

LANKA EDUCATION AND RESEARCH NETWORK

**DIGITALIZING RESEARCH & ACADEMIC
CONTENT and WORKFLOWS**

ON LEARN FOSS FREE OPEN CLOUD PLATFORM



INTRODUCTION – FOSS TEAM



Senevi Herath,
Senior Network / System
Manager
senevih@learn.ac.lk



Deepthi Gunesekara,
Senior Network / System
Engineer
deepthi@learn.ac.lk



Nuwan Ishara,
Senior Network / System
Engineer
nuwan@learn.ac.lk



Gayan Bandara,
Network / System
Engineer
gayan@learn.ac.lk



Buddhika Sandaruwan,
Network / System
Engineer
buddhika@learn.ac.lk

LEARN SAAS (CLOUD SERVICES)

INTRODUCTION

- LEARN has implemented set of software in its private cloud
- These tools can be accessed via internet software as a service
- Following software are available to use (<https://learn.ac.lk/index.php/service/foss-services>)
 - ODRaas – Open Digital Repository
 - LEARN Event Management System
 - LTube – LEARN Tube
 - Moodle as a Service
 - WordPress as a Service
 - LEARN virtual Class Room (vCR)
 - LIAF – LEARN Identity Access Federation
 - EduID
 - IaMlaas
 - EduRoam
 - EduVPN

SESSION OUTLINE

- DSPACE
- ORCID
- ORCHID creation and integration
- Demonstration
- Q&A

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**RESEARCH
PUBLICATION
REPOSITORY – DSPACE
CRIS WITH ORCID
INTEGRATION**

REPOSITORY SOFTWARE

- ▶ Open Access & Dissemination
 - ▶ Provides free, global access to scholarly works, increasing research visibility and impact.
- ▶ Metadata Management
 - ▶ Supports rich, customizable metadata to describe resources thoroughly, improving search and discovery.
- ▶ Persistent Identifiers
 - ▶ Assigns DOIs or handles to ensure stable, long-term links to digital objects.
- ▶ Self-Archiving / Submission Workflows
 - ▶ Allows researchers to deposit their own work, often with review and approval workflows.

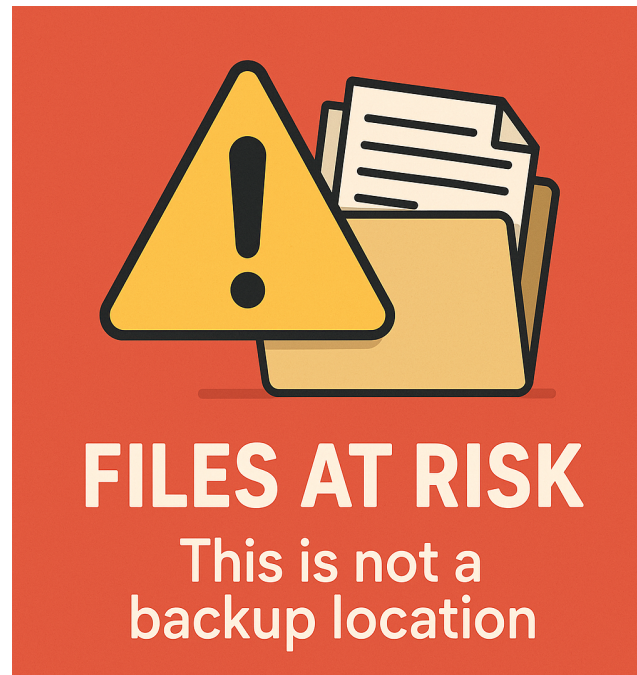
KEY FEATURES OF REPOSITORY SOFTWARE

- ▶ Compliance Tools
 - ▶ Supports open access mandates and funder requirements (e.g., embargoes, licensing options).
- ▶ Interoperability
 - ▶ Uses standards like OAI-PMH for harvesting and integration with other systems (Google Scholar, ORCID, national repositories).
- ▶ Access Control & Permissions
 - ▶ Manages who can deposit, edit, or view items; supports embargo periods for sensitive content.
- ▶ Long-Term Preservation
 - ▶ Includes versioning, format migration, and backup tools to ensure digital longevity.

KEY FEATURES OF REPOSITORY SOFTWARE

- ▶ Reporting & Usage Statistics
 - ▶ Tracks downloads, views, and citation metrics for researchers and institutions
- ▶ Customizable Interface
 - ▶ Offers adaptable design and branding to align with institutional identity.

