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BUILDING AN INSTITUTIONAL REPOSITORY WITH SPECIAL REFERENCE TO THE CENTRAL LIBRARY, THE ASSAM ROYAL GLOBAL UNIVERSITY (RGU): PROS AND CONS

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ABSTRACT:

In an era of digitization, it is of utmost necessity to upgrade our traditional library into a full-fledged digital library. This paper aims at creating a digital library of The Assam Royal Global University and in the process, what are the things to be kept in consideration, its pros and cons. The paper is based basically on experimental method of research. DSpace is used in the creation of Digital Library of The Assam Royal Global University. It helps in preserving all the in-house documents for its users in e-platform in a single window. It has provided easy access of the resources to the users of RGU. We have uploaded a good number of valuable resources. DSpace can be customized according to the needs of the users. We have also customized it to some extent as per our needs.



KEYWORDS: Institutional Repository, D Space, Digital Library, Royal Global University, Digitization, E platform.

1.INTRODUCTION :

The traditional concept of library is slowly shifting towards a completely digital one. Earlier books were chained so that nobody can damage it and it can be preserved for long time. But with the invention of printing, this concept has changed. Books are no longer chained and are allowed to issue for reading purpose. It is seen that books are damaged by the users or because of their age and hence the concept of digitization started. Digitization

is the process of conversion of texts, photographs, notes, maps etc. to digital form. When the documents are in digital form, it is easier to access by the users. Digital documents help in creation of digital library. A digital library is a collection of digital materials. Likewise, an institutional repository (IR) is a collection of all the intellectual assets of an institution. It aims in collecting, preserving and disseminating digital copies of intellectual outputs of the institution. It is a set of services

that an institution offers to members of its community for the management and dissemination of digital materials created by the institution and its community members. It can include many types of documents such as any journal articles (both pre-prints and post-prints), conference proceedings, any other research publications, question papers, in-house publications, institute magazines, project reports as well as dissertations. It may also include some administrative documents

like course notes, important circulars, complete database of students and staff etc. Digital objects like photographs, audio and video clips can also be included in IR. The contents of IR may contain both born-digital documents and made-digital documents. An Institutional Repository (IR) is a digital archive where a university community's intellectual work is made accessible and preserved for posterity. It can be said as intellectual store house of the institution. It provides a platform to all the users free of cost. Generally, if we want to access any journal article we have to pay for its subscription. But if the institute has its own IR, all its users can access its intellectual output in a single window connected to internet or intranet within the campus. It will also highlight the major achievements of the institute and thus will be healthier in its content globally. The documents that are not born-digital, are scanned and made digital. Clifford Lynch (2003) defined institutional repository as "a university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution." An institutional repository has been understood as a means to ensure that the published work of scholars is available to the academic community even after increases in subscription fees or budget cuts within libraries. The majority of research scholars do not provide free access to their research output to their colleagues in an organization. Institutional repositories provide scholars with a common platform so that everyone in the institution can contribute scholarly material to promote cross-campus interdisciplinary research. The development of an institutional repository redefines the production and dissemination of scholarly material within an academic community. The contents available on the institute's website usually are removed after a few weeks. An institutional repository can provide a platform to manage institutional information, including web content. Institutional repositories have a number of benefits, including access to resources, visibility of research, and presentations of the contents. There are good numbers of software for creation of an institutional repository. Some of the popular softwares are DSpace, EPrints, Bepress, GSDL etc.

2. OBJECTIVES OF THE STUDY:

- i. To assemble and preserve publications, research outputs, reports, rare documents and old question papers etc. by faculty members, research scholars and students of RGU and make them accessible to the interested users.
- ii. To digitise the documents and make them accessible for all the academic community including students.
- iii. To upload e-books, journals, thesis/dissertations, project/seminar reports, and educational videos for the students and faculty members of RGU.
- iv. To design, develop and customise the homepage as per the requirements of RGU
- v. To make the e resources accessible to the users.
- vi. To provide CAS and SDI services to the users by using DSpace.
- vii. To store descriptive data or metadata.
- viii. Finally to study the benefits those are gained by building institutional repository and the pros and cons in the installation and implementation of DSpace.

3. SCOPE AND METHODOLOGY:

The methodology applied for the study is purely experimental going through the related documents and "LIBLIVED CD" created by Sunita Barve and Prof. ARD Prasad that has been used for the installation of DSpace. Data for upload on the repository are collected from different schools/departments of the University. Individual research outputs/publications are provided by faculty members, old question papers are collected from examination cell, thesis & dissertation, newspaper clipping, seminar proceedings, photograph of different event organized are provided by the concern departments of the University. The scope is limited to the resources of the Royal Global University and restricted to the employees/employers and by the employees/employers of RGU.

