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Building an Institutional Repository with Omeka Open-Source Software

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Abstract:

Omeka is a digital library software, that is free, content management system (CMS), open-source software designed to facilitate the creation of digital repositories for libraries, exhibitions, and archives in museums. In this paper outlines the process of building a repository using Omeka, which includes an installation guide for Omeka. The creation of collections and items, organization of metadata using Dublin Core standards, and customization of themes to match the repository's aesthetic. Additionally, we have to run Omeka (version 3.1.2), which Operating System is Ubuntu 24.04.3 LTS, with PHP (version 8.3.26, using the apache2handler), MySQL Server (version 10.11.13) database support, Apache server version 2.4.58, and sufficient storage for hosting digital files. Through this approach, Omeka supports the creation of dynamic, accessible, and well-organized digital collections, while fostering collaboration and community engagement in open source heritage projects. By enabling libraries to digitize, preserve, and provide public access to their collections, Omeka provides an effective platform for developing scalable, user-friendly, library repositories that align with open-source principles. Omeka's scalability, flexibility, and community driven development make it an ideal platform for creating accessible and interactive digital repositories.

Keyword: Content Management System, Dublin Core, Institutional Repository, Omeka, Open-Source Software.

1. Introduction:

Academic institutions are increasingly embracing open access technologies to manage and disseminate their intellectual output. A digital repository serves as a centralized platform for preserving, collecting and providing access to the scholarly and cultural resources of an institution. It plays vital role in enhancing the visibility, accessibility, and long-term preservation of academic content such as theses, dissertations, faculty publications, institutional reports, and digitized archives. Its support for Dublin Core metadata, along with an extensible plugin architecture, allows for rich description, discoverability, and

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interoperability of digital resources. Building a digital repository through Omeka ensures the integration of library automation and digital preservation practices, providing a sustainable framework for knowledge management. The system allows librarians and administrators to curate collections, upload digital content, and make materials accessible to the global academic community through a simple web interface.

1.1 Objective of the study:

a) To build an institutional repository, including installation steps using Omeka Classic Open-Source Software.
b) To identify the key features of the Omeka repository.
c) To describe the system requirements for building a repository using Omeka Classic.

2.Literature Review:

While DSpace and E-Prints remain popular within the academic community, Omeka has emerged as a distinct alternative widely used in archival and museum contexts, offering unique plugin features that differentiate it from other institutional repository software (Hazarika & Ravikumar, 2019). Unlike repository platforms primarily designed for text-based preprints, Omeka emphasizes rich metadata and visual presentation, making it particularly suitable for curating digital collections and exhibits without requiring extensive web development resources (Becksford & Metko, 2018). This accessibility is further enhanced by the platform's shallow learning curve, which enables librarians and archivists to assume the role of developers or administrators without requiring specialized web design teams. Furthermore, Omeka's specialized design for information professionals provides richer features for creating curated, annotated exhibits compared to general-purpose content management systems like WordPress or Drupal, which would require extensive customization to incorporate standards such as Dublin Core metadata (Reed, 2016). The platform's open-source architecture allows for extensive customization through modules and visual models, enabling institutions to adapt the system to specific project needs while maintaining straightforward underlying structures (Walter, 2020). This specialized functionality positions Omeka as a viable solution for institutions seeking to develop digital scholarship ecosystems that integrate online institutional collection repositories with curated exhibits and educational resources. Recent case studies demonstrate how small-scale institutions have successfully leveraged Omeka S to develop learning object repositories that support cross-institutional and multidisciplinary academic initiatives, highlighting the platform's adaptability for open education projects (Ingram-Monteiro & McKernan, 2022). This paper find out the technical challenges and costs of installing institutional repository software are relatively minor issues, when compared with the computer skill, time and effort required with their work (Foster & Gibbons, 2005).This study employs a qualitative case study approach to evaluate the technical implementation and functional capabilities of Omeka as an institutional repository solution. (Sutradhar, 2006) provides in his paper for set up an IR and to create different communities, under each community, many collections using the DSpace software. According to him setting up an IR is very simple but its maintenance is very difficult. One person needs to the computer knowledge, particularly in the Linux operating system environment and must be dedicated to carry out the IR administrative activities etc.