KEY FEATURES OF REPOSITORY SOFTWARE



- ▶ This where you publish your documents/ research papers etc
- ▶ Not a backing up location
- ▶ It is better to have copies/ backups of your work with yourself.

POPULAR REPOSITORY SOFTWARE



POPULAR REPOSITORY SOFTWARE

Eprints

What it is: One of the first open-source repository platforms, designed for academic papers, theses, and open access archives.

Good for: Universities, research institutions.

Key features: Easy install, flexible metadata, simple submission interface.

Islandora

What it is: A framework that combines Fedora with Drupal (a CMS) for building digital repositories with advanced web publishing.

Good for: Libraries, museums, archives that want rich digital exhibits.

Key features: Highly customizable front-end with Drupal, powerful metadata and media support.

POPULAR REPOSITORY SOFTWARE

Samvera (formerly Hydra)

What it is: A flexible open-source repository framework built on Fedora, Ruby on Rails, and Solr.

Good for: Large institutions needing custom workflows or special digital asset management.

Key features: Modular, community-driven; powers institutional repositories, digital archives, and more.

Greenstone

What it is: A toolkit for building digital library collections. Widely used for digitizing and sharing local or historical collections.

Good for: Libraries, cultural heritage institutions, NGOs.

Key features: Multilingual, supports many formats, offline CD/DVD export.

POPULAR REPOSITORY SOFTWARE

Fedora

Flexible Extensible Digital Object Repository Architecture

What it is: A robust framework for building digital repositories
- used by many large digital libraries and archives.

Good for: Institutions needing a customizable, scalable back end for complex digital collections.

Key features: Flexible data modeling, linked data support, strong preservation capabilities.

POPULAR REPOSITORY SOFTWARE

Invenio

What it is: A digital library framework developed by CERN, used for repositories, research data management, and digital archives.

Good for: Large-scale institutional or research repositories.

Key features: Modular, supports complex metadata, powerful search, large community.

INTRODUCTION TO DSPACE



DSpace

- is a powerful open-source repository software widely used for building open access repositories for scholarly and published digital content. I'll give you a full guide - from beginner to expert covering all the main aspects: concepts, installation, configuration, administration, customization, user roles, and advanced operations.
- is a digital repository system for storing, managing, and accessing digital content.
- It's mainly used by academic, non-profit, and research institutions.

DSPACE ARCHITECTURE : OVERVIEW

The existing architecture was selected to considering the followings:

- Separation of concerns: Clear split between storage, logic, and presentation.
- Scalable: Can run on a single server or distributed setup.
- Extensible: REST API lets you build new UIs or integrate with other systems (like ORCID, DOI services).
- Flexible: Any file type, any metadata schema.

DSPACE ARCHITECTURE : OVERVIEW CNT.

Back-end: Java-based, PostgreSQL database.

Front-end: JSPUI (classic JSP-based) or XMLUI (Manakin) or the newer DSpace 7 Angular UI.

Search: Solr for indexing.

Authentication: LDAP, Shibboleth, IP-based, or password.

REST API: New versions support robust REST APIs.

DSPACE ARCHITECTURE : CORE COMPONENTS

Content Model :

DSpace organizes the content in following hierarchic concept;

Communities → Sub-Communities → Collections → Items
→ Bundles → Bitstreams

- Community → Top-level unit (e.g., Faculty of Science)
- Sub-Community → Optional (e.g., Department of Physics)
- Collection → Group of related items (e.g., Undergraduate Theses)
- Item → The actual record (e.g., John's Thesis)
- Bundle → Logical group of files inside an item (e.g., ORIGINAL, LICENSE, THUMBNAILS)
- Bitstream → The actual file (PDF, JPG, dataset)

DSPACE ARCHITECTURE : CORE COMPONENTS

Storage Model :

- Database: Stores metadata and structure (PostgreSQL or Oracle supported).
- File System: Stores files (bitstreams) in a directory tree on disk.
- Handle Server: Manages persistent identifiers for items (handle.net or DOI).

