

A Proposal For Building An Institutional Digital Repository: Stages And Obstacles From Librarian's Perspectives

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ABSTRACT

The current study proposes to build an institutional digital repository for Jordanian government universities that includes all forms of digital intellectual production issued by the university communities, and to make it available to the community at home and abroad by building a model for an institutional digital repository for Jordanian government universities. Through effective steps to build the institutional digital repository, monitoring the current reality of the intellectual production of societies. The study uses the descriptive method to achieve its objectives. The descriptive analytical approach was adopted for its consistency with the nature of the study, while the analysis was used to present the interview with the librarians, take their opinions and analyze the information collected through them about the university's digital repository project in order to reach results. The study found that there are many obstacles and difficulties facing the establishment of a digital institutional repository such as lack of awareness of institutional repositories, financial, technical and software problems, and copyright issues. The study has put some proposals to reduce or eliminate these obstacles in the recommendations.

Keywords: Digital Repository, E-Learning, intellectual property, Management, Institutional Repository, Librarian perspective, Pandemic, Jordan.

INTRODUCTION

University Campuses of 2020 suffered significantly when the World Health Organization declared Covid-19 a world pandemic. The COVID-19 is one of the highly infectious illnesses caused by SARS-CoV-2 or severe acute respiratory syndrome coronavirus 2 (Mishra et al. 2020). The disease is spread among people through close contact. The Coronavirus pandemic has affected many sectors, the most important of which is the education sector, which has completely transformed into distance education in all universities (Kennan, 2007). This transformation revealed many problems such as the lack of educational tools, the lack of the necessary technology, and the ignorance of a wide range of lecturers in dealing with technology related to distance education, in

addition to the lack of capabilities of many universities in Jordan and the world, thus the failure of education. The lockdowns have interrupted face-to-face learning because of the nationwide school closures, which have lasted for at least ten weeks (Kennan, 2007). As the country continues to implement measures to control the situation, there is a need for the open-access institutional digital repository to facilitate education throughout. Thus, there is a need to rethink, redesign and revamp the education system through building a cooperative open-access institutional digital repository responding to coronavirus pandemic. Based on Mishra, students and teachers need to embrace the digital academic experience as an alternative or complement the one-on-one teaching. The urgent need has emerged to form a cooperative union between universities to provide all possible means and resources to ensure the success of education in all educational institutions in the world (Kakai et al., 2018).

According to Anderson (2004), open access allows the reader of scientific information to access it through the internet, print, or distribute the material without restrictions or payment requests. Thus, under open access, the published materials are availed worldwide. They can be downloaded, copied, read, and freely distributed for research. However, a digital repository is required (Kennan, 2007). A repository is where multiple databases or files are kept for retrieval or distribution through the network. The value and necessity of Open Access are critical in the face of the Covid-19 pandemic. According to Islam & Akter (2013), open access repository would help students who cannot access face-to-face classes and information that would facilitate faster research towards discovering the cure for the Covid-19 virus. It also promotes continuity of learning and knowledge on compliance measures to curb the spread of the disease. Open Access can also significantly improve acquiring learning materials distance and blended learning. According to Islam & Akter (2013), the degree of visibility of study materials is high for open access because they are available on a massive scale. Moreover, the materials can be retrieved quickly and cited more frequently. Therefore, the research is based on each university setting up its repository. These repositories are linked together in a massive repository through a cooperative union, free of charge. Students and faculty members will benefit from their research, teaching, learning, and lectures. It will provide research, tools, educational programs, courses, lab experiments, discussions of MA and Ph.D., and theses in addition to seminars and conferences. This vast repository will contribute to the success of e-learning in all universities, especially the underprivileged ones, which suffer from a lack of materials and technological capabilities in the whole world. Open access enables users to access the information freely with minimum or no restrictions. Shajitha and Majeed (2019) highlighted that journals and repositories are the most prominent open access channel facilities. Institutional Repository (IR) is defined as the institutional offering of the services to its members for preservation, storage, management, and sharing of academic institution output (Helena & Chowdhury, 2020). The institutional repository aims to enable access to information freely. The digital institutional repository elevates the university's standing and raises its standing. This is ensured through the increase in the readings and the intensity of the reference citation concerning the intellectual production of researchers in the scientific community locally and globally, in addition to its role in the development of society. This repository assists in the scholarly output of

researchers for long-term conservation. Moreover, the institutional repository is the reproduced work made accessible for the public (Institutional repositories and intellectual property, 2013).

The technology can expand the knowledge shared to multiple users simultaneously. Materials transmitted through institutional repository include all intellectual production as articles, research, tools, educational programs, lectures, lab experiments, and discussions of MA and Ph.D. theses in addition to seminars and conferences research papers, pre-prints, research datasets, theses and dissertations, and digital monographs.

