

Library Administration of Critical Research Infrastructure:  
Integrating a DSpace Repository & Research Information Management System  
Open Repositories, Denver, Colorado  
June 7, 2022

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Download slides: [osf.io/9xpaq](https://osf.io/9xpaq)

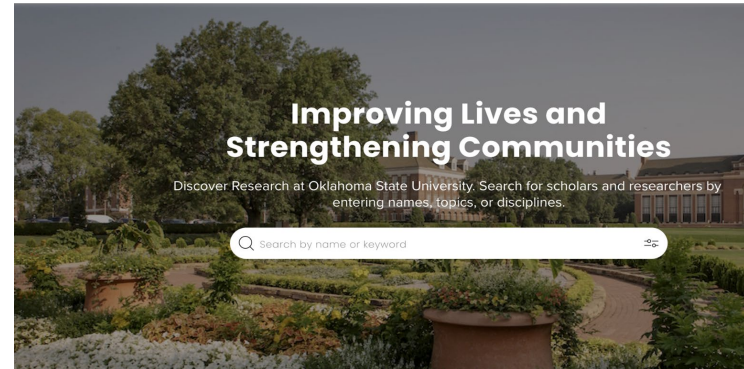


# Research Information Management Systems

- A Research Information Management System (RIM System, aka CRIS or FAR) is a software platform for the collection, storage, and linking together of metadata related to faculty service, grants, teaching, and scholarly activities.
- A single point of access for data typically spread across multiple internal and external platforms
- Profiles are private by default but can be toggled to public and displayed on a public profile website
- Helps researchers, funders, and members of the public identify expertise within the university, and enable faculty members to communicate their research focus and activities more effectively
- Saves time and increases the accuracy of university reporting

# RIM System Implementation at OSU

- Symplectic Elements implementation led by OSU Library from 2019 in partnership with IT and other university staff. We refer to Elements locally as **Experts Directory**.
- Publications metadata harvested from external platforms such as Scopus, Dimensions, Crossref, etc.
  - Faculty “claim” work based on author identifier or name searches
- Four other data feeds come from internal university sources:
  - Personnel information (Human Resources)
  - Grants (Office of Grants & Contracts Financial Administration)
  - Courses taught (Registrar)
  - **University scholarly & creative works (SHAREOK)**

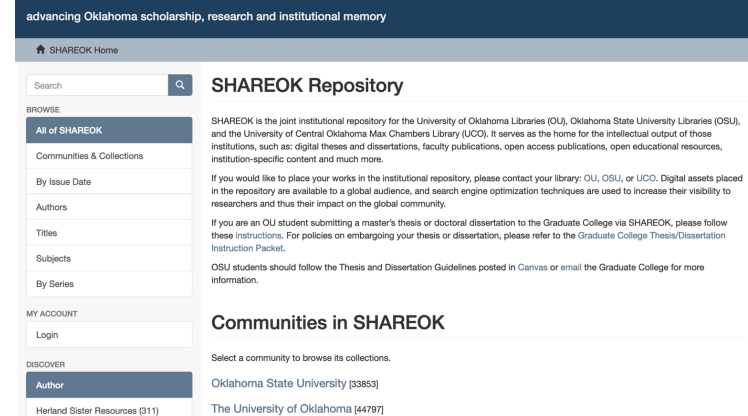


<https://experts.okstate.edu/>



# DSpace at OSU: SHAREOK

- Three universities/DSpace communities in the SHAREOK consortium
- Consortium impacts updates, system modifications, metadata
- DSpace 6; DSpace 7 anticipated in 2023
- Mediated deposits
- OSU Community Collections:
  - faculty papers, patents, conference proceedings, theses and dissertations, Ag Extension publications, etc