DSPACE ARCHITECTURE : CORE COMPONENTS

Business Model :

- Written in Java.
- Submission workflows (review, approve, reject).
- Access policies (read, submit, admin).
- Indexing & search (via Apache Solr)
- Authentication (LDAP, Shibboleth, SAML, local accounts)
- Plugins for custom workflows or metadata formats

DSPACE ARCHITECTURE : CORE COMPONENTS

Application Model :

Two main interfaces in DSpace 7+:

- Angular UI (XMLUI deprecated).
 - responsive front-end built with Angular
 - Better user experience for browsing, searching, submitting
- REST API
 - Provides endpoints for developers to build custom front-ends, mobile apps, or integrate with other systems.

DSPACE ARCHITECTURE : AUTHENTICATION & AUTHORIZATION

Authentication:

- Local database accounts (username/password).
- LDAP or Active Directory
- Shibboleth/SAML for Single Sign-On (SSO)
- OAuth plugins (custom)

Authorization:

- Administrators, Community Admins, Collection Admins, Submitter, Anonymous.
- Policies define who can:
 - Read, Submit, Edit, Approve

DSPACE ARCHITECTURE : DEPLOYMENT STACK

Component	Typical Tech
OS	Linux (common), Windows
Web Server	Apache Tomcat (Java Servlet Container)
Database	PostgreSQL
Search	Apache Solr
UI	Angular app served by Tomcat or separate Node.js

DSPACE CRIS

Dspace CRIS is :

- Current Research Information Systems (CRIS)
- Its like the information management system
- Built on the Dspace Core
- Added extra functionality with following features
 - Researcher Profiles
 - Funding information
 - Advanced Organization Structuring (Faculty, Department etc)
 - Research assessment.
 - Workflows (submit, edit, review, approval)

DSPACE USER ROLES

<u>Role</u>	<u>Capabilities / Tasks</u>
Administrator	Full control over all system configurations, users, and content.
Community Admin	Manage sub-communities, collections in their community.
Collection Admin	Manage submissions, workflows for their collection.
Submitter	Submit new items.
Reviewer	Checks if the submission meets basic requirements.
Editor	Improves or corrects metadata, attaches missing files, fixes typos in title/description, checks subject headings, etc.
Final Editor	Gives final sign-off for the item to be archived and published in the collection.
Anonymous User	Search, browse, download publicly available items.

DSPACE USER ROLES : ADMINISTRATOR

- Add/edit/delete users.
- Create communities/collections.
- Define workflows: 1-step, 2-step, 3-step.
- Configure permissions.
- Run batch imports/exports.
- Edit metadata schema.
- Monitor usage stats.
- Backup and restore the database and asset store.
- Configure search/browse indexes.

DSPACE USER ROLES : COMMUNITY ADMIN

A Community Administrator manages only their assigned community (and its sub-communities and collections).

- Create/edit sub-communities under their community.
- Create/edit collections under their community.
- Assign Collection Administrators or submitters.
- Edit community-level metadata.
- Review submissions (if workflow is enabled).
- Moderate content: approve, reject, or edit items.

DSPACE USER ROLES : COLLECTION ADMINISTRATOR

A Collection Administrator manages a specific collection within a community.

- Edit collection metadata.
- Define submission workflows: 1-step (approve only) or multi-step (review, edit, approve).
- Approve or reject new submissions.
- Assign submitter to the collection.
- Manage items:
 - Edit metadata.
 - Withdraw or delete items.
 - Moderate content: approve, reject, or edit items.

DSPACE USER ROLES : SUBMITTER

A Submitter is a user who can upload new content to specific collections they are authorized for.

- Log in to DSpace.
- Fill out a submission form:
- Enter metadata (title, author, date).
- Upload files (PDFs, datasets, images).
- Track the status of their submissions.
- Edit or withdraw submissions before final approval (depending on workflow setup).

DSPACE USER ROLES : REVIEWER

A Reviewer is a user who can .

- Log in to Dspace.
- View new submissions
- Checks if the submission meets basic requirements
e.g. correct file type, rights, content fits scope
- accept, reject, or return to submitter for changes.
- Add comments for submitter

DSPACE USER ROLES : EDITOR

An Editor is a user who can .

- Log in to DSpace.
- View submissions that passed review
- Edit metadata fields (title, author, subjects)
 - Improves or corrects metadata, attaches missing files, fixes typos in title/description, checks subject headings, etc.
- minor content corrections (but not big content changes).
- Forward to final approval.

DSPACE USER ROLES : FINAL EDITOR

A Final Editor is a user who can .

- Log in to DSpace.
- View fully reviewed & edited items.
- Do final policy check (copyright, embargo, licenses, completeness).
- Approve - Gives final sign-off for the item to be archived and published in the collection. They check if all policies are met
- Reject - if critical issues remain.

