INTEGRATED KNOWLEDGE DATABASE FOR ACADEMIC RESEARCHERS AT THE UNIVERSITIES: INSTITUTIONAL PROJECT

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ABSTRACT: *Information inflation and diversity of use lead to the emergence and spread of different species databases, as bibliographic, or full-text, the widespread of the Internet contributed to advances in communication and information exchange to offer this kind of technology, this information processing and utilization requires automated documentation.*
The cognitive data for academic research at Universities base the first integrated model, to create for scientific and research production to affiliates of academic members, the overall idea for this institutional project, which includes the nine main sections including one knowledge, academic database [8], to access and search through an integrated search browser works in various three levels of research (simple search - advanced search - specialist search), the purpose of the database to commitment for the scientific bases and technical standards for construction and design academic database[14] within an electronic environment, to ensure that saving and retrieving information with high quality, to work on the development of the database in accordance with global standards that meet the highest quality control in university educational institutions.

Keywords: Academic databases; Knowledge databases; university databases; integrated library systems; Machine readable cataloging.

INTRODUCTION

The construction of knowledge database of academic members [10] try to cover all requirements and publications for scientific abstracts databases-full text researches- books - multimedia forms - resumes - patents - scientific instruments and equipment, theses, scientific articles) to the expansion and integration of all these forms to incorporate in an integrated and comprehensive academic database [15].

The structure of the academic database [20] develops the types of potential researches during the construction of scientific abstracts according to the standards and curricula and methods of scientific research, to provide excellent data for researchers and specialists in the universities.

The database improves the objectivity treatment through the expansion of the use and application of keywords instead of subject headings, to pave and preparation for the construction of the specialized scientific academic thesauruses.

Database system introduces for each part of the nine main sections, with the possibility of languages sorting, location, and the time period, content, nature, information source form, publishes data, place of publication, publication date, abstracts, serials, key word search, subject search, linking research data in the scientific deanships and departments within the university.

The academic database [20] at the university is keen on the application and development the global standard's bibliographic descriptions which approved by the Library of Congress in April 2013, which replaced by the standard rules of bibliographic description AACR2 that have been working out since 1978, it was current replaced by Resources Description and Access rules since 2013, is keen to apply the personal attributes elements, consisting of eleven elements to legalize the standard biographies. Databases are a collection of data and information stored in order to certain format for archiving, retrieval and extraction results, defined as a simplified set of rank data and organization associated with each logical linking.

Databases can be divided into four types according to the nature of the content as follows:

- Bibliographical Databases

This kind of databases provides the metadata [6] regarding the information resources the most famous online databases (MEDLINE) in Medicine, (AGRICOLA) in Agriculture, and (ERIC) in Education, which operate for analysis, indexing and retrieval the intellectual production in their respective areas of specialization, these rules include descriptive and bibliographic references to thousands of periodicals and specialized published sources with different regions of the world.

- Reference Databases

These kinds of databases Provide reference answers to the researchers such as electronic dictionaries, glossaries, directory databases, and electronic encyclopedias.

- Numeric & Statistical Databases

To provide statistical information on population, include a variety of different elements of life.

- Full-Text Databases

To provide full text results with bibliographic information sources.

Project objectives

The presented project aims to create a unique electronic information system for the University, to achieve the leadership of other universities with comprehensive and integrated accordance with the international standard rules for the establishment of knowledge databases.

in order to publish the scientific research resources at colleges and deanships for the academic staff members, under integrated electronic system [15] through comprehensive knowledge database [10], to achieve researchers to easily access for the metadata and information [6], with investigative features and scientific arbitration to match international quality standards to create a comprehensive knowledge databases, this system allows for all educational institutions to free access to join and participate the scientific publications for all participants.

Many of the scientific members (Researchers − Academic members- decision makers - students) will benefit of the scientific component of the knowledge database [10].

Emerges through this overall objective of the project, more summarized sub-objectives as follows:

- To provide a smart environment based on the latest information and communication technologies to integrate the scientific publications for the academic members of the University with the international scientific community and their participation in specialized knowledge society.

- To build science and technology and creativity indicators to support decision-makers to the preparation and implementation of research and development the university plans.

- To create main indicators to support the general scientific research policy at the university linked to the local community.

- To keep the scientific research publications of the University academic members as a basis for building creative capabilities in the element of scientific research.

- To provide information for the academic members at the University, through their statements and their biographies.

- Enable scientific researchers to access, benefit of scientific research data and all other sorts of the university resources, with the possibility of providing scientific publications with other universities.

- Availability, marketing the database for all beneficiary communities and contribute to the funding of research projects with the community participation.

- The integration with similar academic knowledge database systems, locally, regionally and internationally.