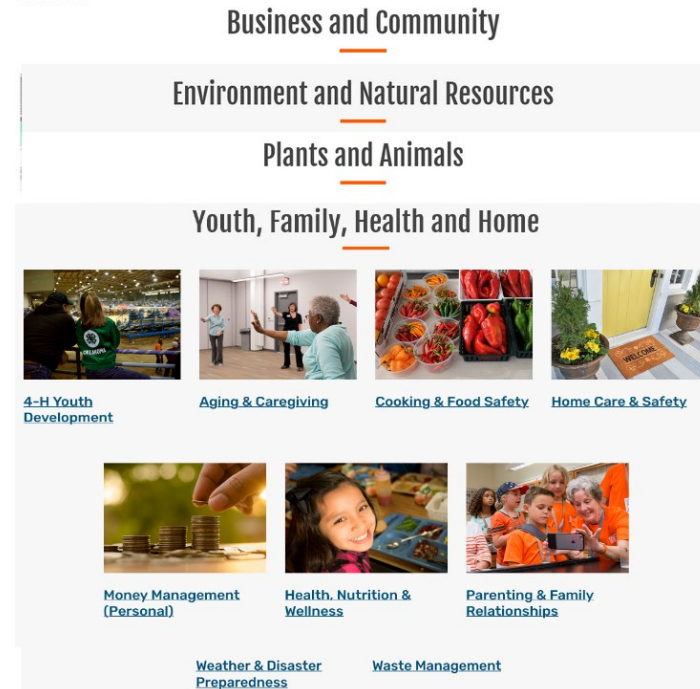
The screenshot shows the SHAREOK website interface. At the top, a dark blue header contains the text "advancing Oklahoma scholarship, research and institutional memory" and "SHAREOK Home". Below the header is a search bar with a magnifying glass icon. The main content area is divided into two columns. The left column has a "BROWSE" section with a blue button for "All of SHAREOK" and links for "Communities & Collections", "By Issue Date", "Authors", "Titles", "Subjects", and "By Series". Below this is a "MY ACCOUNT" section with a "Login" button. The right column features the "SHAREOK Repository" title, a paragraph describing the repository's mission, and a "Communities in SHAREOK" section with a "Select a community to browse its collections." prompt and two listed communities: "Oklahoma State University [33853]" and "The University of Oklahoma [44797]".

<https://shareok.org>



# Oklahoma Cooperative Extension Service

- “Ag Extension”: University/government effort to “extend” the university via science-based educational programs
- Topics from agriculture to youth development
- Numbered fact sheet series, agricultural experiment station research reports, newsletters
- As factsheets are updated and republished, authors change
- Published online





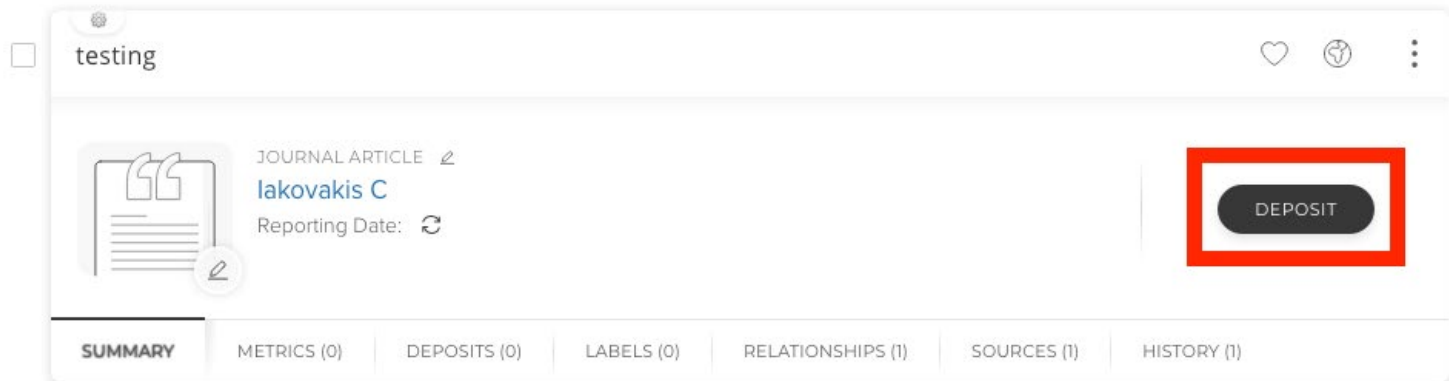
# Integration of Elements and DSpace

- The Scholarly Services position responsibilities include providing the OSU community with outreach and education on open access and the advantages of utilizing SHAREOK to archive and provide access to their work
- In 2021, the library initiated a project to integrate Elements and DSpace. We worked with Symplectic to guide the integration process and help construct the XML schema and crosswalk map files
- This integration works both ways:
  - **Deposit:** Allows researchers to deposit their work (articles, slides, posters, data, etc.) from Experts Directory to SHAREOK
  - **Harvest:** Imports metadata records already existing in SHAREOK, and allows researchers' to “claim” those records in their Experts Directory profiles.



