

Management of University Research Publication: A Case Study of JUIT Publication Database (JPubDB)

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ABSTRACT

Along with the teaching, publications and research output, national and international funding has become essential criterion for benchmarking and performance measurement of the university. To stand and compete with stakeholders, it is essential to carefully monitor the impact of university publication over global research. The role of the library becomes more important to take a lead in monitoring and management of the university publications. A library needs to gather, organize and maintain publication in a standard format and take appropriate measure to disseminate research with global community. Further, it is essential to assess the research impact of the publication through different methodologies such as bibliometrics or web metrics. The purpose of this paper is to develop a database of university publication with the acronym 'JPubDB' (JUIT Publication Database: available at <http://juit.ac.in/jpubdb>), in order to collect, analyse and organised at one place and market the research publication with global community. The provisions have been made to link each publication with each faculty profile and department in a standard citation style, assess the citation count through Google Scholar, sharing of publication through social networking tools, and if the full text of any publication is available, that can be downloadable in copyright free mode.

Keywords: University research publication, publication record management, bibliographic citation management, research promotion

1. INTRODUCTION

The reputation of academic institutions, primarily engaged in research, is recognised by the research output. The premier institutions in India like Indian Institute of Technologies (IITs) or National Institute of Technologies (NITs), have their publication information capriciously maintained. It is true that each faculty members must have their publication on their profile page, but sometimes, an external user looks for a comprehensive list of publications at a central place such as on home page or on department page. Many agencies seek a print copy of the faculty/department/university bibliography for the purpose of different statistics, ranking, benchmarking or funding¹. Various government bodies, as a part of their education reform, have made research activities more explicit for funding²⁻³. On this parameter, it is essential to have a central database of institutions publication which illustrates the, (i) Visibility of university research strength through publication; (ii) International standards and recognition by international bodies; and (iii) Benchmarking of university research output with other similar institutions.

So, there must be a provision of managing the university research output and share them with global community in order to improve the image, credibility

and status of university. It is also essential to market institutions research publications, sharing on social web (Altmetrics measurement—web-based metrics that takes account of the total influence of authors and their use of the web)⁴⁻⁶ and create a network of similar interest people through research networking. During recent years, a shifting trend has seen towards the popularising research work through social networking. The big database aggregators like SCOPUS⁷ is using Altmetrics to measure article level metrics to assess the research impact.

According to Wood², the success of the university depends upon the following: (i) their capacity to develop and implement appropriate research management plans; (2) being able to identify and encourage the high research performers on their staff; and, increasingly, (3) the ability of their staff to design projects to compete for funds earmarked for national priorities. The funding agencies also consider these aspects while funding for the different kind of projects. Along with this, the university also considers the performance appraisal of its staff based on the different parameters. These parameters include teaching loads, research loads, research collaborations, arrangement of funds, etc. The assessment of the staff, after all these activities, is based on the research output.

These research output may be in the form of research publications, articles, conference proceedings, book chapters, patents, case studies, reviews, etc, which highlights the academic and research capability of the staff. The research publication is one of the important factors considered for the career advancement, along with the other characteristics such as ability, energy, creativity, motivation, ambition and self-discipline. These characteristics have been used to distinguish between productive and unproductive researchers. However, research publications always been kept on top. For an example, University Grants Commission (UGC) in India has made a rule to accumulate minimum Academic Performance Indicator (API) score for appointment of teachers in university and colleges and Performance Based Appraisal System (PBAS) for further promotion. Along with the other teaching and research activities, the publication records do hold an important parameter in calculation of API and PBAS scores. Under these regulations, the applicant has to score a minimum score as decided by the competent authority for said posts (UGC 2010)⁸.

Keeping this purview as a prime consideration, this paper highlights the development of university publication database for effective management of publication, its dissemination, and to create publicity to global community. Furthermore, manually typing the list of publication on profile page of each faculty is a cumbersome task for the Webmasters. It is also a time-consuming task for preparing the statistics whenever needed. During this process there always a chance of errors in creating bibliography, standardising citation styles, etc. This paper discusses the methodology adopted by Learning Resource Center (LRC) of Jaypee University of Information Technology (JUIT) to develop a JUIT Publication Database- JPubDB.