DSPACE USER ROLES : ANONYMOUS USER

The Anonymous User is anyone visiting the repository without logging in — basically, the general public.

- Browse all public communities, collections, and items.
- Search for items using keywords.
- View item pages and download openly accessible files.
- See basic metadata (title, author, abstract).
- They cannot submit, edit, or manage anything.

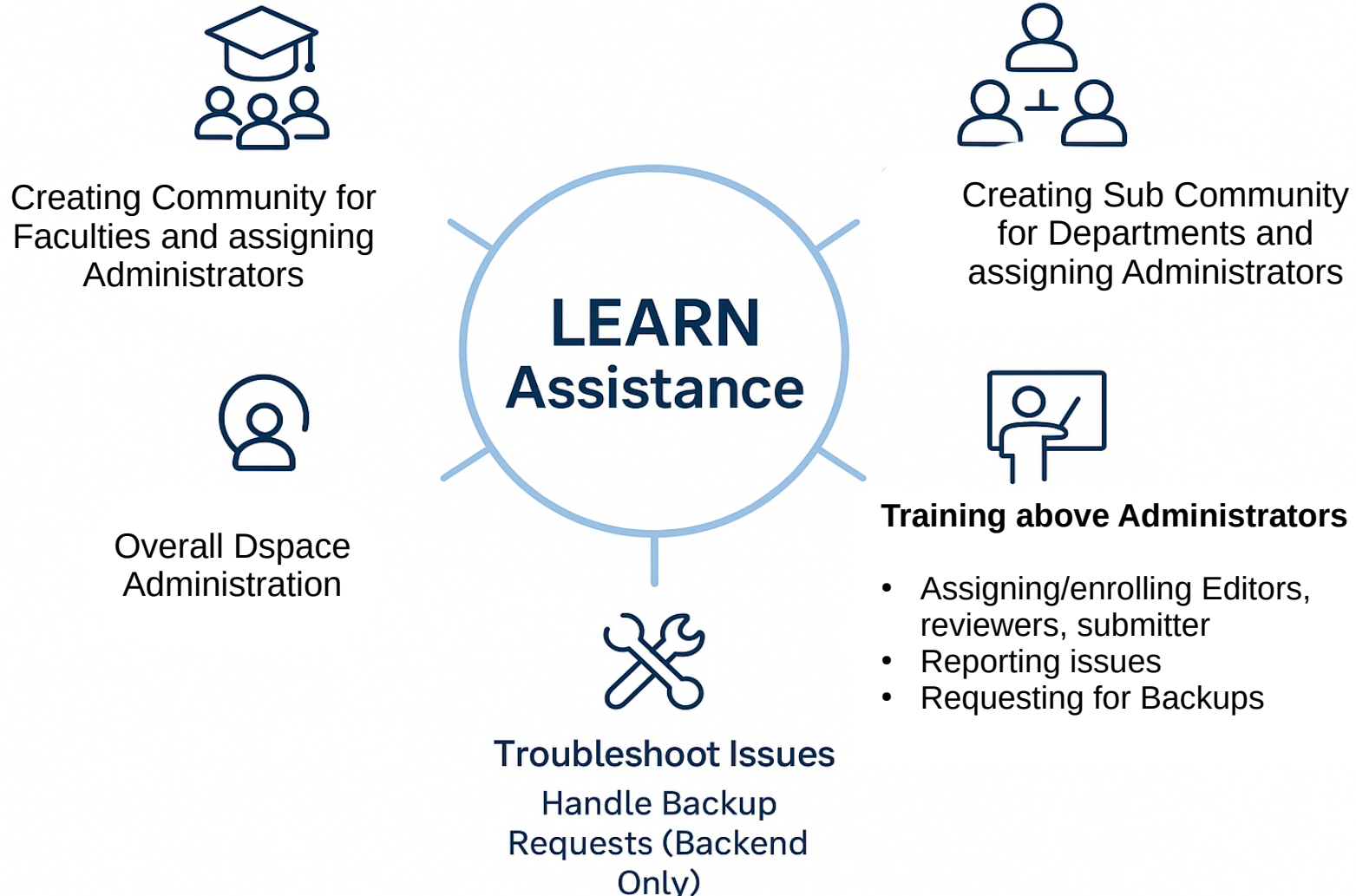
DSPACE BACKUP & RESTORE

DSpace does not provide a full backup/restore feature through its web GUI, you need have server-level access to do backup files and configurations.