# Integration of Elements and DSpace

- The integration of these systems reinforces Elements as a consistent, centralized, curated database of scholarly and creative works across the university
- Implementation took roughly 6 months, and the system went live in January 2022.
  - [SHAREOK deposit support page](#)



# Mapping Metadata: Crosswalk

OKSTATE Xwalk planner - Dspace Repository

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Underlying field in Elements	data type	Default field usage (typically the most common display name for the underlying field)	Direction <-> 2-way <- harvest --> deposit X no mapping columns to the right.	Default field mapping (repository field) This is the field mapping that will be used for all item types, unless a different mapping is explicitly specified for a particular type in the underlying columns to the right.	Elmts. Pub'n type / Repo. Item type Display names -> Identifiers -> No. of field usages Total :: Distinct	Elements Journal article	Repository Article	Elements Book	Repository Book	Elements Book chapter	Repository Book chapter	Elements Book review	Repository Book review	Elements Composition	Repository Composition
1	title	text	Title	<->	dc.title	29 :: 4	[as default]	[as default]	[as default]	[as default]	Chapter title	[use default ma	Book review title	[use default ma	[as default]	[as
2	abstract	text	Abstract	<->	[complex mapping - describe in a commen	26 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
3	authors	person-list	Authors	<->	[complex mapping - describe in a commen	29 :: 4	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[no mapping - €	[as default]	[as
4	author-uri	url	Author URL	-->	dc.relation.uri	28 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
5	editors	person-list	Editors	<->	dc.contributor.editor	8 :: 3	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
6	series	text	Series	<->	dc.relation.ispartofseries	5 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
7	edition	text	Edition	X	[no default mapping]	5 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
8	volume	text	Volume	X	[no default mapping]	7 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
9	pagination	pagination	Pagination	X	[no default mapping]	10 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
10	publisher	text	Publisher	<->	dc.publisher	14 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
11	publisher-uri	url	Publisher URL	-->	dc.relation.uri	23 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
12	place-of-publication	text	Place of publication	<->	dc.coverage.spatial	8 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
13	publication-date	date	Publication date	<->	dc.date.issued	24 :: 4	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
14	isbn-10	isbn-10	ISBN-10	X	[no default mapping]	8 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
15	isbn-13	isbn-13	ISBN-13	X	[no default mapping]	8 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
16	doi	doi	DOI	<->	dc.identifier.doi	20 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
17	medium	text	Medium	X	[no default mapping]	20 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
18	publication-status	choice	Status	X	[no default mapping]	20 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
19	keywords	keyword-list	Keywords	<->	dc.subject.keywords	29 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
20	notes	text	Notes	X	[no default mapping]	27 :: 2	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
21	number	text	Number	<->	[complex mapping - describe in a commen	5 :: 4	Article number	[no mapping - €	[as default]	[as default]	Chapter number	[no mapping - €	[as default]	[as default]	[as default]	[as
22	parent-title	text	Parent title	<->	dc.relation.ispartof	8 :: 5	[as default]	[as default]	[as default]	[as default]	Book title	dc.relation.ispa	Book title	dc.relation.refe	[as	
23	name-of-conference	text	Name of conference	X	[no default mapping]	4 :: 3	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
24	location	text	Location	X	[no default mapping]	9 :: 7	Country	[no mapping - €	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
25	start-date	date	Start date	X	[no default mapping]	8 :: 4	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
26	finish-date	date	End date	X	[no default mapping]	7 :: 5	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
27	journal	text	Journal	<->	dc.relation.ispartof	4 :: 2	[as default]	[use default ma	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
28	issue	text	Issue	X	[no default mapping]	4 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
29	issn	issn	ISSN	X	[no default mapping]	7 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
30	pil	text	Pil	X	[no default mapping]	2 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
31	language	text	Language	<->	dc.language	3 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
32	patent-number	text	Patent number	<->	dc.identifier.patentID	1 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
33	associated-authors	person-list	Associated authors	X	dc.contributor	1 :: 1	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as
34	filed-date	date	Filed date	<->	dc.date.filed	3 :: 3	Submission date	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as default]	[as