An institutional repository could contain any work product depending on the institution's objectives (Jamali & Nabavi, 2015). Institutional students, staff, faculty, and non-faculty researchers can generate the product through the institutional repository (Kennan, 2007). Therefore, apart from serving as an alternative source of information during the Covid-19 pandemic, the institutional repository preserves the scholarly information (Koutras & Bottis, 2013). It also aids the institution in increasing its visibility, public value, prestige and acts as a marketing tool for prospective students, staff, and financiers. Even before the emergence of the coronavirus pandemic, the institutional repository was primarily recognized for the vital role they play in scholarly communication (Jamali & Nabavi, 2015). Sci-Hub is one of the examples of a repository that somehow serves as a library but not like a search engine (Himmelstein, et al., 2018). The university manages the intellectual property rights of the production, the indexing of reference citations, and the authoritative control of the researchers' names for qualitative and quantitative analysis. This is done to measure the researcher's performance, given his added value and the disclosure of reference citations. By developing an IR, various institutes worldwide proclaim their contribution to the open access movement globally (Shajitha & Majeed, 2019). However, this seems to be limited for the Arab countries, particularly Jordan. Helena and Chowdhury (2020) further highlight that most IR is highly restrictive, making their future uncertain. The focus of this study is on Jordan, given the absence of information on the open-access university. This is evident from the previous research, which has been conducted on India (Shajitha & Majeed, 2019), Bangladesh (Rahaman, 2018), and Latin America (Costa, et al., 2019) though none in Jordan. To help bridge this gap, this research proposes building a cooperative open-access institutional digital repository at the Jordanian Universities.

The research institutions are mainly responsible for managing the repositories to ensure the authors' works are secured (Xie & Matusiak, 2016). Thus, scholarly communication can be promoted through the creation of institutional repositories. The open-access digital repository would provide an opportunity for students and other researchers to access essential research materials for their studies. The open-access online literature would be free of charge and most copyright restrictions (Koutras & Bottis, 2013). Institutional repositories are critical, especially during the coronavirus pandemic, because they are affordable and accessible to individuals so long as they can access the internet. Budapest Open Access Initiative recommends institutional repositories as one of the two routes to open access. The institutional repository closes informational gaps appropriately for students upon the closure of schools due to the COVID-19 Pandemic (Koutras & Bottis, 2013).

This study suggests creating an open-access, searchable, and interchangeable full-text digital repository by uploading all scientific publications for the faculty members on the universities' local networks. This allows each university community to search, read, copy, and retrieve from this vast repository while they are at the university without financial, legal, or technical barriers (Jamali & Nabavi, 2015). The intended purpose is to lay the foundations for building a digital repository that organizes, manages, and makes content available in the electronic environment (Koutras & Bottis, 2013). It is one of the Arab initiatives that seek to deal with the digital content of the intellectual production of faculty members systematically according to intellectual production in all forms.

Definition of the concept of open access and its initiatives

Online Dictionary for libraries and information science (ODLIS) Reitz (2014) defines open access as "Information content made freely and universally available via the Internet in an easy-to-read format. The publisher maintains online archives that provide free access or has deposited the information in a widely known open access repository. Open access is a new scholarly publishing model developed to free researchers and libraries from the limitations imposed by the excessive subscription price increase for peer-reviewed journals, particularly in the sciences and medicine. By breaking the monopoly of publishers over the distribution of scientific research, open access makes access to scientific information more equitable. It has the added advantage of allowing the author to retain copyright". The term (Open Access) "free access" was used in three public statements at the beginning of the twenty-second century in the Budapest Initiative for free Access in February 2002, then in the Bethesda Statement of Free Publication in June 2003, and in the Berlin Statement on the open crossing to scientific knowledge in October 2003.

The widespread availability of the Internet to the public in the late 1990s and early 2000s made the idea of free access possible. The free availability began by self-archiving previously published articles and creating magazines marked by free availability. Traditional magazines with unrestricted access covered the publication costs through entry fees such as subscriptions, site licenses, or pay-per-view. Some standard magazines also provide open access to their articles after a 6-12 months or more ban. In 2006, the European Commission recommended that steps be taken to open the way to free access to results of scientific research funded by the European Union. The European Consultative Council for Scientific Research (EURAB) has emphasized the importance of these recommendations. Accordingly, the OpenAIRE (Open Access Infrastructure for Research in Europe) Project has been established (Gargiulo, 2015).

