LESIJ - Lex ET Scientia International Journal. 2008, Vol. 15 Issue 2, p98-112.

ISSUES IN KSU FACULTY PUBLICATION ARCHIVING & ACCESS

Prof. Reima Al-Jarf
King Saud University, Riyadh, Saudi Arabia

Abstract
The present study examines the King Saud University Repository (KSUR) and explores how documents are collected, classified, curated and preserved, and how the digital content is accessed. Although the repository has a total of 48789 file URL's, the proportion of faculty's full-text publications contained in the repository is very small. Faculty publications are stored in folders and subfolders, which are given serial numbers, not fields and subfields. Documents in the KSUR cannot be accessed through the university library website and no link to a special website with a main page, simple and advanced searching tools and multiple keyword narrowing options is available. Faculty publications can be only accessed through Google or Google Scholar by using an author's name as a search term. The Arabic document content is unreadable and 70% of an abstract is simply deleted. When articles uploaded by the faculty in PDF format are located in Google or Google Scholar, they appear in WORD not PDF format. Use of faculty publications is not protected by copyright law. Detailed results are reported and recommendations for storing, retrieving, and accessing the KSUR are given.

Key words: *KSU repository, metadata, access, searching options, digital documents, digital archives.*

Introduction

An Institutional Repository (IR) is an online locus for collecting, preserving, and disseminating the intellectual output of an institution. It includes research journal articles, preprints and post prints undergoing peer review, and digital versions of theses and dissertations, administrative documents, course notes, or learning objects. A repository is also a place where multiple databases or files are located for distribution over a network (Bruce, 2005; Wikipedia).

The primary purpose of an IR is to help create global visibility for an institution's scholarly research, collect content in a single location, provide open access to institutional research output and metadata, store and preserve other institutional digital assets such as unpublished dissertations or technical reports. Institutions see repositories as a way of displaying their output. They enable easy access to research outputs and link e-prints to other working papers and datasets within an institution (Bruce, 2005; Wikipedia). Repositories are important for helping universities and colleges manage and capture institutional assets as a part of their information strategy. A digital repository can hold a wide range of materials for a variety of purposes and users. It can support learning, research and administrative processes. Colleagues use repositories to share and re-use learning and teaching materials (Hayes, 2005).

Within teaching and learning, IRs ensure the availability of content to improve the quality of the learning experience and cater for different learning styles among the students. Repositories could stimulate culture change in teaching and learning, as instructors have to review how they deliver their courses and focus on the improvement of the quality of the learning experience (Hayes (2005).

Repositories are just a new technology (Bruce (2005). When asked how long their IR has been operational, 52.1% of respondents with operational IRs cited 12 months or less, 27.1% from 13 to 24 months, 4.2% from 25 to 36 months, and 16.6% for more than 36 months (Markey and others, 2007). Pilot tests and operational IR's were very small. It was

also found that 80% of the pilot-tests and 50% of the operational IR's contained fewer than 1,000 digital documents. Only 8.3% pilot-test IRs and 19.4% operational IRs contained more than 5,000 documents (Markey and others, 2007). With the rapid increase of IRs, material is now stored in an institutional rather than a national repository. National repositories are 'harvesting' institutionally based digital material for storage in their national repositories.

For the above reasons**,** many academic libraries are actively involved in building IRs of the institution's books, papers, theses, and other works which can be digitized. Research universities lead in the implementation of IRs. Since 2004 rapid growth in IRs has been seen. In 2004, there were 40 IRs in the U.K. Out of the top 20 research institutions, 15 had IRs, others were being planned (Bruce 2005). Of the 446 academic library directors and senior library administrators who participated in the MIRACLE Project, 52.9% had done IR plans, 20.6% were only planning for IRs, 15.7% were actively planning and pilot testing IRs, and 10.8% implemented an operational IR (Markey, Karen; Rieh, Soo Young; St. Jean, Beth; Kim, Jihyun; & Yakel, Elizabeth, 2007).

In the UK, the Joint Information Systems Committee (JISC) (2005) carried out the MIDESS Project to explore the development of a digital repository infrastructure, the management of digitized content in an institutional and cross-institutional context. For that purpose, an on-line questionnaire was designed and publicized throughout the MIDESS partner Universities: The University of Leeds, University of Birmingham, London School of Economics (LSE) and University College of London (UCL). The goal of the online questionnaire was to identify how respondents were creating, storing and using digital material; to identify the digital content created by academics; to define the level of expertise in creating and using digital material; and to explore the requirements of creating and using digital material. It was found that a large number of respondents had either used or developed digital material. The technology used to create digital material was sufficiently mature and many university staff felt confident in creating their own digital content without requiring a lot of support. Results also revealed the need for developing digital repositories to assist with the management of digital content at the departmental and institutional levels. Key requirements included the ease of adding digital material to the system, availability of long- term storage, the ability to password-protect or restrict specific digital collections, the ability to search across collections, managing metadata schemas effectively, and providing easy access to digital material, and provide support throughout the entire digitization, storage and material location process.