2. Repository Field List 3. Types mappings 4. Field mappings DSpace Records Testing Elements Field Grid (Processed) Repository Field List (Processed) Xwalk XML Explore





# Mapping Metadata: Types

A	B	C	D
Elements Publication Type (identifier)	Elements Publication Type (display name)	Repository Item Type (display name)	Repository Item Type (identifier, if different)
journal-article	Journal article	Article	
book	Book	Book	
chapter	Book chapter	Book chapter	
c-book	Book review	Book review	
composition	Composition		
conference	Conference proceeding	Conference proceedings	
dataset	Dataset	Dataset	
design	Design		
exhibition	Exhibition		
report	Report	Bulletin;Research Report; Technical Report; Executive Summary	
figure	Figure		
internet-publication	Internet publication	Blog	
c-newsletter	Newsletter	Newsletter	
artefact	Object		
patent	Patent	Patent	
c-internet-publication	Pedagogical material	Instruction	
performance	Performance		
c-media	Popular press		
poster	Poster	Poster	
preprint	Preprint	Preprint	
presentation	Presentation	Presentation	
scholarly-edition	Scholarly edition		
software	Software / Code		
thesis-dissertation	Thesis / Dissertation	Thesis;Dissertation	
media	Video/audio/media		
c-working-paper	Working paper	Working Paper	
other	Other		
fileset	Fileset		
c-report	Extension Publication		

- Team of four
- 20 +/- types
- dc.type.genre
- “Less is more” approach helps produce a more balanced workflow
- Omitted from auto deposit:
  - Video
  - Scholarly Editions
  - Some dissertations

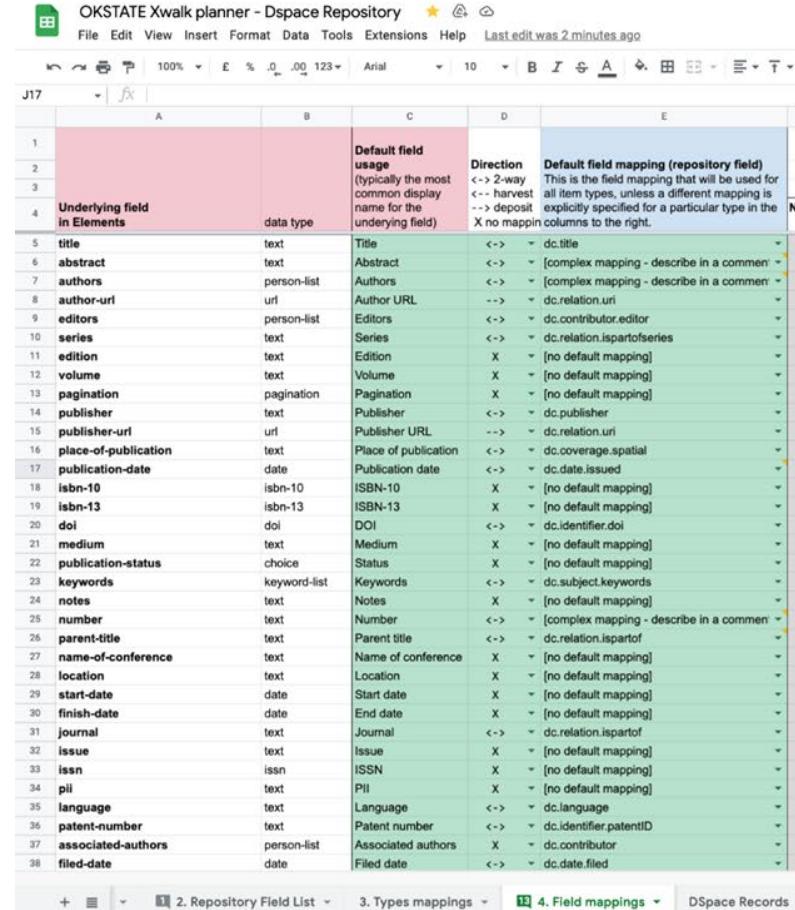
# Mapping Metadata: Fields

- Authors

- Dc.contributor
- Dc.contributor.inventor
- Dc.contributor.assignee
- Reinman, Suzanne and Ahrberg, Janet (2020)

"Issued Patents in a University's Institutional Repository," Journal of the Patent and Trademark Resource Center Association: Vol. 30 , Article 5.