Institutional Digital Repository

Anbu (2006) defined the institutional digital repository as "a digital collection of material published and hosted by an institution that owns and hosts it. In a more real sense, they are digital archives of an institution, the contents of which include the intellectual production created by institute members, whether they are employees, students, or faculty members. Witten et al. (2000) view the digital library as "A collection of digital objects, including text, video, and audio, along with methods for access and retrieval, and for selection, organization and maintenance of the

collection. Institutional repositories are digital groups embodying and maintaining the intellectual output of a single or multi-university community that provide an urgent response to two strategic issues facing academic institutions (Witten et al., 2016). These repositories include:

- Providing a critical component to reform the scholar communication system that broadens access to research reaffirms scholarship control by the academy, increases competition, and reduces journal monopoly. This eventually brings economic relief and increases the importance of institutions and libraries that support them; and
- It can serve as tangible indicators of the university's quality and demonstrate its research activities' scientific, social, and economic importance. Thus, increasing the institution's clarity, status, and overall value.

BACKGROUND

The notion of open access reflects the idea of unrestricted access to scholarly literary works or other published works for all those who have access to the internet (UNESCO, 2015). The academic results that are accessible without any restriction are found digitally on internet sites, and in return, people are not obliged to pay. Usually, the accessible content does not accompany the copyrights or license, etc. (Suber, 2007). Scholars asserted that open access repositories are valuable tools in adding up the networking among the institutions (Koutras, 2017). The researchers used the experimental approach and showed an important role for digital repositories in the educational process. However, Gunasekera's (2017) findings showed that the social sciences scholars had no familiarity with open-access publishing; Abdelrah-man's (2017) on Khartoum Institutional Repository showed that the use of repository is low; however, they view it as a valuable knowledge source. It suggests that there is a need to promote awareness among the students. Zainab (2013) found that through the electronic repositories, available archives, and electronic journals, the likelihood of the visibility and availability of the research works based on Malaysia can be enhanced among the populace of the scholars.

Further, it was recommended to increase the open-access electronic journals and re-search works concerning the emerging electronic communication. Similarly, the institutions were found reluctant to invest the resources for ensuring the availability of research work on-site. According to Adrian et al. (2018), only fifteen among ninety Presidents United to Solve Hunger (PUSH) universities followed open access policy for their published re-search work and waived off a license requirement. For instance, the University of California has formulated its policy that the public could access all the literary works by the university faculty without any restriction or requirement (The University of California. 2013).

Additionally, Attwel (2014) reviewed the global trends in building and designing digital repositories for children's books and their role in developing the child's culture. It identified the problems that arise in establishing repositories, such as those related to the server and the types and forms of purchased material. Hockx-Yu's (2006) study discussed digital storage issues and challenges faced by institutional repositories. It further aimed to clarify (JISC's view) on institutional repositories and their critical initiatives in assisting UK institutions to address these

issues. The study used a set of published works and JISC documents as reference materials. The findings indicate that digital preservation is a complex process where many problems remain unresolved. This leads to various difficulties for institutional repositories. However, the extensive deployment of institutional repositories also provides new opportunities for digital preservation. Various efforts can be initiated for digital preservation from an initial stage to engage authors and integrate digital preservation into the repository's workflow. This helps ease subsequent filing tasks. In addition, several ongoing projects funded by the Center were briefly reported, which explored various models for providing digital storage services for institutional repositories. These models may help to address the issue of long-term collective conservation in the context of institutional repositories, depending on the project results, further investigation, and prototype. This proposal presented in this paper would assist the reader in gaining a better understanding of issues related to digital preservation. It also helps analyze how JISC's work helped address these problems. It also clearly outlines JISC's view on digital repositories and their plan. This is important for the UK educational community, where JISC works on its behalf and responds to its needs.

Van Deventer and Pienaar's (2008) study entitled: "South African Repositories: Bridging Knowledge Divides" aimed at analyzing those (10) repositories from 2000 to 2008 and their role in the exchange of knowledge and open access to information. By analyzing software used in repository management and applied policies, the study mentioned some programs, such as Dspace, AHERO platform, and Eprints. The researcher recommends supporting strategies and projects for building institutional digital repositories and encouraging researchers and university faculty to contribute to the spread of knowledge. It shows that open archives increasingly influence the availability and selection of scientific and technical information.

Schöpfel and Stock (2008) presented a survey of literature in French open archives, for example, institutional and thematic digital repositories. The survey is based on a selection of 56 representative French digital repositories. These archives are selected from OAI repositories' national and international records, following a specific set of criteria. The repositories are described briefly (repository type, scientific field, programs, size, language, institution). Five aspects of each digital repository are analyzed. The first is the classification of documents (especially letters, theses, reports, conference proceedings, working papers, and educational curricula). While second is related to the part of literature in the entire archive (%), followed by specific metadata related to literature, quality control and policies (evaluation, validation), and conditions for accessing the full text. Digital repositories provide the preservation and dissemination of literature and contribute to its discovery. Jose (2007) recommends the creation of digital libraries in international scientific institutions through open-source software, using open-source software to build digital libraries as an excellent economical option in low economic conditions.

