheese
```

Keywords → Subject Headings

```
events>homecoming 2009
161 2009
152 on campus
152 events
146 homecoming
101 alumni
  52 events center
  52 ec
  39 fine arts building
  39 fa
  35 memorial
  29 students
28 wine
28 party
28 cheese
```

Events (dcterms:TGM)

Class reunions--New York (State)--
Binghamton (dcterms:LCSH)

State University of New York at
Binghamton--Alumni and alumnae
(dcterms:LCSH)

Events Center (dcterms:spatial)

Fine Arts Building (dcterms:spatial)

Fine Arts Building. Memorial
Courtyard (dcterms:spatial)

State University of New York at
Binghamton--Buildings
(dcterms:LCSH)

State University of New York at
Binghamton--Students
(dcterms:LCSH)

Keywords → Subject Headings

events>homecoming 2009

~~161 2009~~

~~152 on campus~~

152 events

146 homecoming

101 alumni

52 events center

52 ec

39 fine arts building

39 fa

35 memorial

29 students

~~28 wine~~

~~28 party~~

~~28 cheese~~

Events (dcterms:TGM)

Class reunions--New York (State)--
Binghamton (dcterms:LCSH)

State University of New York at
Binghamton--Alumni and alumnae
(dcterms:LCSH)

Events Center (dcterms:spatial)

Fine Arts Building (dcterms:spatial)

Fine Arts Building. Memorial
Courtyard (dcterms:spatial)

State University of New York at
Binghamton--Buildings
(dcterms:LCSH)

State University of New York at
Binghamton--Students
(dcterms:LCSH)

Keywords → Subject Headings

	A	B	C	D
1	Keywords <dc:subject>	LCSH <dc:subject@xsi:type="dcterms:LCSH">	TGM <dc:subject@xsi:type="dcterms:TGM">	Coverage Spatial <dcterms:spatial>
73	ciw	State University of New York at Binghamton--Student housing		College in the Woods
74	<i>college of community and public affairs</i>	State University of New York at Binghamton. College of Community and Public Affairs		
75	ccpa	State University of New York at Binghamton. College of Community and Public Affairs		
76	<i>commencement</i>	Commencement ceremonies--New York (State)--Binghamton		
77	graduation	Commencement ceremonies--New York (State)--Binghamton		
78	computer science	State University of New York at Binghamton. Dept. of Computer Science		
79	construction	State University of New York at Binghamton--Buildings		
80	<i>council for higher education accreditation</i>	Council for Higher Education Accreditation (U.S.)		
81	chea	Council for Higher Education Accreditation (U.S.)		
82	<i>couper administration building</i>	State University of New York at Binghamton--Buildings		Couper Administration Building
83	couper	State University of New York at Binghamton--Buildings		Couper Administration Building
	courtyard			Fine Arts Building. Memorial Courtyard

Technical Details: Shell Scripts


Key tools:

- **exiftool**
- **awk**
- **sed**
- **echo**

```
# Extract all appropriate Metadata for all files and write to $TEMPFILE
exiftool -T -filename -FileType -Format -DateCreated -ImageSize /
  -XMP-dc:Creator -XMP-dc:Description -XMP-dc:Subject /
  $IMAGES >> $TEMPDIR/"$TEMPFILE
```


Making a Deposit

	A	B	C	D	E	F	G	H	I	J	K	
1	Object Type	Title	Collection	Sub-Collection	Digital Publisher	License	Material Type	Identifier	Digital Format	Date Created	Date Digital	Description
2	SIP	Homecoming 2009 Load										
3	IE	Homecoming 2009	Binghamton University Photographs	Binghamton University 2009 Homecoming	State University of New York	http://library.binghamton.edu	Image	20091002_alumni	image/tiff	2009-10-02	2013-06-24	Award winners, Photographs
4	Representation											
5	File											
6	IE	Homecoming 2009	Binghamton University Photographs					002_alumni	image/tiff	2009-10-02	2013-06-24	School of Management
7	Representation											
8	File											
9	IE	Homecoming 2009	Binghamton University Photographs									
10	Representation											
11	File											
12	IE	Homecoming 2009	Binghamton University Photographs									
13	Representation											
14	File											
15	IE											
16	Representation											
17	File											
18	IE											
19	Representation											
20	File											
21	IE											
22	Representation											
23	File											
24	IE											
25	Representation											
26	File											
27	IE											
28	Representation											
29	File											
30	IE											
31	Representation											
32	File											
33	IE			2009 Homecoming	State University of New York	http://library.binghamton.edu	Image	20091002_bsufas	image/tiff	2009-10-02	2013-06-24	Black Student Union
34	Representation											
35	File											



CSV + images files → preservation system

Metadata Display



Metadata Display

Descriptive Metadata - IE DC

Title: Homecoming 2009
Creator: Cohen, Jonathan
Publisher: State University of New York at Binghamton
Subject (TGM): Spectators
Subject (TGM): Fans (Persons)
Subject (TGM): Events
Subject (LCSH): Class reunions--New York (State)--Binghamton
Subject (LCSH): Sports teams--New York (State)--Binghamton
Subject (LCSH): Cheerleading--New York (State)--Binghamton
Subject (LCSH): State University of New York at Binghamton--Soccer
Subject (LCSH): State University of New York at Binghamton--Sports
Subject (LCSH): State University of New York at Binghamton. Bearcat
Subject (LCSH): State University of New York at Binghamton--Pictoria
Subject (LCSH): Universities and colleges--New York (State)--Binghar
Subject (LCSH): State University of New York at Binghamton--Student
Subject: 2009
Subject: celebrate
Subject: athletics
Subject: on campus
Subject: scream
Subject: soccer



Subject: spectators
Subject: students
Subject: events
Subject: varsity
Subject: cheer
Subject: homecoming
Subject: fans
Subject: mens
Description: The Binghamton University student section cheers for the Men's Soccer team during a game with the University of Rhode Island, Saturday night, October 3, 2009. The game ended in a 1-1 tie.
Location: On-campus
Digital Format: image/tiff
Material Type: Image
Date Digital: 2013-06-24
Identifier: 20091003_homecoming010_jwc.tif
Collection: Binghamton University 2009 Homecoming Photos
Collection: Binghamton University Photographs
Date Created: 2009-10-03
License: http://library.binghamton.edu/technology/policies/university_photographs.html
Rights Holder: Cohen, Jonathan ; State University of New York at Binghamton

Questions?

- **Contact:** rjaffe@binghamton.edu
ecorrado@binghamton.edu
-

- **Special thanks to:**

Jonathan Cohen
University Photographer
Binghamton University