<https://tigerprints.clemson.edu/jptrca/vol30/iss1/5>



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	A	B	C	D	E
1			<b>Default field usage</b> (typically the most common display name for the underlying field)	<b>Direction</b> ←→ 2-way ←- harvest -→ deposit X no mapping	<b>Default field mapping (repository field)</b> This is the field mapping that will be used for all item types, unless a different mapping is explicitly specified for a particular type in the columns to the right.
4	<b>Underlying field in Elements</b>	data type			
5	title	text	Title	←→	dc.title
6	abstract	text	Abstract	←→	[complex mapping - describe in a comment]
7	authors	person-list	Authors	←→	[complex mapping - describe in a comment]
8	author-url	url	Author URL	-→	dc.relation.uri
9	editors	person-list	Editors	←→	dc.contributor.editor
10	series	text	Series	←→	dc.relation.ispartofseries
11	edition	text	Edition	X	[no default mapping]
12	volume	text	Volume	X	[no default mapping]
13	pagination	pagination	Pagination	X	[no default mapping]
14	publisher	text	Publisher	←→	dc.publisher
15	publisher-url	url	Publisher URL	←→	dc.relation.uri
16	place-of-publication	text	Place of publication	←→	dc.coverage.spatial
17	publication-date	date	Publication date	←→	dc.date.issued
18	isbn-10	isbn-10	ISBN-10	X	[no default mapping]
19	isbn-13	isbn-13	ISBN-13	X	[no default mapping]
20	doi	doi	DOI	←→	dc.identifier.doi
21	medium	text	Medium	X	[no default mapping]
22	publication-status	choice	Status	X	[no default mapping]
23	keywords	keyword-list	Keywords	←→	dc.subject.keywords
24	notes	text	Notes	X	[no default mapping]
25	number	text	Number	←→	[complex mapping - describe in a comment]
26	parent-title	text	Parent title	←→	dc.relation.ispartof
27	name-of-conference	text	Name of conference	X	[no default mapping]
28	location	text	Location	X	[no default mapping]
29	start-date	date	Start date	X	[no default mapping]
30	finish-date	date	End date	X	[no default mapping]
31	journal	text	Journal	←→	dc.relation.ispartof
32	issue	text	Issue	X	[no default mapping]
33	issn	issn	ISSN	X	[no default mapping]
34	pil	text	Pil	X	[no default mapping]
35	language	text	Language	←→	dc.language
36	patent-number	text	Patent number	←→	dc.identifier.patentID
37	associated-authors	person-list	Associated authors	X	dc.contributor
38	filed-date	date	Filed date	←→	dc.date.filed

2. Repository Field List 3. Types mappings 4. Field mappings DSpace Records

# Mapping Metadata: Fields

- Subjects
  - Keyword duplication
  - MESH
- Rights statements & licenses
  - ~~Dc.rights~~
  - Dc.rights.license = Author license
  - ~~Publisher license~~