Christian (2009) and Ferreira (2008) studied the challenges facing and affecting digital repositories and their development, which were lack of awareness of the open-access digital repositories in developing countries, inadequate information and communication technologies infrastructure, lack

of funding as well as inadequate advocacy for open-access publishing, and issues relating to copyright management. The studies recommended organizing a series of conferences and capacity-building workshops to educate and train stakeholders and authors in academic and research institutions, and increasing funding from international donor agencies to help academic and research institutions in developing countries.

2.1 Study Problem and its Significance

The current study aims to build a model for the cooperative digital repository in Jordanian universities, which includes all forms of digital intellectual production issued by the university communities. This repository will be available to the communities, which helps strengthen the national and international research capabilities and support the development of knowledge accumulation, whereby some businesses are distinguished but neglected and unknown to all and are not managed in terms of storage, processing, publishing, and retrieving. In addition, it has been observed that there is no such tool that collects, organizes, and makes this intellectual production available in Al Hussein Bin Talal University and other universities in Jordan, and thus researchers are unable to access this important intellectual production.

We can see from table (1) ten Jordanian public universities, numbers of students who are currently in universities, numbers of academic staff who are currently in universities (UniRank. 2021), and approximate numbers of the intellectual production of each university, and an approximate number of theses for all universities which are (150,000) (University of Jordan, 2021), the presence of higher education and distance education in all universities, the approximate volume of intellectual production only for faculty members who are currently in universities is approximately (38,000-75,900), but in fact the volume of intellectual production of faculty members is much greater than this number, as the University of Jordan was established in 1962 for example, and other universities were also established a long time ago. All this number of current students (157,000-190,990) are required to complete research or graduation projects, but these researches are not kept and organized to become visible and become available to everyone for research and retrieval. Also, the existence of distance education gives greater importance to the establishment of an electronic digital repository that will be available to students from a distance to help them understand materials and implement assignments, research, and university theses.

Table 1: Public universities

Public universities	Year of establishment	No of students	No of academic staff	Distance Learning	Higher education	No of intellectual production	No of Theses In all uni
University of Jordan	1962	35,000-39,999	1,000-1,499	Yes	Yes	10,000-10,499	150,000
Science and	1986	20,000-24,999	800- 899	Yes	Yes	8,000-8,990	

Technology							
Yarmouk	1976	30,000-34,999	1,000-1,499	Yes	Yes	10,000-10,499	
The Hashemite	1991	20,000-24,999	700- 799	Yes	Yes	7,000-7,990	
Al-Balqa' Applied	1996	5,000-5,999	200- 299	Yes	Yes	2,000-2,990	
Mutah University	1981	15,000-19,999	500-599	Yes	Yes	5,000-5,990	
Al al-Bayt	1993	15,000-19,999	300-399	Yes	Yes	3,000-3,990	
German Jordanian	2005	4,000-4,999	300-399	Yes	Yes	3,000-3,990	
Al-Hussein Bin Talal	1999	9,000-9,999	300-399	Yes	Yes	3,000-3,990	
Tafila Technical	2005	4,000-4,999	700-799	Yes	Yes	7,000-7,990	
Total		157,000 - 190,990	3,800-7,590	Yes	Yes	38,000-75,900	150,000

Educational tools, books, programs, recorded lectures, lab experiments, discussions of master's and doctoral theses, seminars, conferences, and articles will promote and improve e-learning in all institutions, especially the underprivileged ones in Jordan and internationally. The importance of the study stems from the increased interest in the intellectual production of faculty members in all universities in various forms. This necessitates attention to the international trend in all universities in Jordan to build a cooperative digital repository in universities as one of the most important tools for gathering specialized information resources for development and upgrading research and learning.

METHODOLOGY

The current study proposes to build an institutional digital repository for Jordanian government universities that includes all forms of digital intellectual production issued by the university communities, and to make it available to the community at home and abroad by building a model for an institutional digital repository for Jordanian government universities. through effective steps to build The institutional digital repository, monitoring the current reality of the intellectual production of societies, and proposing recommendations that enable the construction of the repository. The study uses the descriptive method to achieve its objectives. The descriptive analytical approach was adopted for its consistency with the nature of the study, where the

description was used to give a comprehensive view of the subject being studied, while the analysis was used to present the interview with the librarians, take their opinions and analyze the information collected through them about the university's digital repository project in order to reach results.