4. RGU, Central Library: Royal Global University stands high with its virtues of excellence and a humble contribution to the society at large. RGU was established in the year of 2017. Earlier it was Royal Group of Institutions which came up in 2009. RGU offers a unique educational experience that prepares the next generation of global citizens to lead and make a difference in the world. RGU is a leading educational hub in the North Eastern region that maintains a particular commitment to excellence in undergraduate and postgraduate courses. RGU stands to be recognized for its world-class infrastructure, cultural events, campus recruitment programs and activities, expert students, and updated facilities. RGU has 24 different schools. Again these schools have various departments. All together it has 33 departments in RGU.

RGU Central Library is a window to the world of latest information in every aspect of knowledge whether it is literature or science and technology. RGU Central Library was also established in 2009. It provides necessary supports for teaching, learning and research activities to its users. It is currently holding 25,452 printed volumes of books and 48 subscribed print journals of diverse departments. It subscribes seven daily newspapers along with 29 magazines. It has a special collection called “North East Corner” that contains books on rich diversity on North East India as well as a competitive cell corner. Several e-books and e-journals are also available in the library across all domain of academic pursuit through the campus network.

5. DSPACE:

DSpace is an open source repository software package typically used for creating open access repositories for scholarly and published digital content. It is basically used for academic, non-profit, and commercial organizations building open digital repositories. It serves as a specific need for digital archives system, focused on the long-term storage, access and preservation of digital content. DSpace preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets. And with an ever-growing community of developers, committed to continuously expanding and improving the software, each DSpace installation benefits from the next. Throughout the world, DSpace has a leading position among the various OSS being adopted for IRs/DLs. DSpace was found to be good open source software for the creation and maintenance of a digital library. DSpace has a number of preservation features including the ability for libraries to set preservation support by file type, checksums to ensure file authenticity, and persistent identifiers (Devakos and Toth-Waddell, 2008). The official website of DSpace (<http://registry.duraspace.org/registry>) provides information on DSpace installations over the world under “Who is using DSpace”. Currently the DSpace software and the user community receive leadership and guidance from DuraSpace, it is a joint venture of Fedora Commons. Salient features of DSpace are as follows:

- **Metadata:** Dublin Core metadata standard is used in DSpace for description of any item. Title, Language and submission date are the important fields and others are like abstracts, keywords, technical metadata, treated as optional. The metadata is used for browsing and searching the document.
- **User Interface:** Current interface of DSpace is Web based. There are few interface like one for submitter / author, and others engaged with submission procedure, other one for client, searching for information and third one for system administrators. The public interface support the end users for searching any item browsing by metadata.
- **Default Language:** The Dspace web application is available in 20 languages. One can customize the language according to the need and availability in Dspace
- **Workflow:** DSpace is the primarily open source digital repository created to handle the complex issues of how to accommodate multidisciplinary works. In other words, various communities, representing different department schools and labs, centre’s having different ideas of how to upload their digital content in DSpace, who will upload and what are the restrictions needed to follow regarding the type of material uploaded, who is the administrator to review and approve the

submission. All these issues are look after by the community representative working together with the libraries' DSpace user support staff, and are modeled in a work flow for each collection.

- **Import Export Data:** Import and Export for Communities, Collections and Items is upheld by DSpace. It additionally incorporates batch tools to import and export data in a basic registry structure, where the Dublin Core metadata is put away in a XML document. This might be utilized as the reason for moving substance amongst DSpace and different frameworks.
- **Statistics:** There is provision to create statistics for administrative uses. Statistical summaries are useful to analysis the performance of a repository. DSpace has the facility to create statistics on how many items uploaded, search by users and number of e-people registered with the system.
- **Technology platform:** Source code of DSpace was developed following terms and conditions of open source license so that institution and organization can download, install and customize it with minimal resources. It is design to run under UNIX operating system and some other open source tools & program developed by DSpace developer community. Original source code is available in JAVA high level programming language. Other technical support include relational database management system like PostgreSQL, web server like Apache, jena- an RDF toolkit, OAIAt from OCLC etc. Source code is available on SourceForge, a link from the DSpace informational web site and the HP lab site. As it is open source code, both MIT and HP are not responsible for any support to the adopter of DSpace, But DSpace continue to be improved by the technical persons of MIT libraries and HP and other institute using, MIT will take the responsibility for evaluating incorporating the new development into the main source code.
- **Technical Architecture:** Storage layer, business layer and application layer, these are three architectural layer of DSpace, each layer familiar with a application programme interface. This interface allows other to enhance its feature and customize as required by the institution. Storage layer is managed by PostgreSQL database table. The specific functionality of DSpace is resided in business layer, including work flow, content management, administration and other search modules. Last one is application layer that covers all available interfaces to the system; web UI and batch loader. Application layer gets more concentration for future development; generally add new services for new features.