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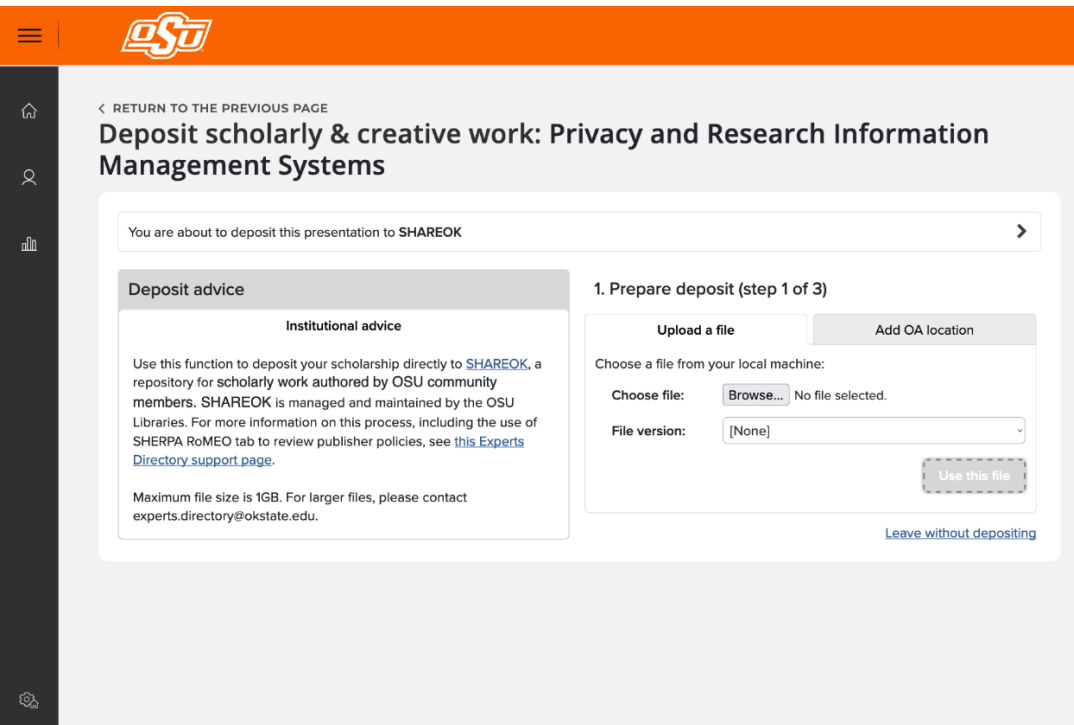
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	A	B	C	D	E
1			<b>Default field usage</b> (typically the most common display name for the underlying field)	<b>Direction</b> <-> 2-way <- harvest -> deposit X no mapping	<b>Default field mapping (repository field)</b> This is the field mapping that will be used for all item types, unless a different mapping is explicitly specified for a particular type in the No
4	<b>Underlying field in Elements</b>	<b>data type</b>			
5	title	text	Title	<->	dc.title
6	abstract	text	Abstract	<->	[complex mapping - describe in a comment]
7	authors	person-list	Authors	<->	[complex mapping - describe in a comment]
8	author-url	url	Author URL	->	dc.relation.uri
9	editors	person-list	Editors	<->	dc.contributor.editor
10	series	text	Series	<->	dc.relation.ispartofseries
11	edition	text	Edition	X	[no default mapping]
12	volume	text	Volume	X	[no default mapping]
13	pagination	pagination	Pagination	X	[no default mapping]
14	publisher	text	Publisher	<->	dc.publisher
15	publisher-url	url	Publisher URL	->	dc.relation.uri
16	place-of-publication	text	Place of publication	<->	dc.coverage.spatial
17	publication-date	date	Publication date	<->	dc.date.issued
18	isbn-10	isbn-10	ISBN-10	X	[no default mapping]
19	isbn-13	isbn-13	ISBN-13	X	[no default mapping]
20	doi	doi	DOI	<->	dc.identifier.doi
21	medium	text	Medium	X	[no default mapping]
22	publication-status	choice	Status	X	[no default mapping]
23	keywords	keyword-list	Keywords	<->	dc.subject.keywords
24	notes	text	Notes	X	[no default mapping]
25	number	text	Number	<->	[complex mapping - describe in a comment]
26	parent-title	text	Parent title	<->	dc.relation.ispartof
27	name-of-conference	text	Name of conference	X	[no default mapping]
28	location	text	Location	X	[no default mapping]
29	start-date	date	Start date	X	[no default mapping]
30	finish-date	date	End date	X	[no default mapping]
31	journal	text	Journal	<->	dc.relation.ispartof
32	issue	text	Issue	X	[no default mapping]
33	issn	issn	ISSN	X	[no default mapping]
34	pil	text	Pil	X	[no default mapping]
35	language	text	Language	<->	dc.language
36	patent-number	text	Patent number	<->	dc.identifier.patentID
37	associated-authors	person-list	Associated authors	X	dc.contributor
38	filed-date	date	Filed date	<->	dc.date.filed