Founded in 2002, the JUIT has been committed to exemplary teaching and research in different areas of engineering. The LRC is an integral part of JUIT, supporting the engineering education programs by providing teaching and research materials in the form of books, journals, databases and providing research support through value added services. Each year, LRC makes effort in collection of university publication information and analyse it for different kinds of statistics required by different agencies for the purpose of benchmarking and other statistical analysis. In view of continued demand, the LRC has made an effort to create a database so that the faculty publication remains continuously updated and can be used as and when required.

2. LITERATURE REVIEW

Maintaining a bibliography of institutional research is an old phenomenon but certainly not unique⁹⁻¹². Many efforts have taken to create bibliography and have taken the shape of institutional repositories¹³. Mansheima & Thompson¹⁴ conducted a survey on 128 libraries to determine how many have databases of faculty publications. They reported that out of 128 respondents; only thirty two have

faculty publications databases maintained with most of the commercial bibliographic software while two institutions maintain databases containing exclusively journal article citations. The analysis of the faculty research impact and the institutions research (monitored through maintaining the records of the publications) has been analysed by Ehrman Medical Library of the New York University Medical Center through use of Journal Citation Report (JCR)¹⁵. An attempt of developing web based faculty publication database at University of Connecticut Health Center, Lyman Maynard Stowe Library where MEDLINE, SciSearch, Current Contents, BIOSIS, HStar, Sport, TOXLINE, and Zoological Record Online databases were used to develop faculty publication database¹⁶. A similar initiative for developing web based publication database was reported by Riedling and Selberherr¹⁷ for the purpose of performance evaluation of Engineering and Information Technology faculty at University of Vienna. Volnyansky,¹⁸ *et al* developed a database which facilitates the automatic update of faculty publication based on PUBMED's PMID. This database has a limitation and fails to update the data when PMID is missing. Ho,¹⁹ *et al*. proposed a model 'PubWatcher' which track web publications from user specified website. Similarly, some of the library using reference managers for managing their institution publication²⁰.

Blummer²¹ discusses the faculty publication databases as an opportunity for libraries to provide services to users and proposed a Web-based faculty publication databases provision through library website. A Similar initiative was also taken at Illinois State University libraries for developing an online bibliography of scholarly works by campus faculty²². Some publication management initiatives specially focused on creating publication database for the purpose of creating standardized citation²³. Novak & Pardo²⁴ discusses the application of technology in assessing the evolving nature of faculty publication and role of library in managing them. They studied these aspects to understand the trends in legal scholarship and change in the publication patterns such as blogs and podcasts and the open access initiatives, active role of libraries to develop creative solutions to manage them in the form of bibliographies, searchable databases, and digital repositories to manage access, preserve, and disseminate faculty writings²⁵. Tabaei,²⁶ *et al* presented a case study on building an in-house faculty publications database of 'Touro College and University System Library' and assessed a positive impact on visibility of library.

Many literatures reported the utility of publication as a measure of faculty research strength and the record of publication is being used as a factor for promotion or credit of the faculty or department or university. The publications of the university in high impact journal are being used as a criterion of benchmarking and ranking among the institution²⁷. Doost³ argues on the dilemma on teaching and research results in publication and there must be criteria where it is important for faculty to bring

out publication in terms of their teaching and research in order to assess the impact. Some more literatures available, which highlight the faculty promotion, based on the publication²⁸⁻³¹. So keeping these paramount aspect as a focused area, the initiatives on collecting and managing faculty publication database can be witnessed through different methodologies. Connor³² described, Wiki Technology to create faculty publication database for promoting research productivity. Some others came up with the idea of Institutional repositories³³.

There are some reports, which illustrated the problem associated with the data collection and continued effort to build relationship between the library and teaching faculty to strengthen the publication database²⁴. Though, due to advancement in Internet technology and the legacy associated with copyright restrictions, the concept of maintaining bibliography remains alive. Schwartz & Stoffel²² has discusses the development of bibliography is easy and less costly than maintaining institutional repositories. Technology support such as Microsoft Access and Oracle, openURL linking services such as SFX, and digital management software such as CONTENTdm are quite helpful in management of bibliography³⁴⁻³⁶.