3. Omeka Overview:

Omeka is used to create and share digital collections, such as online archives, institutional repository, and exhibitions. It was developed by Roy Rosenzweig Center for History, New Media at George Mason University in 2008. Omeka stable version was 3.1.2 on 2023-10-05. The open source digital repository platform Omeka is hosted on GitHub where its source code and documentation are publicly available for developers and institutions. Omeka is written in PHP, making it compatible with most web servers and easy to customize for digital library or archive projects. It operates on the LAMP stack- Linux, Apache, MySQL, and PHP, which provides a stable and widely supported environment for hosting and managing web-based digital collections. Omeka allows users to publish and exhibit the cultural heritage materials like images, videos, and documents, and is popular among libraries, museums, archives, and universities for creating visually engaging and story driven online exhibits. There are three main types (or versions) of the Omeka content management system, each designed for different needs and user levels- Omeka Classic, Omeka S, and Omeka.net.

Omeka Classic: Omeka Classic is a web-publishing platform for preserving digital collections and creating media rich online exhibits. It is used for Institution or individual projects and educators.

Omeka S: Omeka S is a next-generation web publishing platform for institutions interested in connecting digital cultural heritage collections with other resources online. It is used for institutions managing a sharable resource pool across multiple sites.

Omeka.net: Omeka.net is a hosted service option for publishing digital collections and exhibits, allowing users to run Omeka Classic without worrying about installation or hosting.

4.Methodology:

This study follows a practical implementation method, where Omeka was installed on a local Linux server environment using LAMP (Linux, Apache, MySQL, PHP). It is a very user friendly architecture. The software is available in the https://omeka.org/ website. The installation steps were documented, and system performance and usability were observed during the creation of digital collections.

5. System Requirements:

Before installation, ensure the following components are installed and configured on the machine:

Component	Requirement
Operating System	Linux (Ubuntu)
Web Server	Apache (with mod_rewrite enabled and Allow Override All)
Database	MySQL 5.5.5+ or MariaDB

PHP	Version 7.4+ (with extensions: pdo, pdo_mysql, session, mbstring, xml, json, gd)

Table 1: System Requirements

5.1. Installation Steps:

Omeka Classic Installation (on LAMP Server)

Install LAMP Architecture

Open a terminal and run

Step 1: Update and Upgrade System Packages

sudo apt update && sudo apt -y upgrade

Step 2: Install Apache, MariaDB, PHP, and other Dependencies

sudo apt install -y apache2 mariadb-server php imagemagick libapache2-mod-php php-mysqli php-exif php-dom php-solr wget

Step 3: Install MariaDB

Installation code is- sudo mysql_secure_installation

(The command will prompt you to set up the root user password, script will reload the privilege tables ensuring that the all changes take effect immediately. All the steps it is recommended to answer “Y” (yes) to all questions.)

Step 4: Enable Apache Modules

sudo a2enmod rewrite

Step 5: Configure Apache for Omeka

sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/omeka.conf

sudo vim /etc/apache2/sites-available/omeka.conf

After the

Modify the `DocumentRoot` and `ServerName` to point to your Omeka installation:

DocumentRoot /var/www/html/omeka

ServerName your-domain.com

Add the following code just before the `</VirtualHost>` closing tag:

<Directory /var/www/html>

Options Indexes FollowSymLinks MultiViews

AllowOverride All

Require all granted

</Directory>

Step 6: Download and Install Omeka

cd /var/www/html

sudo wget https://github.com/omeka/Omeka/releases/download/v3.1.2/omeka-3.1.2.zip

sudo unzip omeka-3.1.2.zip

sudo rm omeka-3.1.2.zip

sudo mv ./omeka-3.1.2/ ./omeka

Step 7: Set Up MariaDB Database

Log in as a root

sudo mysql -uroot –p

Enter the MySQL root password, then execute the following commands:

CREATE DATABASE omeka DEFAULT CHARACTER SET utf8 DEFAULT COLLATE utf8_unicode_ci;

GRANT ALL PRIVILEGES ON omeka.* TO 'omeka'@'localhost' IDENTIFIED BY 'omeka123';

exit;

Step 8: Configure Omeka Database Settings

sudo vim /var/www/html/omeka/db.ini

Add the following configuration of database:

[database]

host = "localhost"

username = "omeka"

password = "omeka123"

dbname = "omeka"

prefix = "omeka_"

charset = "utf8"

Step 9: Set Permissions for Omeka

sudo chown -R www-data /var/www/html/omeka/files

sudo chmod -R 751 /var/www/html/omeka/files

Lastly

Step 10: Enable Apache Site and Restart Apache

sudo a2ensite omeka.conf

sudo systemctl restart apache2

Complete the Installation:

Visit the admin page for your Omeka installation in your web browser:

http://localhost/admin/users/login

After the successful installation the web page like that

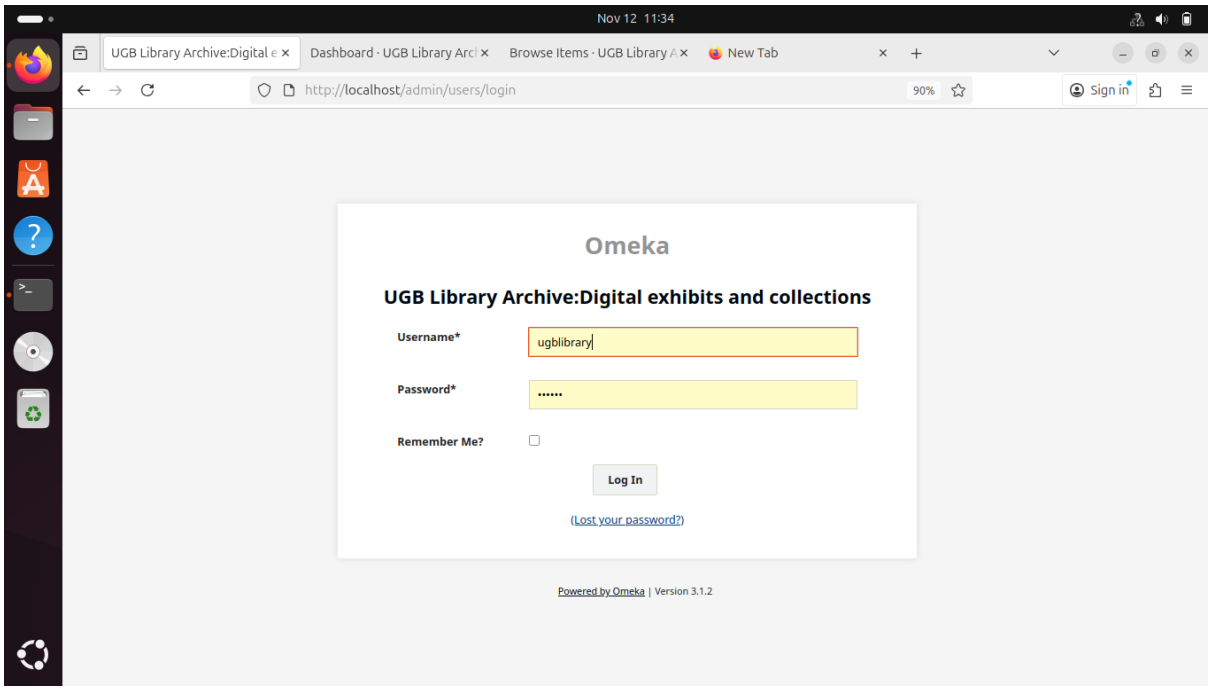

Figure 1: Omeka Log in window in localhost server

Enter the username and password login in Omeka

The dashboard is like

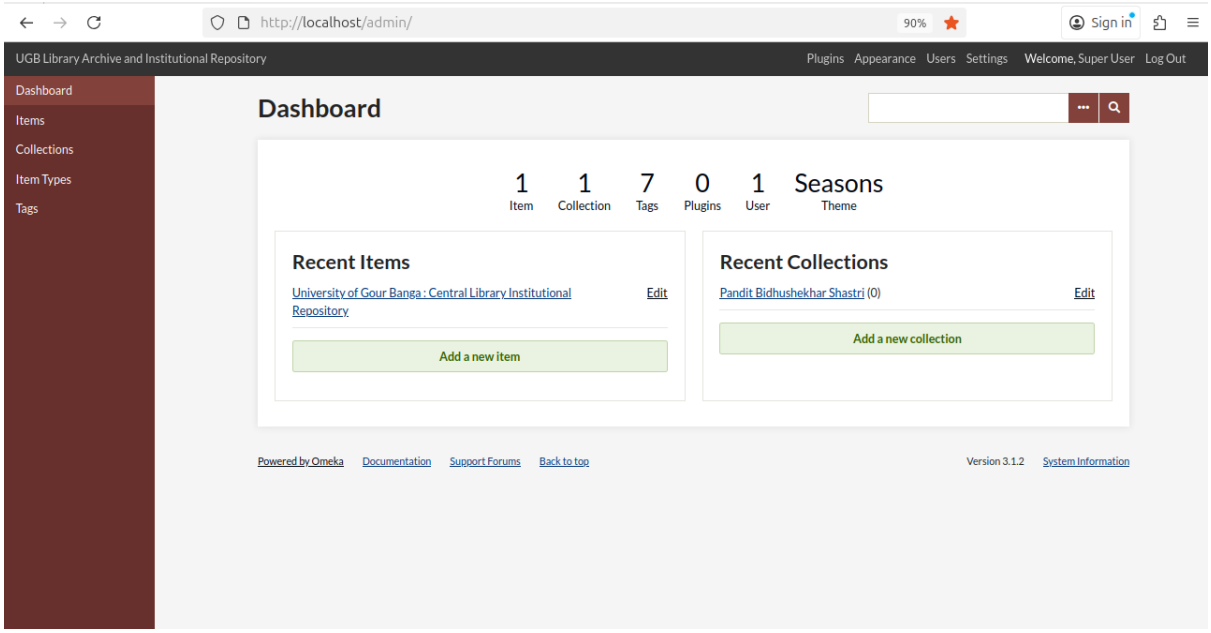

Figure 2: Omeka Dashboard window

5.2. Key Features for Omeka Repository Development

Feature	Description
Metadata Support	Supports Dublin Core (default) and can be extended to MODS, METS, or custom schemas.
Collection Management	Enables creation of multiple collections (e.g., theses, faculty publications, special archives).
User Roles	Supports admin, contributor, and researcher roles for collaborative content management.
Plugins	Extensible through plugins like *Simple Pages*, *Exhibit Builder*, *CSV Import*, and *PDF Embed*.
Themes	Customizable themes for branding and institutional identity.
Search and Browse	Offers faceted search and browsing by title, creator, subject, or collection.