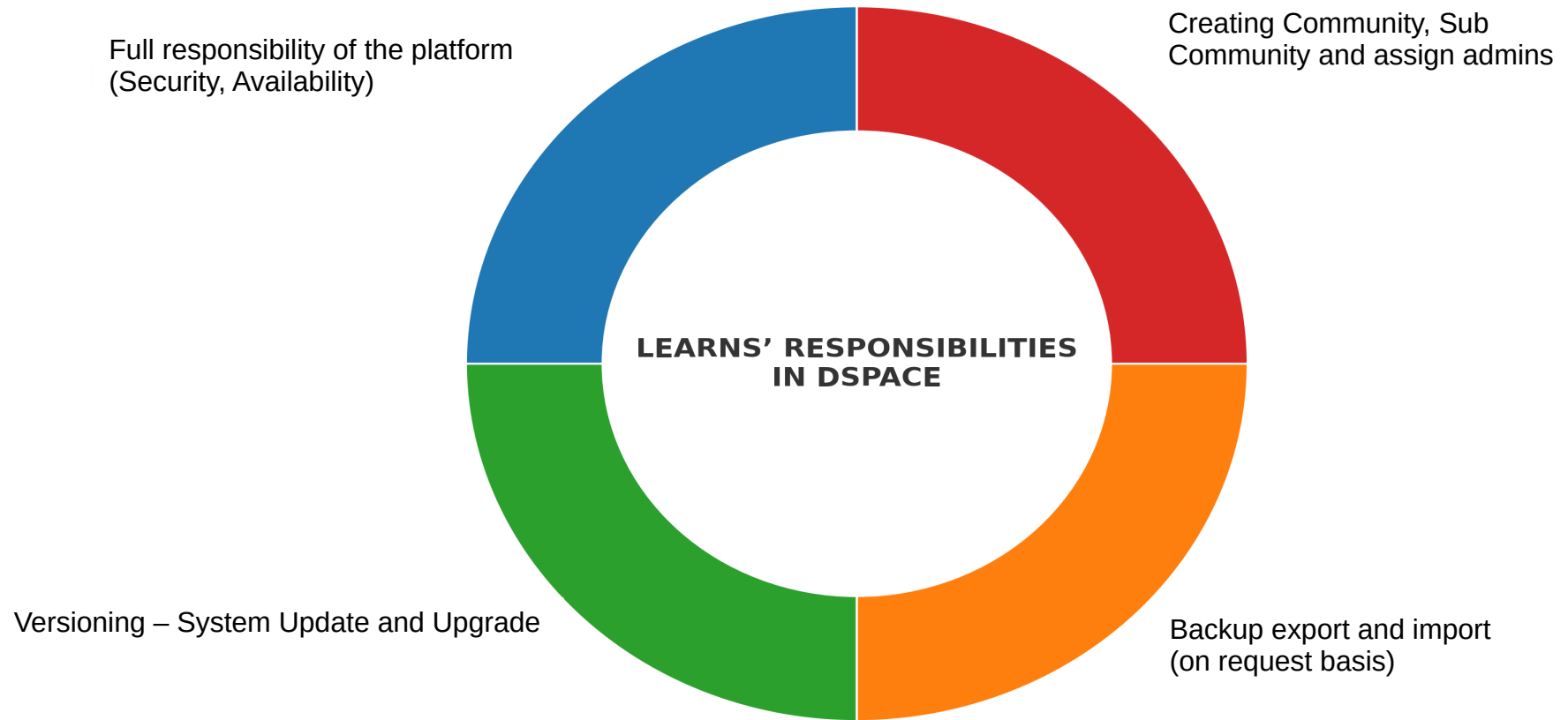
Backup Locations

Backup Item	Location
PostgreSQL DB	Managed by pg_dump
Assetstore	/dspace/assetstore/
Config files	/dspace/config/
Solr	/dspace/solr/