1- Constituent elements of the database design

Figure no. 1 for database elements

- Create and design the official website of the academic database through the university homepage [14, 20].

- Supply the appropriate automated integrated system as: (SIERRA- SYMPHONY [7] -HORIZON- VTLS, etc.) to manage all necessary operations, using the international rules (Machine Readable Cataloging -MARC) [3, 11] to facilitate the subsequent export and import data with other databases that using the MARC record [19].

Figure no. 2 for MARC record elements

- The adoption of international description rules RDA [1] "Resources Description and Access", which has been certified by the Library of Congress that starting from April 2013 as the basis for data processing to apply the following requirements:

1- Introducing amendments to the RDA rules [5] and availability of source description, which includes title elements and statement of responsibility 245, publishing data elements260, physical description elements 300 [13].

2- Developing the authority files [9, 12] (1XX-6XX-7XX) to activate the crossing system.

Figure no. 3 for authority record

3- Applying fixed-length data elements 008

Figure no. 4 for fixed-length data elements

4- Activate 7XX linking elements

Fields with things to note

○ 7XX linking fields
  ● Serials use is unchanged
  ● Now available
    ○ 775: Other edition (i.e., other expression)
    ○ 776: Additional physical form entry (i.e., other manifestation)
  ● Can be used to express FRBR relationships, especially the content relationships, such as adaptation of, contains (expression), reprint of, revision of, etc.
    ○ Use the $i subfield

Figure no. 5 for linking elements

5- Activate 856 substantive processors activate elements

The substantive processing (descriptors – keywords) in the element 653

- Selection of subject processing according to the accredited list of topics, such as Library of Congress Subject Headings LCSH, as well as the legalization of the keywords and scientific content of information resources within the database.

5- Prepare a constituent certified paper to identify intellectual property and belonging templates to the database.

Research design

- The first step in the design process is to implement the hardware and software environment as required; a separate environment from the production environment is established for development and testing by the technical team. Another environment is also established for the functional users for their testing once the technical team releases the changes for functional testing. System design documents and specifications are developed based on the requirements agreed to by the technical and functional users. [14]

- Coding: Each process is developed according to the specifications received by the technical team; this involves

designing, coding programs, subprograms, creating tables and data elements. Based on the process the test scenarios will be developed by the technical team for the testing unit. The output of each process will be checked thoroughly before releasing it to the functional users for testing.

Database Technical Operations

Include all necessary technical procedures for the machine readable cataloging [16] using the integrated library system [7,11,18] to enhance the database research systems, to create MARC elements [3], apply RDA rules [5], create authority files, linking elements, keywords, hyperlinks, Fixed length data element, person attributes new elements.

- The database home page

To create the database portal (Home page) on the Internet include the different types of refine results for search, the various links for active icons for the database official site.
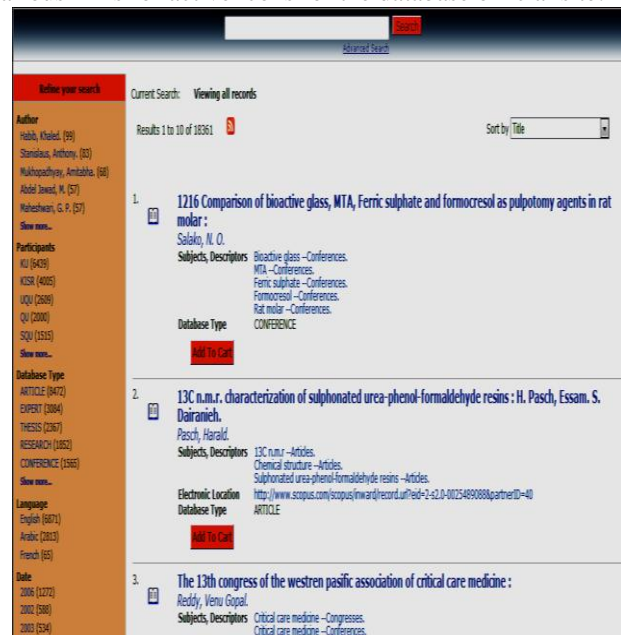

Figure no. 6 for refine research results

Research Methodology

- Through the provided study, the team will use an application development methodology for the establishment and operation of the academic database of the university.

- The main objective of enterprise applications is to design, develop, and maintain quality software, the following steps are required:

- Analysis: an analyst investigates the requirements in detail and schedules a meeting with the crew to learn what data is kept, how it is processed, what information is produced, and how that information is used.

Action Plan

Action Plan includes the general framework for the academic database structure [20] to nine major sections according to the following component:

* Thesis section: theses and dissertations, which includes approved scientifically recognized (Master-Doctorate) from academic universities by the Ministry of Higher Education.