4. Field mappings

DSpace Records

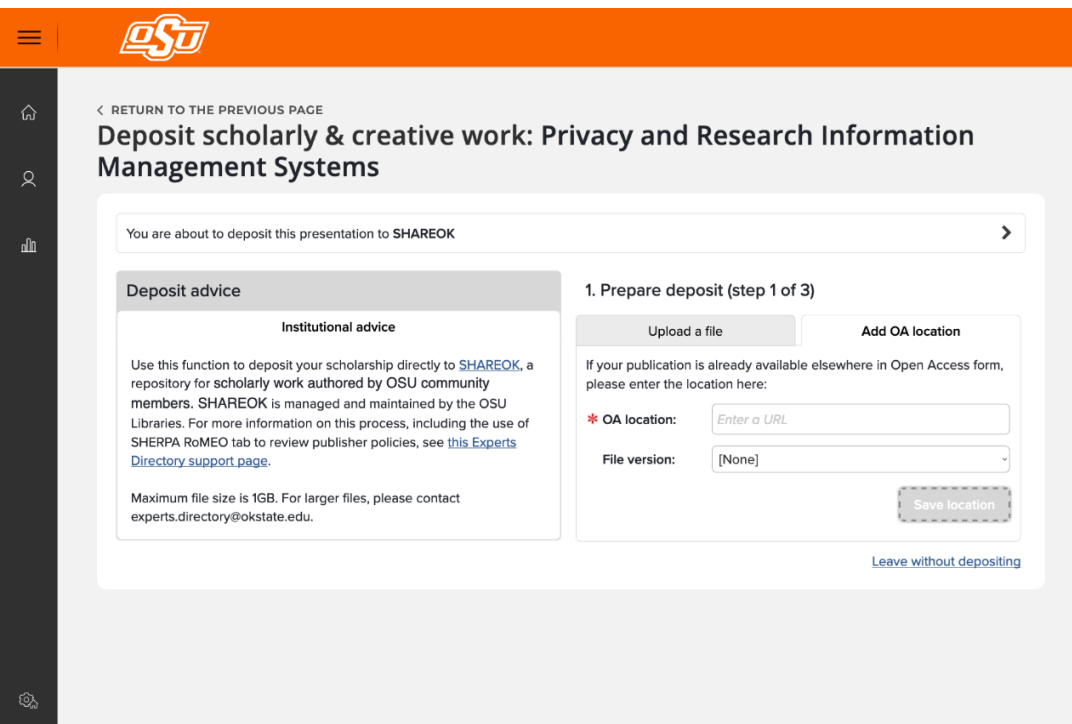
# Workflow for Processing Deposits



The screenshot shows the OSU SHAREOK deposit interface. At the top, there is an orange header with the OSU logo. Below the header, a navigation bar contains a home icon, a search icon, and a bar chart icon. The main content area has a grey background and features a breadcrumb trail: < RETURN TO THE PREVIOUS PAGE. The title of the page is "Deposit scholarly & creative work: Privacy and Research Information Management Systems". Below the title, a white box contains the text "You are about to deposit this presentation to SHAREOK" with a right-pointing arrow. The interface is divided into two main sections. The left section, titled "Deposit advice", contains a sub-section "Institutional advice" with the following text: "Use this function to deposit your scholarship directly to [SHAREOK](#), a repository for scholarly work authored by OSU community members. SHAREOK is managed and maintained by the OSU Libraries. For more information on this process, including the use of SHERPA RoMEO tab to review publisher policies, see [this Experts Directory support page](#). Maximum file size is 1GB. For larger files, please contact [experts.directory@okstate.edu](mailto:experts.directory@okstate.edu)." The right section, titled "1. Prepare deposit (step 1 of 3)", contains two tabs: "Upload a file" (selected) and "Add OA location". Below the tabs, the text "Choose a file from your local machine:" is followed by a "Choose file:" label, a "Browse..." button, and the text "No file selected.". Below that is a "File version:" label, a dropdown menu showing "[None]", and a "Use this file" button. At the bottom right of this section is a link "Leave without depositing".