5.1 Installation: D Space is freely available open source software which can be customized easily according to needs. An active community of developer, researchers, and users across the world contribute their expertise to the D Space.

5.1.1 Installation of D Space: The following steps were used for installation of D Space in RGU.

- i. Insert burn DVD in the DVD driver and restart the system.
- ii. After restarting press bootable key continuously (F12).
- iii. Go to boot mode and select CD/DVD and press enter
- iv. Click Install ubuntu and press enter.
- v. Select language English and press continue.
- vi. Select Erase ubuntu 14.04.5 LTS and installed.
- vii. Menu appeared and filled the name (dspace) along with password (library) for login was given.
- viii. System took 10-15 minutes for installation and finally clicked for restart.
- ix. Bootable CD/DVD came out automatically from the driver and the installation process has been ended.

5.1.2 Create e-people

- i. Open start menu
- ii. Click on System and tools
- iii. Click on Users and groups
- iv. Create three e-people Submitter, reviewer and editor.

5.1.3 Steps for creating Community & Collection:

i. The following steps were taken to create repository. Go to local **DSpace homepage** and clicked on **My DSpace** icon. Then login screen appeared.

ii. **Log-in name**–One has to create a dedicated e-mail account, e.g. Gmail, hotmail or yahoo, solely for uploading publications.

iii. **Creating a Top-level Community**–After login as an administrator on the top of the right there is an option to '**Create Top-Level Community**' by using the feature community/collection listing page. This option helps to create new 'Top level community' and 'Edit Community' page. Enter the name of top level community then click on create option.

iv. **Creating a Sub-community**–After creation of top level community next step is to create sub-community. Now click on the homepage of the community that is the parent of the newly created sub-community and click on the 'Create sub-community' at the top of the right handed corner of the page. Insert the sub-community name then click on 'create' option.

v. **Creating a Collection**– After creating sub -community, one has to start to create collection under the sub community, various main headings whichever relevant. For example, Journal articles, Conference articles, Book chapters, etc.

vi. **Describe the Collection** (Checkboxes) – Choose the relevant options as to describe the collection then click on 'next'. Write collection name, example Journal articles, conference articles, Book chapters, etc. After entering the collection name then click on 'update'. By clicking update, update page will appear.

vii. **Start uploading documents to DSpace collection**– On clicking the name of collection; it will take to uploading a document in to DSpace collection.

viii. **Click on submit to this collection** – Once logged in DSpace for submitting the documents, the submission steps will cover five steps to upload documents into DSpace. Such as: (1) Describe, (2) Upload, (3) Verify, (4) License, and (5) Complete.