* Articles, Researched section: The reviewed scientific and published articles for academics in scientific accredited and approved journals by the university.
* Accredited books section: Published books (the reviewed and approved or the published by the university with the consent of the university council of scientific publications).
* Biographies section: include the academic member's metadata.
* Multimedia section: include (lectures, meetings, conferences, workshops and educational support films).
* Equipment section: scientific instruments and equipment's file includes specifications of scientific instruments and laboratory which used in research within the university academic members.
* Patents section: patent's file includes the scientific specifications and extract of all registered patents for the affiliated academics to the university.
* Meeting papers (Conferences, workshops, forums, symposiums) section: the scientific papers and conference proceedings that the academies attended or participated.
* Technical reports section: include the various types of technical reports and related papers.

Developing and enhancement the various sorts of database search system
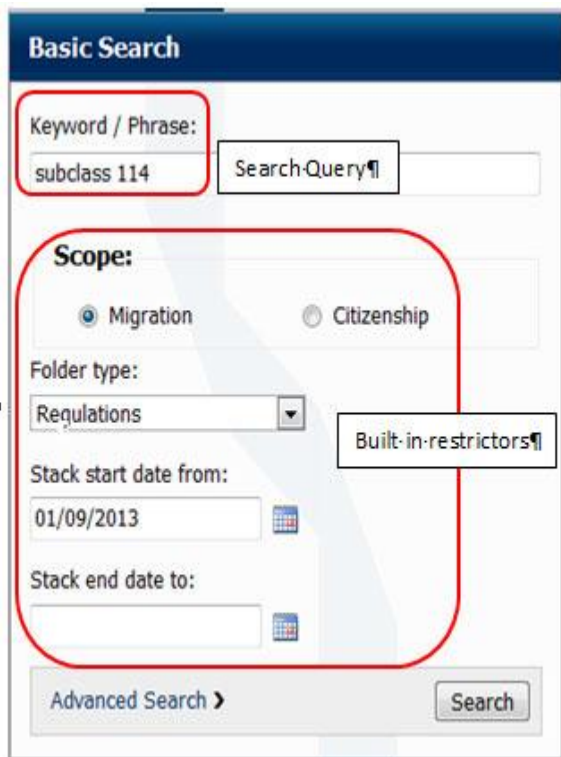**Basic search [17]**

Figure no. 7 for basic search

Developmental stages of basic search in the knowledge database include all the available elements as follows: [2]
1- Titles: (Abbreviated Title, Key Title, Uniform Title, Translation of Title by Cataloging Agency, Collective Uniform Title, Title Statement, Varying Form of Title, Series Statement/Added Entry-Title, Series Statement, Formatted Contents Note, Summary, etc., Series Added

Entry - Personal Name, Series Added Entry - Corporate Name, Series Added Entry - Meeting Name, Series Added Entry - Uniform Title).
2- Authors: (Personal Names-General Information, Corporate Names-General Information, Meeting Names-General Information, Statement of responsibility, etc., Statement of responsibility, etc., Fuller form of personal name, Statement of responsibility, etc., Formatted Contents Note, Summary, etc.).
3- Keywords, Descriptors and subject Headings: (Subject Added Entry - Personal Name, Subject Added Entry - Corporate Name, Subject Added Entry - Meeting Name, Subject Added Entry - Uniform Title, Subject Added Entry - Chronological Term, Subject Added Entry - Topical Term, Subject Added Entry - Geographic Name, - Uncontrolled, Subject Added Entry - Faceted Topical Terms, Index Term - Genre/Form, Index Term – Occupation, Index Term – Function, Index Term - Curriculum Objective, Subject Added Entry - Hierarchical Place Name, Local Subject Access Elements 505 Formatted Contents Note, Summary, etc.).

Advanced research

Figure no. 8 for advanced search

Developmental stages of advanced search in the knowledge database to include all the available elements as follows:
1- Alphabetical Title: (Abbreviated Title, Key Title, Uniform Title, Translation of Title by Cataloging Agency, Collective Uniform Title, Title Statement, Varying Form of Title, Series Statement/Added Entry-Title, Series Statement, Uniform Title, Added Title, Series Added Entry - Personal Name, Series Added Entry - Corporate Name, Series Added Entry - Meeting Name, Series Added Entry - Uniform Title).
2- Alphabetical author lists: (Personal Names-General Information, Corporate Names-General Information, Meeting Names-General Information.
3- Subject, Keywords lists: (All subject headings, keywords, descriptors, local Subject Headings, Subject Added Entry - Personal Name, Subject Added Entry - Corporate Name, Subject Added Entry - Meeting Name, Subject Added Entry - Uniform Title, Subject Added Entry - Chronological Term, Subject Added Entry - Topical Term, Subject Added Entry - Geographic Name, Index Term – Uncontrolled, Subject Added Entry - Faceted Topical