Study sample

The individuals who have a close relationship with the subject of the research, and they are the librarians responsible for managing databases in the libraries of the ten public universities in Jordan.

Limits and scope of the study

Objective limits

The current study aims to propose building an institutional digital repository for Jordanian government universities that includes all forms of digital intellectual production issued by the university communities, and making it available to the community at home and abroad by building a model for an institutional digital repository for Jordanian government universities that includes all forms of intellectual production in the full text through steps Effective for building the institutional digital repository, monitoring the current reality of the intellectual production of societies, and proposing recommendations that enable the construction of the repository. The study uses the descriptive method to achieve its objectives. It suggested a scenario for the requirements of establishing a digital repository on the university's local network and sharing all resources through the cooperative union.

Formal boundaries

The study includes intellectual production of various literary types and various forms of books, periodicals research, patents, recorded lectures, etc.

Time limits

The study was conducted during the first semester of the year 2020-2021, but the intellectual production includes all production since the establishment of the university until now.

Stages of establishing an open institutional digital repository (IDR)

The development stage of the IDR is indicated in Table 2 below:

Table 2: IDR Development Stages

Stages	Description
First Stage	Definition of the institutional open repository

Second stage	Changing the culture of society
Third stage	Identifying previous international experiences and is linked to institutional survey
Fourth Stage	Determination of the technical requirements
Fifth Stage	Determination of the financial requirements
Sixth Stage	Defines teamwork and training as well as qualifies them
Seventh Stage	institutional repository interfaces
Eight Stage	Launch of the institutional open repository
Ninth Stage	Institutional repository operation
Tenth Stage	Evaluation of the digital repository

First stage

This stage defines the institutional open repository, its need and its digital content on the internet (Landis et al., 2009).

Second stage

This stage focuses on the cultural change of society and its attitude towards open access and the open repository, which is more complicated than building the repository it-self, and it can be changed through three levels (Barton & Waters, 2004; Bankier et al., 2009).

Intellectual side

Introducing the repository, its importance, benefits, goals, and awareness that digital repositories have become an urgent necessity to keep pace with scientific progress.

Emotional side

To create a repository, we must address the hearts and minds of the importance of the topic and its impact on free access to information and benefit from it without legal, financial, or technical obstacles.

Administrative side

The university obliges all researchers to deposit their scientific production in the dig-ital repository to keep pace with international trends in free access to information. The in-stitution's ability is measured according to the scientific data on the Internet.

Third stage

This stage focuses on identifying previous international experiences distinguished in establishing digital repositories and best practices and documenting them, joining the membership of supporting international institutions such as the International Federation of Free Access Repositories, and participating in international agreements and treaties for free access (Bankier, et al., 2009). It further includes surveying each institution to understand its conditions, capabilities,

and human, administrative and technical needs. And learn from local experiences and their conditions; an estimated implementation period for subsequent tasks can be established through the results obtained. It is also linked with the organizational stage in building the institutional digital repository is represented in setting policies as the framework that defines the repository's work and clarifying the legal aspects related to its work. And these policies are:

The content policy, which defines the scope and coverage of the digital repository, taking into account its goals and plans, and the institution's policy, so the following areas must be defined: The subject area, which are the topics to be included in the repository, languages for the documents, time and spatial range, determines the type of documents, which are all scientific publications such as research, books, conferences, theses, educational documents, audio-visual materials, recorded lectures, and patents. They all documents since the university's founding in all languages and types and formats and topics and determine whether the documents were before publication, after, or before and after.

Deposit and intellectual property policy, the deposit may be a self-deposit by the authors or a deposit by the repository staff, or it may be possible to merge the two methods by depositing the researcher with his document without publishing it until the approval of the repository management that reviews the data, corrects errors and completes the data in the event of its lack and then publish it. The copyright of the materials in the warehouse must be determined, the responsibilities of the backup and the guarantee of permanent availability. If the author wants to deposit his work in the digital repository and publish it, he should write directly to the publisher to request permission to deposit the work. The content organizing policy (metadata) is as follows:

- a) Determine the reliable metadata standard in building metadata for institutional repository content such as the Dublin Core standard,
- b) Metadata policy during digital depositing where the required metadata is determined and its elements are author name, title, title, description, publisher, date, citation, series number, report number, source identifiers, source type, format, language, keywords, summary, and funders,
- c) Metadata policy after digital depositing: determine the person responsible for controlling metadata provided during the depositing of digital entities and other metadata to complete the related digital entities is determined according to the standard.

All repositories adhere to the same standards and also use the Z 30.50 standard for data exchange. A policy for controlling the quality of digital content where it is determined whether the digital content:

- a) Meets current and future needs and is widely interchangeable across different systems,
- b) Has a persistent identifier,
- c) Has descriptive, structural and administrative metadata, the rights management metadata and preservation metadata.