It is evident from the literature review that the creation and maintenance of publication database is far essential for assessing research impact, ranking, selection and promotion of faculty and benchmarking. The overall purposes of faculty publications bibliographies/databases fall into the categories of tracking research, communication, public relations, and statistics for accrediting bodies, etc. With these broader aims, the effort has been made to design and develop a database of ‘Jaypee University of Information Technology Publication Database’ with acronym “JPubDB” accessible at <http://juit.ac.in/jpubdb/>. The database is accessible from both library webpage as well a university home webpage.

3. METHODOLOGY

3.1 Planning

A custom computer programming methodology was adopted to develop the database “JPubDB”. A strategic plan was prepared in order to identify the most frequently asked information related to publication and its component. A relationship among each component was established. Based on the relationship between each component, the programming was carried out. Strategically, an ‘Author’ is one of key component in case of publication and it has been kept at center stage. An entity relationship diagram is shown in figure 1, illustrating the relationship of author with other entities. The bibliographic data for the database has been taken as four different kinds of document types (books, journals, conference publications and department of the university). Figure 1 shows the relationship of an author with different kinds of publication types. The author is also linked with the year, for showing the productivity by time. Based on these conceptual strategic planning, the programming was carried out to develop the database.

3.2 Database Design

The JPubDB was designed using PHP web programming language and database management system software ‘MySQL’. While creating the different types of tables in database, the different relationship amongst the entities was considered to link various components.

The author is related to various publications types (four in this case). These are Journal articles (author_jour), conference articles (author_conf), book (author_books) and book chapters (author_bookch). Each of these four document types further has their bibliographic description provided in the various tables (journal, conferences, books, and bookch). The author is further related to the

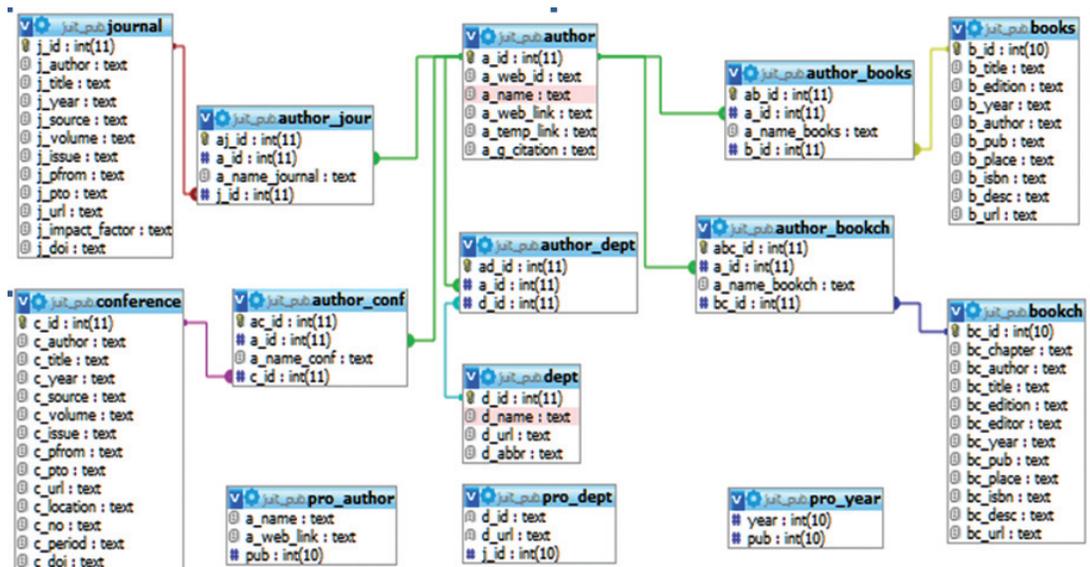


Figure 1. Entity relationship diagram showing various relationships in the JPubDB database.