Terms, Index Term - Genre/Form, Index Term – Occupation, Index Term – Function, Index Term - Curriculum Objective, Subject Added Entry - Hierarchical Place Name, Local Subject Access Elements).
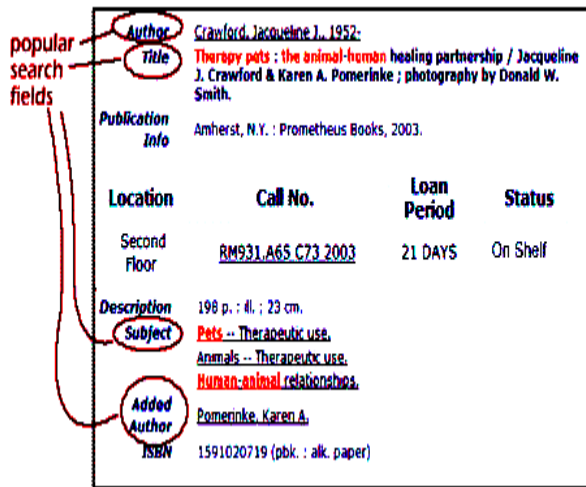
Specialized research

Figure no. 8 for specialized search

Development stages of specialized search in the knowledge database to include all the available elements as follows: (Titles – Authors –Subject headings) through an additional specialized list of these entries, activation properties of the sorting and limitation, to include the following aspects: (Timing limitation, Item type, Item language, Place of item publication, Audience, Governmental publications, Conferences, meetings).

Supported languages for academic database

In this context, the academic database uses local language to cover the academic elements with the ability to deal with other foreign languages.

The technical processing of the descriptive cataloging [16] will be provided in English as a major language for all foreign information resources.

Research terminology

1- International Standard Book Number (ISBN) as a global standard number associated with each edition of information resources).

2- International Standard Serial Number (ISSN) as a global standard number associated with all sequential versions).

3- The main entries, intended to (Authors- Association-Meetings) responsible for the preparation of information resources.

4- Main and other titles (intended to all major titles translated and partial, uniform and consolidated titles that available in the information resources).

5- All cooperative responsibility Data (means all other persons or associations that participated in the publication of any degree of responsibility).

6- Edition Data (means all reported data in this edition and its number, and who has made any associated function with this particular edition).

7- Publication data (all concerning data on the place of publication, publisher, date of publication, place of manufacture, factory, date of manufacturing.

8- Descriptive data (means all data to determine the pages, papers, forms, illustrations, and the associated supplementary materials).

9- Serials (means all associated serial titles, numbers) [4].

10- Notes, Illustrations (mean all different sorts of notes, such as: Language note, Audience, Thesis, Abstract, Contents, etc.).

11- Subject coverage (includes subject headings, descriptors, and keywords).

12- Other entries (all responsibility data who participate the information resources).

13- Electronic Internet linkages to all information resources.

14- The hyperlinks to source information via the Internet.

15- Linking of bibliographic record elements (linking with Authors, Editions, Subject headings, Keywords, Descriptors, etc.).

RESULTS

1- The construction of knowledge database of academic research [10] at the university is a leap form of academic databases in the universities as a transition from bibliographic or specialized databases (scientific abstracts databases - full text database - multimedia forms - integrate CVs - patents - scientific instruments - theses - scientific articles) to the expansion and integration of all these forms and incorporated in a standard comprehensive academic database [8].

2- Database in the same frame for the internal development of the structure of the types of research the most of its potential and take advantage of the work during the construction of scientific abstracts according to the standards and curricula and methods of scientific research, and excellence that extracts of great importance for researchers and specialists.

3- Improve the objectivity treatment through the expansion of using and applying for keywords instead of drafting Subject Headings, this action will pave the preparation and construction of the specialized scientific university thesauruses.

4- The cognitive data for research academy for University base the first integrated model which includes the nine main sections within a knowledge academic database.[15]

5- Ability to access and search through one search browser that works in three levels of research (simple search - advanced search - specialist search).

6- Create a feature system, the main nine sections, with the possibility of sorting languages, location, time period, the nature of the content, form of information source, publisher's data, place of publication, key words search, subject headings search, linking search in the scientific deanships and departments within the university.

7- The database at the university which is keen on the application and development of global standards of the bibliographic descriptions which approved by the Library of Congress in April 2013, applying the personal attributes elements.

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