Digital content preservation policy: The storage plans to be adopted by the repository that is closely related to the content policy must be defined. The preservation policies can be summarized in (Strodl, et al., 2007):

a) Preservation period, where documents are divided according to the preservation period into documents that will be kept in an unknown manner, documents that will be kept during a specific time, documents that will be kept permanently, and documents that will be kept on demand.

b) The acceptable formats for deposit and preservation, and then preservation, must be clarified, and the policies should answer the following questions:

- Will the repository guarantee that the files are readable and long-term usability? What is the solution to ensure that files are read in case the program is gone?
- Will the repository be bound when displaying digital documents in the format set by the programs that created the document?
- Will the repository convert files from one format to another in a way that is appropriate for the preservation process? Will the repository keep the original and the converted format?
- Will the repository accept compressed files, and will it compress the files?
- Are there restrictions on the size of files?
- Will the repository store multiple copies in different formats?
- Dissemination and accessibility policy for digital content: Although warehouse goals are to increase access to information, the access policy must specify the access method as follows:
 - a) Will the repository pursue a free open access policy?
 - b) Will the repository pursue a controlled access policy? What is the method used in that? Will it be according to the type of document, by the user, or by the number of users?
 - c) Will the repository pursue a restricted access policy?
 - d) Will the repository use the registration policy to view and download digital content?

Fourth Stage

Determination of the technical requirements for building the institutional repository is based on the following requirements (Repanovici, 2011). Hardware devices, which are computers with high specifications and necessary equipment, such as printers, scanners, digital cameras, and communications network equipment, etc. Software installations: There are a lot of repository building systems, and they differ in their capabilities and specifications. The choice of the repository system is one of the most important steps in building digital repository and are systems for storing or managing digital collections, these systems can be obtained by purchasing and paying consulting fees, but the source code remains with the provider, or get an open-source system, as it allows the source code of the system and can be modified and changed, and this option is the most widespread, Dspace and Eprint are examples of these systems and have many advantages. Systems can be obtained by Software Service Model; these are systems that the provider owns and hosts and manages the system in addition to other services. Or a local system can be built by programmers inside the university.

Fifth stage

This stage determines the financial requirements, adequate financial support must be provided to the repository so that we can provide all the equipment for the project to succeed (Bankier, et al., 2009).

Sixth stage

It is centered on defining the teamwork, training and qualifying it. The focus is on teamwork, and it is the backbone of the institutional repository and has many functions and tasks, and should have a job description, the organizational structure of the digital repository can be illustrated as follows (Clobridge, 2010) :

- A supervisor of the digital repository manager who supervises the administration and all the processes and procedures related to it from the establishment of the repository until the provision of services and determines the policies and future strategies of the repository.
- The institutional repository manager handles all administrative and technical operations of the warehouse. It manages the institutional repository budget, strategy development and cost calculation for future development, repository services and defines the goals of the strategies, solve work problems, and study the needs of the users to improve the repository services.
- A digitization specialist who undertakes the task of converting all forms of entities into digital form. He should be aware of the latest developments in the field of digitization and digital projects and can deal with different digitization devices.
- Programming specialist and network technician and he should be able to deal with different operating systems and download. It deals with digital repository programs, design, and test users' interfaces and develops users' services.
- The digital content collection specialist is responsible for the procedures for digital depositing and must be familiar with all types and forms of digital content and has knowledge of depositing and intellectual property issues in the digital environment.
- Metadata specialist with knowledge of identifying and developing metadata properties and any other standards and able to continuously control the quality of metadata for digital entities.
- Training and qualifying the work team as it reflects on the performance of the work, the most important training courses to develop the skills of the team are:
 - The course of digital content management and the definition of digital content management programs in digital repositories on the Internet and the definition of criteria for evaluating these programs and how to download and benefit from these programs.
 - The course of digital photo and video capture teaches them how to take pictures and ensure the quality and accuracy of pictures.
 - The course of building digital content introduces them to digital content, its types, forms, importance, how to build it. It also introduces them to global standards for its construction.
 - It is linked to the digital content metadata course. Participants gain knowledge about organizing digital content in digital repositories, types of metadata and their standards, and how to place metadata for digital content after it is deposited in the institutional repository and quality control of metadata.

- The course on managing intellectual property rights in the digital environment introduces participants to managing intellectual property rights in the digital environment. It is related to laws, such as how the author obtains permission from the publisher to publish the work in the repository and learns about the rights of depositors and institutional repositories.