The Library Consortium of New Zealand (LCoNZ) launched a project to establish a multi-institutional research repository to support the Auckland University of Technology (AUT), University of Waikato, Victoria University of Wellington, and the University of Otago libraries working collaboratively to implement an Information and Resource Access Management System (IRAMS). The Project Report made a number of recommendations to ensure that LCoNZ is moving forward with IRR applications in a collaborative way while acknowledging the immediate needs and priorities of each member institution. Those recommendations included: (i) Preparing a Phase II Project proposal with the expectation that DSpace is the most feasible open source digital repository software system for the majority of LCoNZ member institutions, (ii) involving information technology (IT) Directors from each member university to assist with the preparation of the Phase II Proposal and in particular to articulate the advantages, disadvantages and cost estimates of a shared, remotely hosted technical solution and (iii) to meet the immediate needs of each university in the interim period before a functioning LCoNZ solution becomes available (Shepherd (2007).

A yearlong study of faculty members at the University of Rochester has revealed some of the reasons why current IR systems are more useful in theory than in practice and has resulted in modifications to the University of Rochester's implementation of the DSpace

repository software code to better align the repository with the existing work practices of the faculty. The findings have also caused a complete rethinking of how to explain and promote the IR (Foster & Gibbons, 2005).

In Riyadh, Saudi Arabia, King Saud University (KSU) launched a new portal in September 2007. A website with standardized components and tools was created for each of the university's 4600 faculty members in its 32 colleges using the Microsoft Sharepoint software. To help disseminate knowledge, the university faculty were requested to upload their publications, conference presentations, course materials and reports in PDF format, which were then archived in a pool of documents, i.e. the KSU Scientific Repository (KSUR) (http://reference.ksu.edu.sa). The KSU Scientific Repository is a rich source of documents and publications. It contains conference presentations, IT papers, KSU journals, research material from the different disciplines in HTML format. Each folder contains self-explanatory subfolders that contain lists of scientific documents and presentations.

The present study aims to describe the following: (i) Whether the KSUR is publicized; (ii) the KSUR administration; (iii) the KSUR content (who is in charge of document supply, input and output formats, kinds of metadata information provided, sharing of digital content, and copyright issues); (iv) how the KSUR is accessed and what searching tools and narrowing options are available; (v) types of technical support and help provided. A sample of randomly selected faculty websites will be examined to find out the frequency of citations, abstracts and full-text publications and conference presentations stored in the repository. The author will search for documents and examine the types of content, file formats**,** and how digital content is collected, classified, cataloged and preserved. She will examine maintenance, cost, and determine the KSUR system's functionality aspects.

Although the KSUR was created less than a year ago, answers to the above issues will help determine how successful the KSUR implementation has been and whether there is a need for improved functionality. The KSUR policies may not be in place at the time of its public launch. Taking a wait-and-see attitude, evaluating what transpires after a period of time, then firming up existing policies and implementing new ones as needed may be the most expedient course of action.

Subjects

The KSU Repository administrator, 64 faculty members were randomly selected from the 32 colleges at KSU (2 professors per college), and 10 randomly selected faculty websites.

Instrument

Based on the results and recommendations of prior studies by Bruce (2005), the MIDESS Project (2005), Hayes (2005), Shepherd (2007), and Markey, Rieh, St. Jean, Kim, Yakel (2007), a list of Repository features, tools and functionality requirements was made. The KSUR aspects examined included the following: (i) Publicity; (ii) KSUR administration; (iii) content (who is in charge of document supply, metadata information, input and output file formats, copyright, collecting, classifying, preserving digital documents, security and back-up of material, sharing digital content policies); (iv) accessing the digital content and searching tools; (v) technical support, help tools, maintenance, preservation, cost, the system's functionality and storage.

Data Collection and Analysis:

Data were collected using the following procedures: (a) The KSU Scientific Repository administrator was interviewed. (b) The 58 professors were also interviewed to see if they have heard of the new KSU Scientific Repository, if they have used it and what their experience accessing and searching it was like. (c) I performed a content analysis of the KSU Scientific Repository. An actual search in the Repository for the publications and documents of 10 KSU faculty including myself was conducted to determine its functionality. Percentages as well as qualitative accounts are given.

Results and Discussion

Results are reported with regards to several KSUR issues: Publicity, administration, content, access and searching, technical support and help issues.