Table 2: Key Features of Omeka

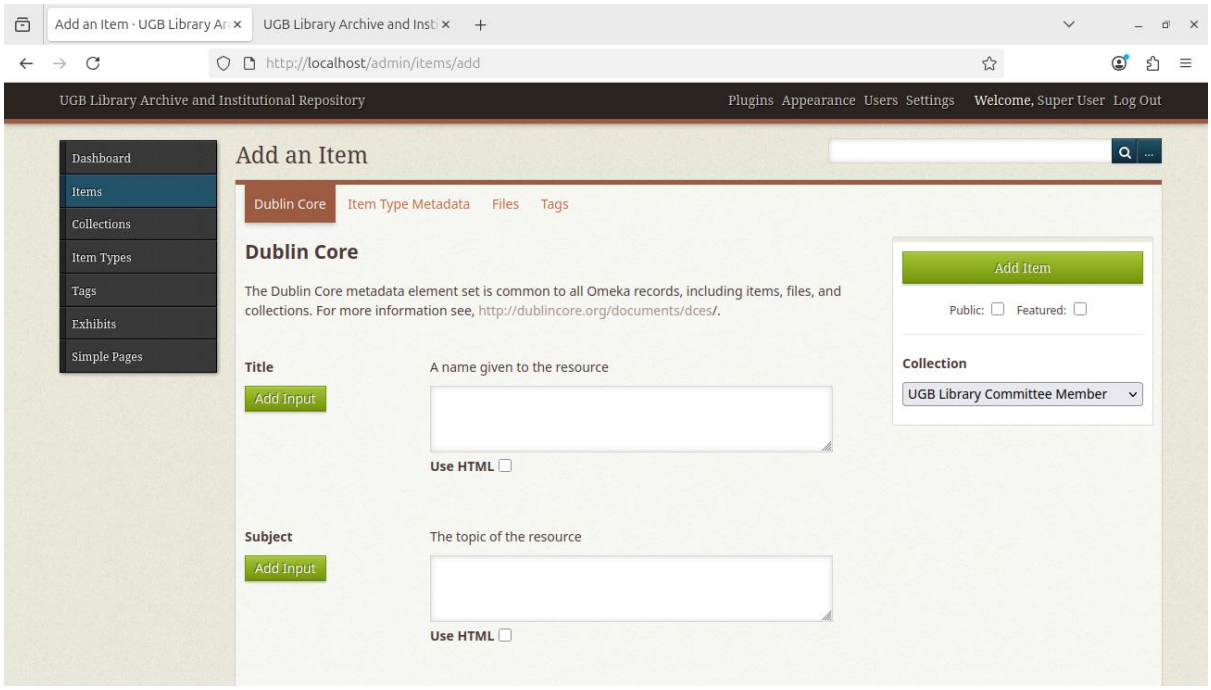

Figure 3: Omeka used Dublin Core Metadata Standard

5.3 Steps to Build a Repository Using Omeka Classic

Step 1: Browse the web browser Chrome/Firefox etc.

Follow the Omeka installation process on your LAMP server (as earlier). Once Omeka is installed and running at http://localhost/admin/users/login log in to the admin dashboard.

Step 2: Create Collections

- Navigate to **"Collections" → "Add a Collection."**
- Give each collection a name (e.g., *ETDs*, *Research Publications*, *University Archives*).
- Add metadata such as *Title*, *Description*, and *Contributor*.

Step 3: Add Items (Repository Content)

- Go to **"Items" → "Add an Item."**
- Upload digital files (PDFs, images, audio, etc.).
- Fill out metadata fields following **Dublin Core** elements:
    i. Title
    ii. Subject
    iii. Description
    iv. Creator

v. Source
vi. Publisher
vii. Date
viii. Contributor
ix. Rights
x. Relation
xi. Format
xii. Language
xiii. Type
xiv. Identifier (e.g., DOI or institutional ID)
xv. Coverage.

Step 4: Organize Metadata

- Use consistent metadata values for discoverability.
- Optionally install **"Element Sets"** plugin to add more metadata schemas.
- Enable **"Item Type Metadata"** to specify document types (e.g., Sound, Text, Website, Image etc.).

Step 5: Structure the Repository

- Create **"Exhibits"** using the *Exhibit Builder* plugin to present curated collections.
- Develop simple pages (e.g., *About Repository*, *Submission Guidelines*).
- Add a **search box** and navigation menus for easy access.