Seventh stage

It focuses on designing the institutional repository interfaces, including (Jones, et al., 2006):

- Registration interfaces, i.e., data required during registration, include name, major, department, function, e-mail.
- The content repository interface in the repository includes a welcome to depositors, an authorization to deposit and how to deposit and a link to start the actual deposit, then storing it in the database.
- Management interface to support group management and preservation activities.
- Browsing Interface for searching and retrieving content.

Eighth stage

After making the necessary links between the repositories and testing the interfaces, the launch of the institutional open repository on the internet. The repository will be launched online through advertising media, on the university's website, and through marketing through posters, audio-visual, and on the billboards in colleges and arenas, among other means (Nagra, 2012).

Ninth stage

It is operating the institutional repository on the internet. It deals with the offerings of the services and feedback and receives suggestions, complaints, and comments from the beneficiaries. It also integrates the experience in digital repositories on the internet. It is possible to make questionnaires and questions and send them to the Hussein University community through the site or via e-mail (Dlamini & Snyman, 2017).

Tenth Stage

The tenth stage is the evaluation of the digital repository. This stage is performed by the beneficiaries of the repository and employees and through comparative evaluation studies with other digital repositories that preceded or followed this project. The digital repositories are evaluated according to a set of standards, such as (Thibodeau, 2007; Quisbert, 2008).

Compatibility

Support for browsers, support for web outputs for content, support for client and server operating systems, support for web programming languages, and standard data-base.

Security encrypted passwords for database users and authenticated users using passwords, check content, check login and log out. Support for open standards, including XML data and XML conversion, support for successive CSS style sheets, support for sending e-mail through a standard

SMTP server, and support XHTML output. Metadata: Link to metadata, Creating and modifying metadata, Collecting metadata, Metadata compatibility to all forms of information resources.

Content editing

Browser-based word processor, dictation checker with dictionaries, support for the inclusion of images and hyperlinks to content, support for uploading photos and files from the web browser directly to the warehouse management system, enables users to download, export, modify and categorize the content.

Accessibility requirements are as follows:

a) Internal access: Users should be able to search for content by metadata elements and able to browse digital content, and to provide a system for searching with full texts and the possibility of searching through factors of Boolean logic, and to show users the intellectual property rights during viewing the documents and provides assistance system. External accessibility: the system offers accessibility by Z39.50 standard, OAI-PMH standard, and other standards for delivering content and metadata through web services and provides a reference link for digital content.

b) Display: The system interface should be compatible with the Unicode Standard; the system allows users to provide feedback to the system's problems, and the system can provide statistics and reports.

c) Preservation: The system should store metadata records separate from digital content, the system can save and store different file formats, and it saves file data such as original file names, size, and date.

Evaluation of the digital repository combines qualitative and quantitative methods such as surveys, interviews, and focus groups by identifying strengths, supporting them, identifying weaknesses, and taking actions for effective handling.

RESULTS

Obstacles and problems of the digital repository

Regarding the obstacles, and reasons for the lack of institutional repositories in the universities after reviewing the previous literature it was found that all institutional repositories face the same challenges. Respondents' -who are librarians from 10 university libraries- answers were as follows: - depositing intellectual production: With regard to university theses and dissertations, libraries do not face any problems in depositing because it is mandatory and the Deanship of Scientific Research undertakes this work. As for the rest of the sources of information produced by faculty members (such as books, articles, and conference research), if the university administration does not impose on authors to deposit them in the digital repository, it will not be available, and therefore the digital repository will be distinguished by its weak contents and is limited to university theses only. The authors' lack of awareness of institutional repositories and the importance of open access is one of the reasons behind their refusal to deposit their scholarly work, which was found in previous studies (Ferreira, et al., 2008). It is possible that the reason for not

depositing works in the digital repository causes an additional burden on faculty members, so they must be motivated and given rewards for this additional work, and it is possible to make the deposit a requirement for their promotion. The lack of awareness of institutional repositories and open access among librarians and decision-makers and their rejection of change is a severe obstacle to the development of institutional repositories in universities. To solve this problem, it is possible to benefit from the experiences of successful projects such as the Minho University project (Ferreira, et al., 2008), which overcame the problems of slow adoption and the low deposit rate by adhering to a set of measures: 1) developing a comprehensive promotional plan; 2) Developing valuable services for repository users. 3) Dealing with the international community. 4) Implement a mandatory self-archiving policy in addition to providing a financial incentive to promote self-archiving.