Publicity Issues

All of the KSU faculty members surveyed in the present study reported that they were unfamiliar with the KSUR, had a poor understanding of file formats, and that they struggled with Repository access through the web.

Administrative issues

Only one computer engineer is in charge of the KSUR. Library staff are not involved in managing the Repository. The administrator has no background in library science and Repository issues. The creation of the KSUR was not intentional. It is a feature of the Sharepoint software where all document links are stored in a locus on the university server. The university has not developed a records storage plan and has not established policies for creating, approving, and enforcing records, including a classification system and a records retention policy. Documents are not classified and stored according to standard operating procedures. The university has coordinated access and circulation of records outside but not within the university. Every month a data map of the new faculty documents is submitted to Google. However, faculty can neither access nor search the Repository through the university portal or library website.

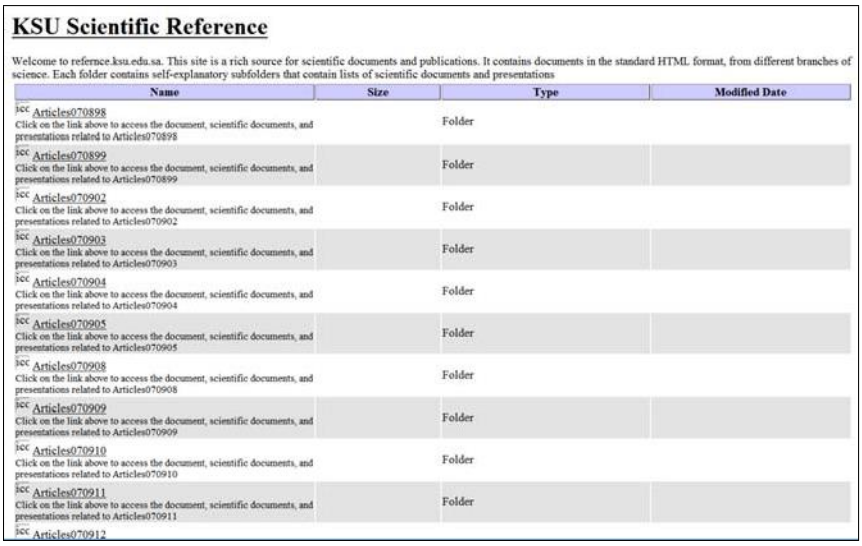
These finding are inconsistent with findings in the Repository literature. For example, Markey, Karen; Rieh, Soo Young; St. Jean, Beth; Kim, Jihyun; Yakel, Elizabeth (2007) found that at least 60% of the have implemented policies for (1) acceptable file formats, (2) determining who is authorized to make contributions to the IR, (3) defining collections, (4) restricting access to IR content, (5) identifying metadata formats and authorized metadata creators, and (6) determining what is acceptable content.

Content and Structure Issues

When the faculty websites were first customized and assigned to them, the technical support team helped all faculty members in digitizing their documents, i.e. converting them to PDF files. A User's manual was available in each faculty website**.** Authors (faculty members) are in charge of digitizing and uploading their publications and documents to their website. The KSUR has a total of 48789 file URL's. The proportion of the faculty's full text publications uploaded is very small. Only 15% of my publications and documents are stored in the repository. Faculty publications are stored in folders and subfolders, which are given serial numbers, not fields and subfields. Folders and subfolders are not classified according to departments, disciplines, document type, document

language, or fields. Folders and subfolders contain a random collection of articles belonging to different faculty in the different disciplines. A ingle faculty member's publications are scattered in the diferent folders and subfolders and he/she would not know in which folders and/or subfolders their documents are stored. Repository content has no metadata associated with their digital material. Faculty are not required to include any keywords when uploading their documents (See Figures 1 & 2).