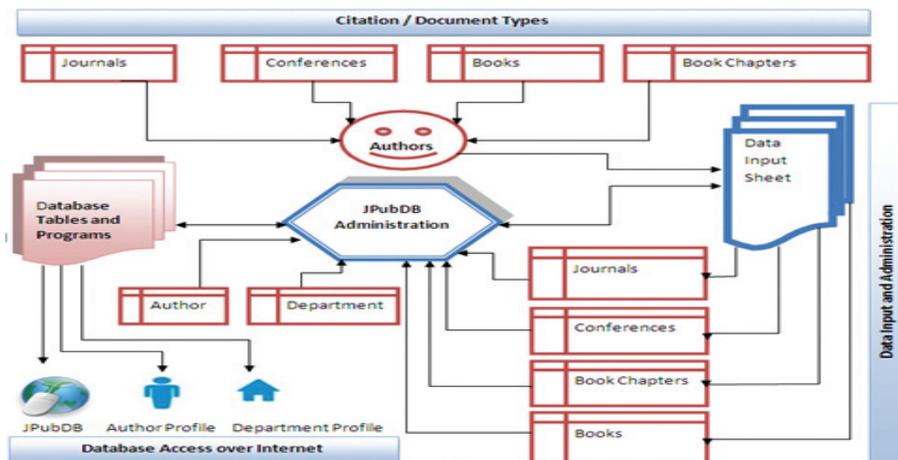


Figure 2. Workflow diagram of JPubDB.

department. Furthermore, there are three more essential component associated with the author and these are productive authors (pro_auth), which provide details on most productive authors; productive departments (pro_dept), which gives data about productive departments; and productive years (pro_year), which gives data on productive year. The productivity of author, department and year has been assessed as a measure of number of publications linked to these components. As author is responsible for publishing a paper; author must be related to a department and furthermore the paper must have been published in a particular year. Whenever a paper is added to an author profile, the respective component also get values along with the author, in turn giving the statistics for that component. The overall workflow of the each of these components and relationship with the author is depicted as a graphical layout (Fig. 2). An administrative panel is also designed to monitor data input (Fig. 3).

3.3 Data Collection

The bibliographic data for the database is taken as

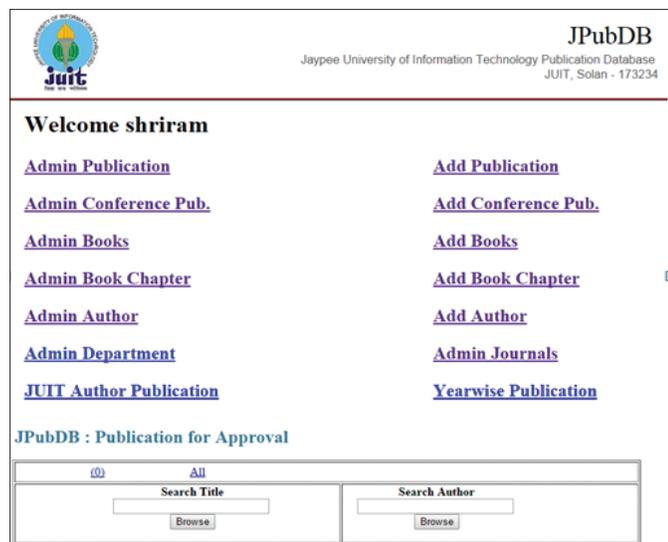


Figure 3. Administrative panel of JPubDB.

any publication falling under the four document types (journal, conference, book and book chapters) with affiliation of university. At initial stages, the data was collected from major bibliographic databases such as SCOPUS and Web of Science and annual reports of the university. The publications were manually sorted out having affiliation of JUIT. At later stage of the database development, a form for each document types is created for data input. Each faculty members were asked to input his or her publication information through the data input form from their respective web pages. An alert system is also created with Google Scholar as well SCOPUS, which track any new publication appearing in the name of university, which automatically alerts for new publication. To avoid duplicate entry, an algorithm was design to check the duplicate article (checked by title), if entered by any co-author of the paper. Once the data is entered, the bibliographic records are re-checked for any probable error, cross checking of impact factor, etc. through administrative panel (Fig. 3). The paper added by author appears at administrator page under ‘Publication for Approval’. To avoid author name ambiguity, only those articles are chosen, which have affiliation of JUIT. After all cross validation, the article is included into the database and linked with author profile to appear on respective profile page as well as department page. The Impact Factor for the journals is being taken from the Journal Citation Report of Web of Science.