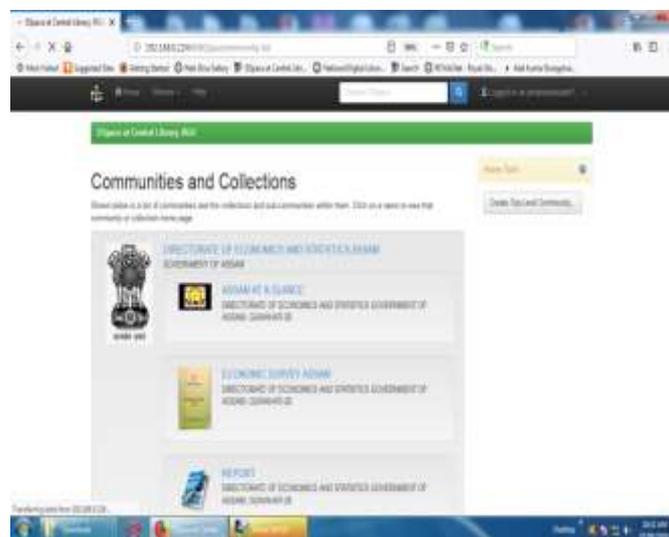


Fig 1. Screenshot of creating Top-Level Community



Fig 2. Screenshot of creating community under top-level community

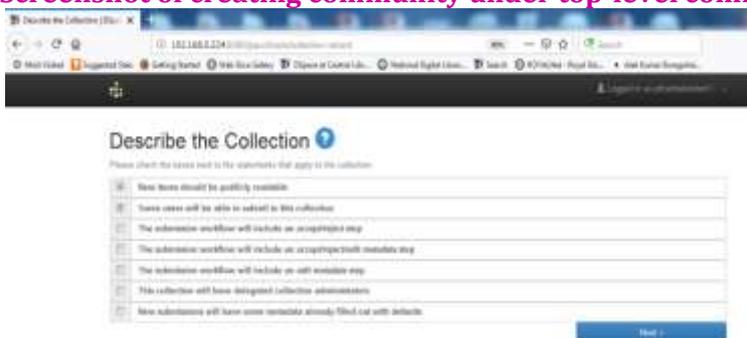


Fig 3. Screenshot of describing the collection during the process of submission



Fig 4. Screenshot of describing the collection during the process of submission

5.1.4 Customization of D Space LOGO

The Software has its own Logo but it can be customized according to our need. The following procedure is applied to change the logo.

- i. Open browser and search for logo according to our need.
 - ii. Save the logo under within home/webpage/jspui/image
Go to terminal and give permission giving following command:
Chmod -R 777/home/dspace/webapps/jspui/image/
- Copy the name of the original logo past that in downloaded logo and save
 - Come to the home page and refresh and accordingly logo will be changed.

5.1.5 Customization of the institute name

To display the name of the respective institute's name, we have to customize it accordingly. Following steps were followed:

- I. Log in DSpace
- II. Go to Administer
- III. Click on General Settings
- IV. Go to Edit News
- V. Select Top News
- VI. Click on Edit. In this step we have to enter the name of our institute's name in HTML tag. We can customize the name according to our wish by the help of html tags.



Fig 5. Screenshot of news editor to customize the Institute name



Fig 6. Screenshot of the HTML tags during customization

5.2 Technical platform:

• Architectural Overview:

DSpace is a set of cooperating Java web applications and utility programs that maintain an asset store and an associated metadata store. The web applications provide interfaces for administration, deposit, ingest, search, and access. The asset store is maintained on a file system or similar storage system. The metadata, including access and configuration information, is stored in a relational database.

• Service Providers:

DSpace has a global, active network of registered service providers who provided commercial support, hosting, training or site customization. <https://duraspace.org/dspace/resources/service-providers/>

• Technical Aspects:

Operating System is written in Java, tested under Linux, Windows, and Mac OSX

License: BSD

Release version: 6.0, <https://duraspace.org/dspace/download/>

Documentation: <https://wiki.duraspace.org/display/DSDOC/> Other prerequisite software: Java 7 or 8, Apache Maven, Apache Ant, Relational Database - PostgreSQL or Oracle, Servlet 3.0 container (Tomcat 7+ or similar).

- **Key Features:**

Application Architecture: DSpace is a full stack web application, consisting of a database, storage manager and front end web interface. The architecture includes a specific data model with configurable metadata schemas, workflows and browse/search functionality.

Modern, RESTful Web UI: DSpace 7.0 will feature a completely rewritten web user interface based on the Angular 2 javascript platform.

Built-in workflows: Originally designed for libraries, the embedded DSpace data model and approval workflows are familiar to librarians and archivists.

Built-in search engine: DSpace comes packaged with Apache Solr, an open source enterprise search platform that enables filtered (faceted) searching and browsing of all objects. The full text of common file formats is searchable, along with all metadata fields. Browse by interfaces are also configurable.

Unlimited File types: DSpace can store any type of file. In addition, it auto-recognizes files of most common formats (e.g., DOC, PDF, XLS, PPT, JPEG, MPEG, TIFF).

Metadata: By default, DSpace uses a Qualified Dublin Core (QDC) based metadata schema. Institutions can extend that base schema or add custom QDC-like schemas. DSpace can import or export metadata from other major metadata schemas such as MARC or MODS.

Tools/plugins: DSpace comes with a suite of tools (batch ingest, batch export, batch metadata editing, etc.) and plugins for translating content into DSpace objects. Additionally, commercial plugins are available through service providers.

Security: DSpace provides its own built-in authentication / authorization system, but can also integrate with existing authentication systems such as LDAP or Shibboleth.

Permissions: DSpace allows you to control read/write permissions site-wide, per community, per collection, per item and per file. You may also delegate administrative permissions per community or per collection.

Disaster Recovery: DSpace allows you to export all of your system content as AIP (Archival Information Packages) backup files. These AIPs can be used to restore your entire site, or restore individual communities, collections or items.

OAI-PMH / SWORD (v1 and v2) / OpenAIRE / Driver: DSpace complies with standard protocols and best practices for access, ingest, and export.

REST: DSpace provides RESTful APIs in accordance with modern web standards.

Configurable Database: Organizations can choose either PostgreSQL or Oracle for the database in which DSpace manages items and metadata.