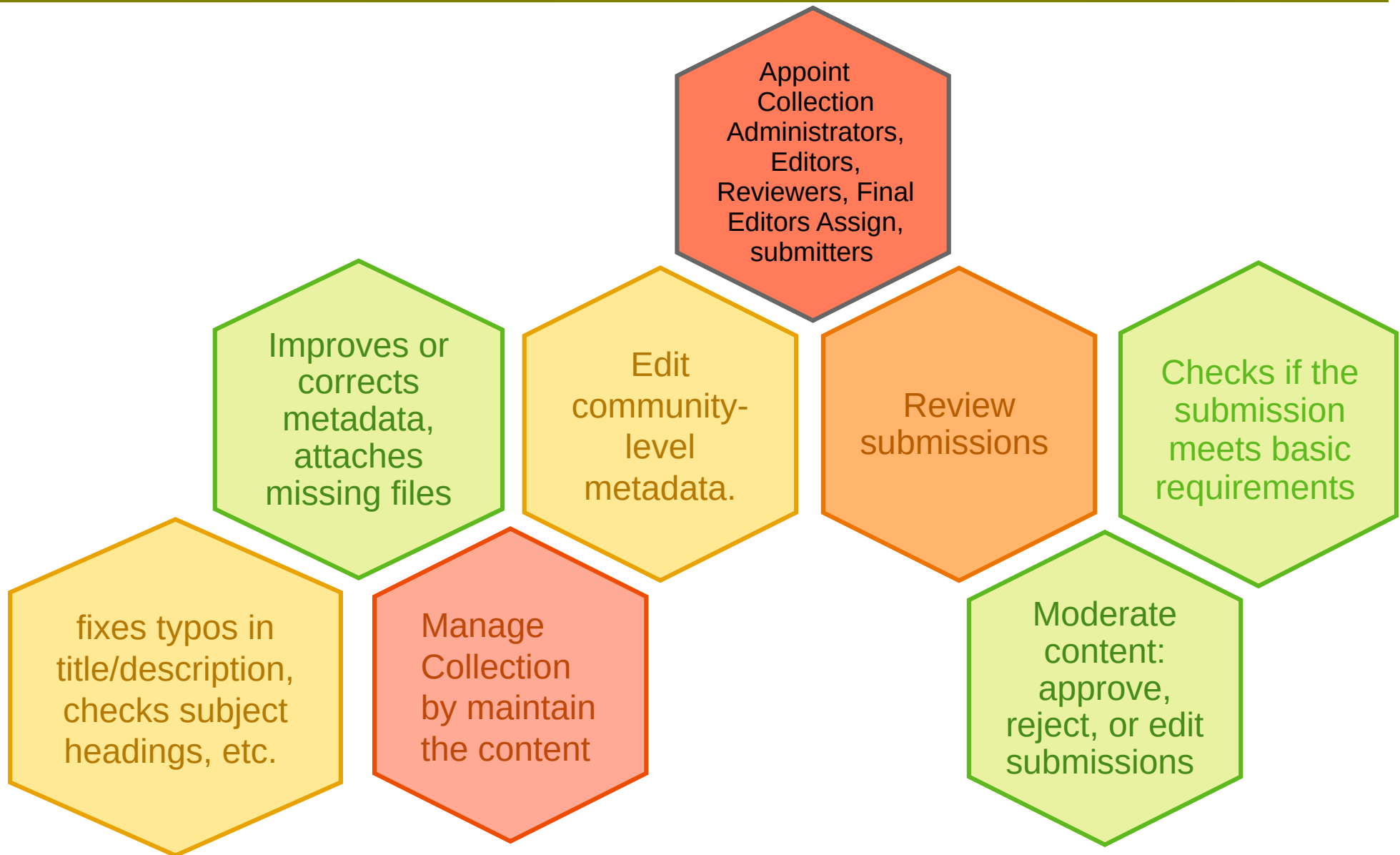
LEARNS' ROLE IN DSPACE



LEARNS' RESPONSIBILITIES IN DSPACE



RESPONSIBILITIES OF COORDINATORS IN DSPACE



METADATA IN DSPACE

Core Metadata (Mandatory)	Additional Metadata (Depending on Item Type)
<ul style="list-style-type: none">• Title - The main title of the item• Author(s) / Creator(s)• Advisor/Thesis Supervisor• Date of Issue• Type - Article, Thesis, Dataset, Report• Language• Abstract• Keywords - terms describing the subject area	<ul style="list-style-type: none">• Publisher• Citation• DOI / Handle - Persistent identifiers• Series/Report Number - If part of a report or series.• Department/Faculty• Description - Any additional notes• Rights - Copyright or license• File Format

LANKA EDUCATION AND RESEARCH NETWORK

THANK YOU



National Research & Education Network of Sri Lanka