Figure 1 Sample Folders and Article Groups in the KSUR

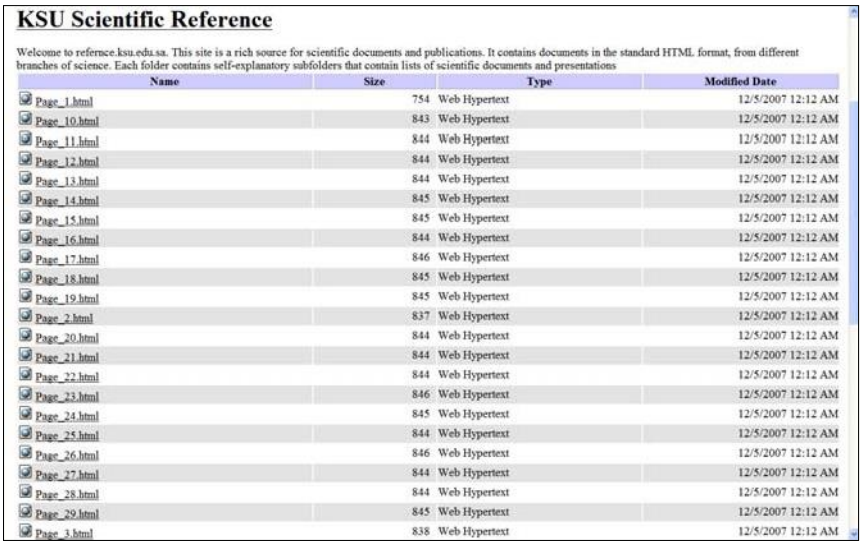


KSU Scientific Reference

Welcome to refernce.ksu.edu.sa. This site is a rich source for scientific documents and publications. It contains documents in the standard HTML format, from different branches of science. Each folder contains self-explanatory subfolders that contain lists of scientific documents and presentations

Name	Size	Type	Modified Date
Articles070898 Click on the link above to access the document, scientific documents, and presentations related to Articles070898		Folder	
Articles070899 Click on the link above to access the document, scientific documents, and presentations related to Articles070899		Folder	
Articles070902 Click on the link above to access the document, scientific documents, and presentations related to Articles070902		Folder	
Articles070903 Click on the link above to access the document, scientific documents, and presentations related to Articles070903		Folder	
Articles070904 Click on the link above to access the document, scientific documents, and presentations related to Articles070904		Folder	
Articles070905 Click on the link above to access the document, scientific documents, and presentations related to Articles070905		Folder	
Articles070908 Click on the link above to access the document, scientific documents, and presentations related to Articles070908		Folder	
Articles070909 Click on the link above to access the document, scientific documents, and presentations related to Articles070909		Folder	
Articles070910 Click on the link above to access the document, scientific documents, and presentations related to Articles070910		Folder	
Articles070911 Click on the link above to access the document, scientific documents, and presentations related to Articles070911		Folder	
Articles070912			

Figure 2 Examples of File Types in the KSUR



KSU Scientific Reference

Welcome to refernce.ksu.edu.sa. This site is a rich source for scientific documents and publications. It contains documents in the standard HTML format, from different branches of science. Each folder contains self-explanatory subfolders that contain lists of scientific documents and presentations

Name	Size	Type	Modified Date
Page_1.html	754	Web Hypertext	12/5/2007 12:12 AM
Page_10.html	843	Web Hypertext	12/5/2007 12:12 AM
Page_11.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_12.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_13.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_14.html	845	Web Hypertext	12/5/2007 12:12 AM
Page_15.html	845	Web Hypertext	12/5/2007 12:12 AM
Page_16.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_17.html	846	Web Hypertext	12/5/2007 12:12 AM
Page_18.html	845	Web Hypertext	12/5/2007 12:12 AM
Page_19.html	845	Web Hypertext	12/5/2007 12:12 AM
Page_2.html	837	Web Hypertext	12/5/2007 12:12 AM
Page_20.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_21.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_22.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_23.html	846	Web Hypertext	12/5/2007 12:12 AM
Page_24.html	845	Web Hypertext	12/5/2007 12:12 AM
Page_25.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_26.html	846	Web Hypertext	12/5/2007 12:12 AM
Page_27.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_28.html	844	Web Hypertext	12/5/2007 12:12 AM
Page_29.html	845	Web Hypertext	12/5/2007 12:12 AM
Page_3.html	838	Web Hypertext	12/5/2007 12:12 AM

The Arabic document content is unreadable (appears in gibberish). Abstracts are shortened to few lines. 70% of the abstract is simply deleted. When articles uploaded by the faculty in PDF format are located in Google or Google Scholar, they appear in WORD not PDF format (See Figures 3 & 4).

Figure 3 Example of Output File Format with an Unreadable English Text with Jumbled Print