Configurable File Storage: Files in DSpace can be stored either using a local filesystem (default) or a cloud-based solution, such as Amazon S3.

Data Integrity: On upload, DSpace calculates and stores a checksum for each file. Optionally, you may ask DSpace to verify those checksums to validate file integrity.

Languages: DSpace is available in over 20 languages.

5.3 Workflow:

A workflow is a step in between submission and archiving. It allows administrative input to submissions. Workflows are assigned to collections. A workflow is an optional process that items submitted into DSpace are put through. The workflow allows repository administrators to have an input to the items that have been submitted before they get formally archived within the repository. Workflows are assigned to collections. Each collection can have its own set of workflows. When an item enters a workflow step, the relevant users are sent an email telling them that they have a new task to perform. They can log in to their 'My DSpace' to see and take the task. The three workflows of DSpace are:

1. Workflow 1: Accept/Reject Step:

This step is used to allow a user to simply accept an item, or reject it. If they reject it, they can give a reason which will be emailed to the submitter. The item will appear back in the submitter's 'My DSpace' if it is rejected.

2. Workflow 2: Accept/Reject/Edit Metadata Step

This step is used to allow a user to either accept or reject an item, and edit its metadata. If they reject it, they can give a reason which will be emailed to the submitter. The item will appear back in the submitter's 'My DSpace' if it is rejected.

3. Workflow 3: Edit Metadata Step

This step is used to allow the user to edit the metadata. This might be done to correct the metadata, or to improve it.

Any or all of the steps may be used. Workflow steps are worked through in order. If step 1 and 3 are selected, step 1 must be completed before step 3 will be initiated.

5.4 Benefits to the users:

- **Largest community of practice:** According to Dspace.org "DSpace has over 1000 organizations that are currently using the DSpace software in a production or project environment. The most common use is by research libraries as an institutional repository; however there are many organizations using the software to host and manage subject based repositories, dataset repositories or media based repositories".
- **Open source platform:** As reported in the Dspace.Org "The DSpace open source platform is available for free to anyone and can be downloaded from the sourceforge open source software repository. The code is currently licensed under the BSD open source license. This means that any organization can use, modify, and even integrate the code into their commercial application without paying any licensing fees". Today there are more than 100 contributors around the world contributing code, bug fixes, etc.
- **Used by educational, government, private and commercial institutions:** The DSpace platform is used by higher education institutions for whom the platform was initially developed, while also showing a much broader appeal. The software has been used by museums, state archives, museums, state and National Libraries, journal repositories, consortium, and commercial companies to manage their digital assets.
- **Support Multi-Platform Operating System:** DSpace support multi operating system latest version; you can install on any system administrator like single Linux, MacOSx or Windows.
- **Manage and preserve all types of digital content:** The DSpace application can recognize and manage a large number of file format and mime types. Some of the most common formats currently managed within the DSpace environment are PDF, Word, JPEG, MPEG, TIFF files.

6. PROS AND CONS OF INSTITUTIONAL REPOSITORY AT RGU:

- **Pros:** It is a space for storing digital objects of all types created by the members of RGU along with contents of and on RGU. It allows the users to browse among all documents in a single platform free of cost. Question papers and syllabus are also uploaded for the sake of easy access by its users. It preserves the content in digital format for present and future members of RGU. It is seen that IR increases the reading and browsing habits of its members. They are curious to know about the researches and publications by their known ones. DSpace is providing them all those at a single window and thus helping in building a strong enthusiasm towards research related topics. Students are approaching to the faculty members to clear their doubts regarding how to start a research. It would not be possible to build this interest among students without an institutional repository and if possible, it will take a long period. We are getting a good collection of publications on an average basis due to this interest build up among the RGU staff. It also minimizes the rush of students in the Central Library asking for project reports and old question papers. Moreover, users can do advanced search according to their needs.

➤ **Cons:** There are some disadvantages of IRs too like every other thing. One of these is the constant power supply. Constant flow of power supply is very much essential for the smooth working of IR. Without which users will not be able to access the materials properly. Trained and skilled staff should be engaged in maintenance of IR with good knowledge of computer programming so that he can customize according to need. It should also be looked upon so that copyright is not violated by any of the members. We should not give access to edit to the general users apart from the admin staff. Moreover, strong internet connectivity is a must for seamless access of digital contents. If the documents are in print form, we need to scan it with the help of a good quality of scanner. For that, maintenance of scanners should also be looked upon seriously.

7. CONCLUSION:

We can conclude that it is not a very tough task to create a digital library in an institute. By creating a digital library we can know about each other's research works and can access them. We have customized a little according to our need but there are many scopes to customize and explore in DSpace which are in the process and will be implemented in near future.

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