Step 6: Add Files

- Add New Files. The Maximun file size is 2 MB.
- After Find a File or Choose the file.

Step 7: Tags

- Add Tags.

After that you can check and verify the all documents and add an Item.

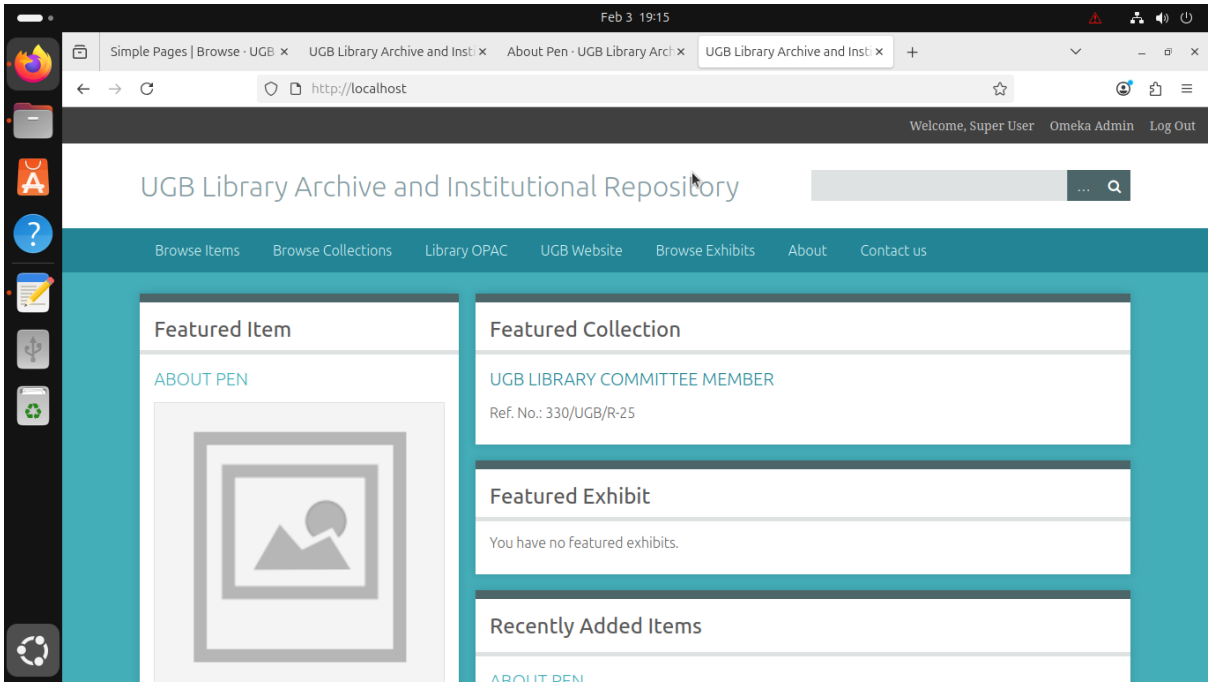

Figure 4: Customize the UGB Library Archive and Institutional Repository

6.Conclusion:

The development of an institutional repository using Omeka open-source software demonstrates a practical, cost-effective, and sustainable approach to managing and disseminating institutional digital resources. Omeka's flexibility, standards-based metadata support, and user-friendly interface make it particularly suitable for libraries and academic institutions seeking to preserve scholarly outputs, cultural heritage materials, and grey literature in a structured and accessible manner. The study highlights that Omeka supports interoperability through widely accepted metadata standards such as Dublin Core, enabling improved discoverability and long-term preservation of digital content. Its modular architecture and plugin ecosystem allow libraries to customize repository functions according to institutional needs, that require without extensive technical expertise or financial investment. Its simple installation process, metadata support, and customization options make it ideal for academic and cultural institutions. Implementing Omeka as an institutional repository also strengthens open access initiatives by enhancing the visibility, accessibility, and impact of institutional research outputs.

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