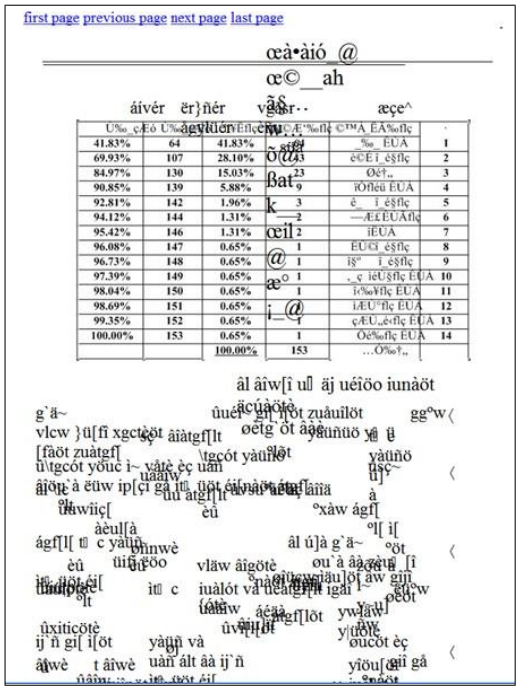


Figure 4 Example of Output File Format with an Unreadable Arabic Text

There is low awareness among faculty, students and the public in Saudi Arabia in general of the availability of external copyright-cleared collections. Respondents tended to rely on search engines such as Google for tracking down external digital images and multimedia materials, but reported information overload when they do so. Access to faculty publications is not protected by copyright law and plagiarism is practiced by some researchers and graduate students in Saudi Arabia. Anybody can access faculty publications. They are not password-protected.

Access and Searching Issues

Documents in the KSUR cannot be accessed through the university library website, i.e. OPACS, electronic databases or any other kinds of electronic document centers. No special link is available with a main page, simple and advanced searching tools and multiple keyword narrowing options. Faculty publications can be only accessed through Google or Google Scholar when an author's name is entered in the search box.

Since documents are stored in folders and subfolders, and are just given serial numbers, it is a waste of time to search those folders and subfolders one by one. The only way to access documents stored in the repository is to search Google, Google Scholar, or Microsoft Scholar by author. Options for limiting the search by language, publication date, document status, document type, document language, or discipline are not available.

Technical Support Issues

A team of 10 support staff provided training and helped faculty solve document digitization and uploading problems. Help is offered by phone or e-mail.

Recommendations

Based on the results and recommendations of Institutional Repository studies by Bruce (2005), MIDESS Project (2005), Hayes (2005), Shepherd (2007), Markey, Rieh, St. Jean, Kim, Yakel (2007), a number of guidelines are given below to help improve the publicity, administration, content (input and output, copy right isues), access and searching options, technical support, functionality of the KSU Scientific Repositories. The KSUR technical and functional requirements, KSUR structure, accessing the KSUR, KSUR searching tools and narrowing option, KSUR copyright laws, KSUR funding, KSUR help screens and guides, KSUR technical support.

Publicizing KSUR

The benefits of the KSU digital Repository should be promoted to the individual faculty, department and college. These include the long term preservation of the material, the ability to easily locate the material and the expected prestige for the individual faculty/department gained by sharing the material. The KSU digital Repository should be publicized and actively promoted throughout the KSU campus (colleges and departments) through presentations, workshops, tutorials, user groups, personal contacts, campus newsletters and students' paper… etc.

KSUR Administrative Requirements

Creation, operation and maintenance of the KSU digital Repository should be supported by the highest level within KSU. The Main Library staff should be in charge of managing the KSUR not the KSU Portal Department. A special Repository Unit may be

established. The KSUR Unit should develop a records storage **plan**. It should establish policies for creating, approving, and enforcing records, including a classification system and a records retention policy. Policies should define the following: (i) acceptable file formats, (ii) determining who is authorized to make contributions to the IR, (iii) defining collections, (iv) restricting access to IR content, (v) identifying metadata formats and authorized metadata creators, and (vi) determining acceptable content. Documents should be classified and stored according to standard operating procedures. The university must coordinate access and circulation of records within and outside the university. Faculty should have access to the KSUR and should be able to search it through the university portal and/or library website.

There should be **funding** for adequate hardware to ensure that the necessary storage space for the digital material is available. Additional funding may be required for more centralized storage. Funding almost always comes from the library.

Technical Requirements of KSUR

The KSUR should have flexible and powerful search facilities. The KSUR needs to be capable of handling a variety of file formats, including still images, sound and video. The input and output formats that the KSU digital Repository supports should be identified to ensure that digital material can be exported and imported into other digital repository systems to ensure portability of data. They must be able to interoperate with other administrative systems, portals, other repositories, and they must not lock their content into systems from which it is difficult and expensive to extract. The KSU Digital Repository should interface to other systems, including the VLE, Portal Library System, Intranet etc. KSU must coordinate access and circulate records within and outside the university. The KSUR should connect to, and be accessible from, other systems within KSU such as the KSU Library system, the Virtual Learning Environment (VLE) and university portals. The KSUR infrastructure needs to be flexible enough to enable the creation and management of a variety of metadata schemas to meet different needs across the subject disciplines. Bulk upload facilities for images and other content should be provided. The most appropriate metadata schemas for the digital material should be identified and these should be discussed with the faculty depositing the digital material. Agreement should be also made as to who enters the appropriate metadata for each digital object. The KSU Repositories should be primarily designed to hold collections of static objects, in addition to metadata information relating to those objects.