- Testing with Symplectic: iterative
  - Data structure & workflow changes
- User workflow:
  - File upload
  - Share an open access link

# Workflow for Processing Deposits



The screenshot shows a web interface for depositing scholarly work. At the top is an orange header with the OSU logo. Below it is a navigation bar with a home icon, a user profile icon, and a document icon. The main content area has a breadcrumb trail: < RETURN TO THE PREVIOUS PAGE. The title is "Deposit scholarly & creative work: Privacy and Research Information Management Systems". A status bar indicates "You are about to deposit this presentation to SHAREOK". The interface is divided into two main sections: "Deposit advice" and "1. Prepare deposit (step 1 of 3)".

**Deposit advice**

**Institutional advice**

Use this function to deposit your scholarship directly to [SHAREOK](#), a repository for scholarly work authored by OSU community members. SHAREOK is managed and maintained by the OSU Libraries. For more information on this process, including the use of SHERPA RoMEO tab to review publisher policies, see [this Experts Directory support page](#).

Maximum file size is 1GB. For larger files, please contact [experts.directory@okstate.edu](mailto:experts.directory@okstate.edu).

**1. Prepare deposit (step 1 of 3)**

Upload a file      Add OA location

If your publication is already available elsewhere in Open Access form, please enter the location here:

\* OA location:

File version:

[Leave without depositing](#)

- Testing with Symplectic: iterative
  - Data structure & workflow changes
- User workflow:
  - File upload
  - Share an open access link



# Workflow for Processing Deposits

- Library workflow:
  - Increased production, add processes, workflow changes
  - check for an existing publication
  - move from the Development collection to Faculty Papers or another collection [NEW]
  - edit metadata to conform to local standards
  - verify open access
  - re-upload bitstream with standardized filename [NEW]



# Ag Extension Publication Deposits

- Concurrent metadata remediation process and transition to Open Journal Systems (OJS) for publication review
- This provided a holistic look at the extensive collection as we encountered issues during the harvest and deposit process:
  - Curated collection now with faculty-contributed metadata.
  - Who can edit data?
  - Locking the Extension Publication type in Elements
  - Working with Ag Communications Staff
  - Priority processing in DSpace for faculty papers



# Versioning

- A single item might have multiple versions of the same object that must be identified
- Journal article versions
  - Users can specify different versions of a journal article (submitted, accepted, or published), which is added to the DSpace metadata
  - However, if the bitstream is updated (e.g. to change the file name), the version information must be re-entered because it pertains only to the version/bitstream





# Versioning

- Ag Extension fact sheet versions
  - Updated with new research or as faculty are hired/retire
  - In DSpace we make new versions most visible, and make older versions available as distinct records
  - Even though each item has a distinct UUID, Elements only surfaces the most recent version and we must send older versions in a separate process.
- We opted to import all fact sheet versions because senior faculty may want to have that publication in their profiles, even if the information in the fact sheet has been superseded
- These are fundamental questions related to the purpose of the system: is it a tool for public profiles, annual reporting, or both?
  - Since it is currently both for us, we continue to deduplicate and support claiming older versions; however, this creates more work for the library related to file and version management

## Version History

Version	Item	Date
4	11244/49846.4*	2022-04-28T20:26:40Z
3	11244/49846.3	2022-04-28T20:26:12Z
2	11244/49846.2	2022-04-28T14:38:12Z
1	11244/49846	2017-03-29T16:29:20Z



# Deduplication

- Elements regularly monitors DSpace for new items; if it finds a matching item, the repository metadata is added to the publication object as a new record, otherwise Elements creates a new publication.
- In most cases, the automatic deduplication process in Elements is helpful, but occasionally it introduces errors that require us to split records;
  - Conference presentation merged with a journal article
  - An older fact sheet edition merged with a new fact sheet
- Deduplication can be time-intensive and generally requires manual verification



# Results

- Increased usage of SHAREOK despite relatively soft marketing launch
- Cleaner metadata & less remediation for SHAREOK records
- Examining the mappings so closely led us to review the consistency and completeness of existing metadata in SHAREOK, as well as our data structure in Elements, leading to improvements in both systems



## Next steps

- The technological barrier is lowered, but there is still work to do on policy side to incentivize and/or require deposit of manuscripts
- User education: author rights & versions
- Managing OA workflow between departments
- Upgrade to DSpace 7 - projected for 2023
- Analysis & visualization of SHAREOK objects



## Questions

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