-Technical problems related to the policy of preserving information resources deposited in the digital repository in the long term, as the problem of storing them will arise as their volume increases, and the high volume of contents will make it difficult to retrieve information. This problem is caused by the use of servers with weak capabilities in universities, so it is necessary to buy servers with high capabilities to solve the problem of storage and Internet speed. Problems with Technology infrastructure are represented also in the low internet bandwidth availability and outdated computers in most universities. This problem occurs in most developing countries because it requires large capital, but budgets are limited (Gibbon (2009). It is the responsibility of the government to confront these challenges by establishing an integrated program similar to the programs of developed countries. Given the successful global experiences, the Portuguese government has implemented a national program aimed at building infrastructure, services, and communication networks to facilitate the production and exchange of knowledge between university students and teachers within Portuguese universities (Ferreira, et al., 2008).

- Problems related to the software that will be used to create and manage the digital repository, will the software be purchased, or will a free, open-source software be used, as the library's budget is very limited. Will the program be compatible with the integrated automated library system? Will we be able to deal with it? There are many free and open source programs with good features and good characteristics such as DSpace and other free programs that we can use instead of expensive programs. According to Tansley et al., (2003), DSpace is an open source system that serves as a repository for digital research and educational materials produced by an organization and provides all the essential features required by a digital repository service. DSpace is intended as a base for expanding repository functionality, in particular to address long-term preservation concerns.

- Financial problems and difficulty of providing permanent financial support to the repository; the construction of institutional repositories has many requirements such as training workshops, equipment, and staffing, as well as information and communication technology and other requirements, all of which have a relatively high cost for libraries with a limited budget. Increased funding is needed from the government and international donor agencies to assist universities and educational institutions as Gibbon (2009) recommended.

- The problem with copyright is a common problem in all digital repositories, the process of making works available in full text often requires obtaining permission from the original publisher of the work, and this process often requires a long time this constitutes an obstacle to the flow of work, and the process becomes more complicated when the owner of the work does not allow publishing it electronically. In addition to the ignorance of the faculty members about copyrights and their fear of legal accountability if they deposit their work. So we should provide guidelines related to copyrights to faculty members and researchers, negotiate publishers, and the use of digital rights management technology, but it also requires an additional cost.

CONCLUSION

The digital institutional repository elevates the university's standing and raises it by increasing the number of readings and the intensity of the reference citation. It will contribute to improving and upgrading the international ranking of universities, and the failure to adopt and efficiently activate a digital repository project hinders the development of scientific research at the universities. It helps enlighten the intellectual production capability of researchers affiliated in the scientific community, locally and globally. It allows faculty members and students to find educational materials and lectures needed for e-learning. The development of the institutional repository is necessary and accessible for the intellectual production of faculty members. Given the significance of the repository globally, the university staff should be encouraged to deposit their research to enrich the digital repository. Moreover, all universities must be urged to create cooperative unions and consortia to make all information available for researchers to disseminate knowledge in society and promote learning. There are many obstacles and difficulties facing the establishment of a digital institutional repository such as lack of awareness of institutional repositories, financial, technical and software problems, and copyright issues. The study has put some proposals to reduce or eliminate these obstacles in the recommendations. This study was from the point of view of librarians. It is possible to conduct a survey and take the opinions of researchers and faculty members about their readiness and attitudes toward the digital repository.

RECOMMENDATIONS

- Benefit from the successful experiences of digital repositories and consult those in charge of them before starting the implementation of the project.
- Encouraging the principle of free access to raise the institution's rank globally and increase its visibility.
- Attention to the quality of metadata and the use of subject headings and codified scouting terms for accuracy and validity of retrieval.
- Taking into account quality control and attention to the existence of organizational policies for work within the repository.
- Existence of a systematic and continuous marketing plan for digital repositories using various means.

- Developing a repository in line with the actual needs of the university community, such as providing the necessary retrieval entries.
- Applying the international standards to ensure the quality of the digital repository.
- Introducing and qualifying librarians and faculty members to the importance of open access and institutional digital repositories and encouraging them to deposit their scientific production through a series of workshops and conferences focusing on active training on open access and its software and other issues related to creating an institutional repository such as metadata, copyright, policies, and marketing for institutional repositories and other issues. The National Library and the Director of the Association of Jordanian Universities (Center of Excellence) should have a leadership role.
- Providing an information and communication technology infrastructure and; the development of open access institutional repositories requires the provision of fast and reliable Internet in universities as well as information and communication technology, as most teachers and students use the local university network for research and teaching within the university.
- Increased backing for libraries by providing sufficient financial resources to build and manage the digital repository, and providing qualified human resources to build and manage the digital repository.
- Providing guidance assistance to authors to clarify the method of deposit and use in the digital repository.
- The institutional repository should negotiate the right from the journal publishers and use digital rights management and fair use for information to maintain copy-right in a balanced way while preserving the right of researchers to obtain information.
- Increased backing for research on digital institutional repositories and Studying the awareness and readiness of faculty members and librarians in digital institutional repositories through practical research and survey.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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