It is important to define the scope of the KSUR, determining what will be included in it and what will not, this would allow the KSUR administrator to make an estimate on the amount of data, its likely growth and costs. Once the digital objects have been added to the Repository, the following questions should be addressed: (1) Who owns the collection of digital material added to the KSUR? (2) Who has the rights to add, modify and delete material from the KSUR collection (the administrator, the depositor or others?); (3) who is responsible for entering the metadata corresponding to the digital object (the depositor, a Library staff or specialized personnel?); (4) Who has a detailed understanding of the digital subject matter being deposited? (5) who is the owner of the deposited collection? (6) depositors wish their material to be used in the digital repository?

The KSUR Structure

A Repository is a database. Users of a Repository datbase need a quick and efficient means of finding published materials in the database, such as articles on a given topic. Most electronic databases have similar features and functions. Thus the Repository consists of records which are whole units of information. There are usually thousands of records in a database. Records are divided into smaller units of information called fields. A record and

each bit of information is a field. Typical Repository fields include author, title of the article, journal title, publication date, subject headings, and abstracts all of which are searchable. Each record in Repository must represent one thing, include the citation, and include an abstract or even full text.

Accessing KSUR

By networking a database a number of users can search the same database simultaneously. The database should be available at workstations in the Main Library and Departmental and College Libraries. It should be available to KSU faculty and staff who can access the KSU's home page from their office PC, or from home if they have dial-in access to the KSU. KSU students who have joined the Electronic Campus service may also access it from home and from some computer labs. The Databases page must direct users to the relevant electronic resources for the various subject disciplines. General information is provided on each database, as well as help screens for searching techniques.

Boolean operators AND, OR, and NOT, Keyword searching, Controlled Vocabulary and Field Specific Searching (title, author, subject, journal or source, publication year, dates covered, source, identifiers, ISBN, ISSN, institution, sponsoring agency, descriptors, type of publication included, language, abstract, publication format) should be added to the KSUR. A field-specific search is used when users are looking for: (i) articles in a particular journal, (ii) items published in a particular year or years, and (iii) publications written by a particular person). Types of search (Basic and Advanced search) and how results are displayed must be also taken into consideration.

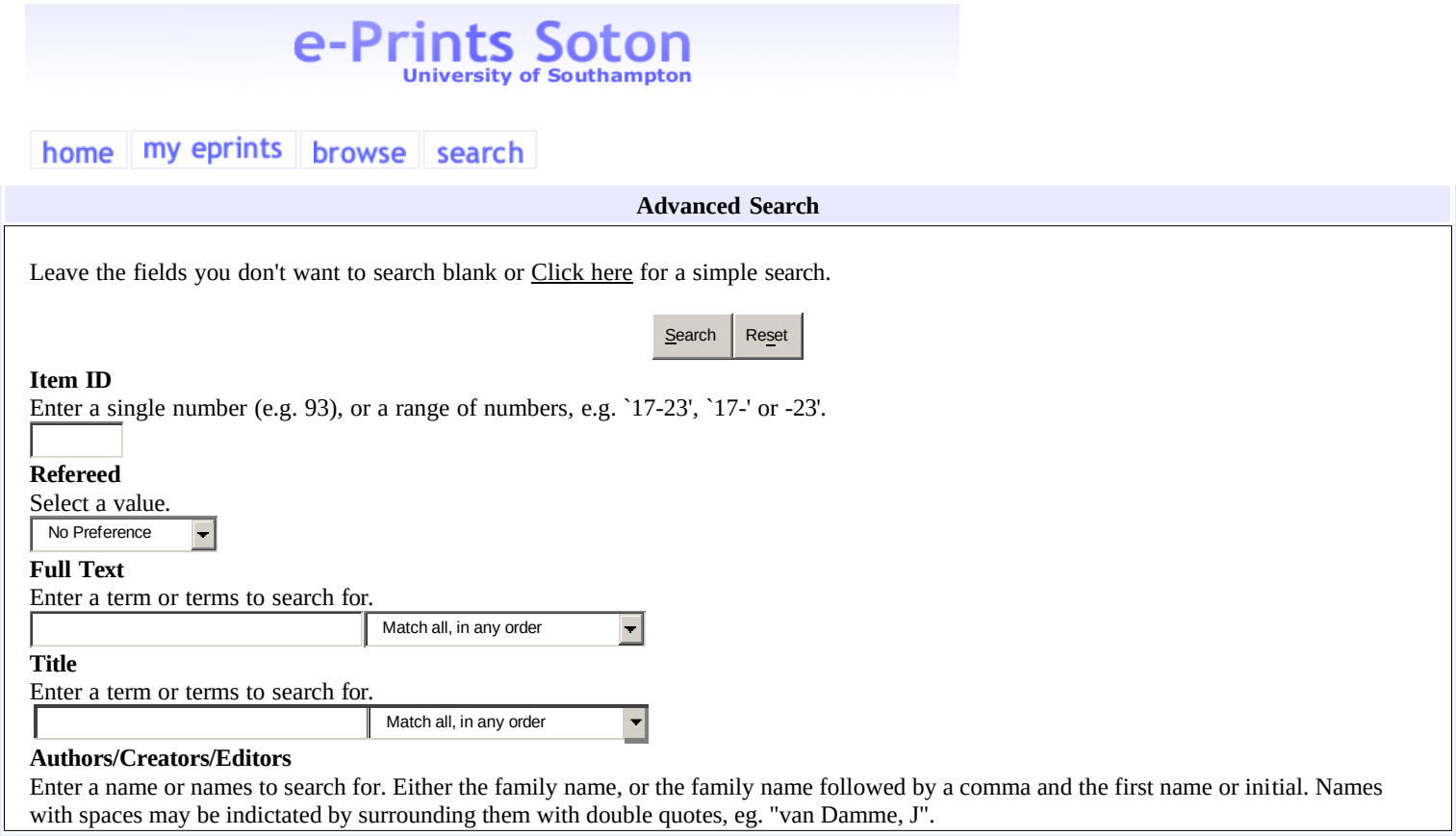
The user should be able to search the repository by author; publication title; subject area (science, math, engineering, medicine, history, geography, education…etc); item type (any publication, journal article, book, book review, book section, monograph, proceedings, serials, computer program, dissertation/thesis, creative works, guides, patents, artifact, non- print media, image, audio, video, dataset, bibliographies, catalogs/directories, reference materials, reports, tests, questionnaires, translations, teaching resource, historical materials, other); publication date; college/department; editors; status (published, in press, submitted, unpublished); type of results (full text, abstract or citation), order of results (by year most recent first); ability to print, save or e-mail results; ability to go back to previous search screens or to the main page (See Figure 5 for a sample of repository fields and searching options).

Users can access he document citation and abstrcts, but access to full-text articles may be a Repository password.

KSUR Copyright Laws

Before submitting digital material to a KSU digital repository, the potential depositor of digital material and the administrator of the digital repository need to be clear that the material submitted does not breach Copyright and both need to be clear what the potential use of the material will be once it has been deposited in the KSU digital repository. Copyright must be made clear. Some material needed to be closely restricted for data protection reasons such as medical and space images. Some content can be password-protected.

Figure 4 Examples of Advanced Search and Narrowing Options from ePrints Soton Repository Software



Match all, in any order

Authors/Creators

Enter a name or names to search for. Either the family name, or the family name followed by a comma and the first name or initial. Names with spaces may be indicated by surrounding them with double quotes, eg. "van Damme, J".

Match all, in any order

Editors

Enter a name or names to search for. Either the family name, or the family name followed by a comma and the first name or initial. Names with spaces may be indicated by surrounding them with double quotes, eg. "van Damme, J".

Match all, in any order

Date

Enter a date or date range.

Examples: "**1985-**", "**2001-05-17-2002-05-16**", "**-11-1980**"

Abstract

Enter a term or terms to search for.

Match all, in any order

Uncontrolled Keywords

Enter a term or terms to search for.

Match all, in any order

Journal/Publication Title/Series Name

Enter a term or terms to search for.

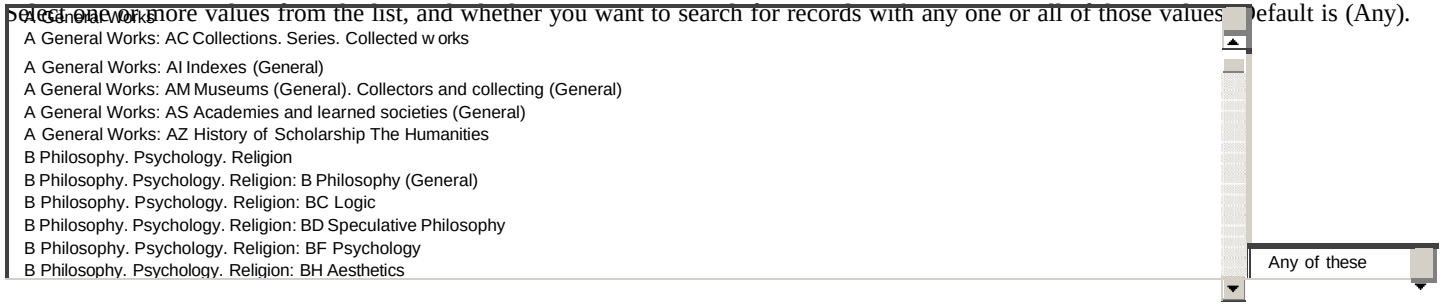
Match all, in any order

School or Centre

Select one or more values from the list, and whether you want to search for records with any one or all of those values. Default is (Any).

Subjects

Select one or more values from the list, and whether you want to search for records with any one or all of those values. Default is (Any).



Item Type

Select one or more values from the list. Default is (Any).

Article
Book
Book Section
Conference or Workshop Item
Monograph
Patent
Thesis
Artefact
Show /Exhibition
Composition
Performance
Other

Status

Select one or more values from the list, and whether you want to search for records with any one or all of those values. Default is (Any).

Published
In Press
Submitted
Unpublished

Retrieved records must fulfill all of these conditions.

Order the results: by author's name

Search Reset

Related Sites: University of Southampton, Library, TARDis Project, GNU EPrints Software

KSUR Help Screens and Guides

Most databases have help screens that provide you with important information about searching the database and about what type of information is included in the database. The KSUR should have HELP information by: (i) Having a "Help" llink in the main page; (ii) Typing the word help; (iii) Pushing the F1 key or (iv)Typing a question mark.

KSUR Technical Support

Technical support must be available at more advanced levels. It is required for the sharing and use of digital material. Tools that support ease of use for depositors of different backgrounds can be provided. A refining software –offering assisted deposit and fast track, setting up to encourage good citation metadata for future use. Exemplars can be created for faculty to follow.

Conclusions

The KSU Scientific Repository is just a by-product of the Sharepoint software. No intentional efforts, policies, plans are available for creating a Repository on the part of KSU. The current KSUR lacks many features and requirements, is inaccessible from the KSU or KSU library websites, it is only accessible through search engines such as Google and Google Scholar. Since KSUR is a means of displaying the university's digital assets, Department Repositories, Subject Repositories (repositories containing digital material specific to a subject such as biology, medicine, agriculture, IT, business, education), Teaching and Learning Repositories where teaching material such as computer-based learning courses can be located, Research Repositories which contain both papers and thesis. To be successful, a team of specialists in library and information science must be in charge of the KSU Scientific Repository. IR's must be first pilot-tested and user needs assessed.

References

1. Bruce, Rachel. *Institutional Repositories – the State of the Art*. (Joint Information Systems Committee (JISC), 2005). http://www.subscription-agents.org/conference/200502/Bruce.pps
2. Brown, Mark, Hey, Jessie, Lucas, Natasha, Simpson, Pauline. *Building an Institutional Research Repository Based on User Requirements –a University of Southampton Case Study*. (IR Workshop, 2004). eprints@soton.ac.uk
3. Foster, Nancy Fried.; Gibbons, Susan. *Understanding Faculty to Improve Content Recruitment for Institutional Repositories.* (D-Lib Magazine, 11, 1 Jan. ERIC Document Reproduction Service No. ED490029, 2005).
4. Hayes, Helen. *Digital Repositories: Helping universities and colleges.* (Briefing paper, 2005). http://www.jisc.ac.uk/publications.
5. Joint Information Systems Committee (JISC). *Digital Repositories: Helping universities and colleges.* Briefing Paper – (Further Education Sector, 2005). www.jisc.ac.uk/media/documents/programmes/digitalrepositories/repositoriesbp2005further.pdf
6. Joint Information Systems Committee (JISC). *MIDESS Project User Requirements Analysis Executive Summary* (2005).
7. http://ludos.leeds.ac.uk/midess/MIDESS%20workpackage%203%20User%20Requirements%20Specification.pdf
8. Markey, Karen; Rieh, Soo Young; St. Jean, Beth; Kim, Jihyun; Yakel, Elizabeth. *Census of Institutional Repositories in the United States: MIRACLE Project Research Findings.* (ERIC Document Reproduction Service No. ED495463, 2007). http://www.clir.org/pubs/reports/pub140/contents.html
9. Shepherd, Larraine. *LCoNZ Institutional Research Repositories Project* (2007).
10. www.caudit.edu.au/educauseaustralasia07/authors_papers/Shepherd-219.pdf.
11. Treloar , Andrew. *Building an Institutional Research Repository from the Ground Up: The ARROW Experience*. (The 10th Australian World Wide Web Conference. Seaworld Nara Resort, Gold Coast, July 3-7, 2004). http://ausweb.scu.edu.au/aw04/papers/refereed/treloar/paper.html