4. DISCUSSIONS

4.1 Status of JUIT Publication

The university was established in 2002 and since its establishment; the faculties have published a total of 1985 research documents (till December 2015). These documents have been published in four major document types. These are abstract in conferences and seminars (2.82 %), Book Chapters (25, 1.26 %), Books (27; 1.36 %), Conference papers (826; 41.61 %) and Journal articles (1051; 52.95 %). As per the bibliographic information

retrieved from SCOPUS, 1024 (51.59 %) articles are indexed in it and accumulated a citation of 2937 citations. On the parameter of research output, the JUIT had been ranked 130rd in India and 2686 in World by SCIMAGO institutional ranking. (Table 1)

Table 1. Status of JUIT research publication (December 2015)

Document types	Total Publication	%age
Abstract	56	2.82
Book chapters	25	1.26
Books	27	1.36
Conference papers	826	41.61
Journal articles	1051	52.95
Grand Total	1985	100.00

4.2 Management of JUIT Publication

The database has two interfaces, one is meant for administrative activities, used by administrator (Fig. 3);

while other is user interface, used by the users (Fig. 4). The administrative interface facilitates the data entry, editing, and programming control, while user interfaces is used by user to see the various statistics. Each author and department has been provided with its own web interface. The author interface is directly linked with the profile page of the author available at respective department. On the profile page, the bibliographic citation is populated according to its publication year. Under each year, the list of the citation appears in an order of Book, Book Chapter, Journal and Conference Publications (Figure 5). On department page, the same information can be found displayed in similar order as it appears on author page.

4.3 Display Authors Contribution

Zyzanski,³⁷ *et al.*, argued on Academic achievement and promotion of faculty members based on the academic performance through research publication. The academic performance based on the publication output is one of

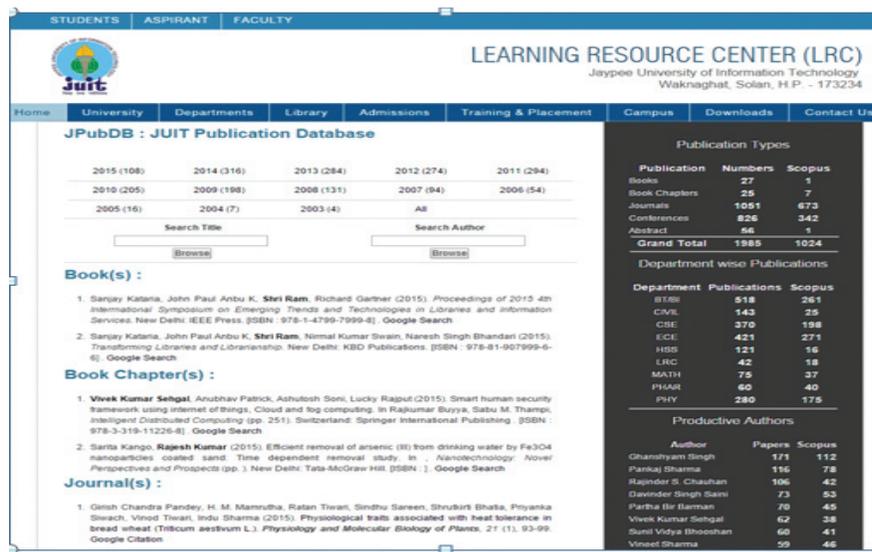


Figure 4. JUIT publication database home interface.



Figure 5. Author profile page.

the fundamental parameter to adjudge the performance. Author's academic and research performance has become more crucial in academic and research institutions. The database gives a facility to showcase the publication performance of individual faculty. Looking at the statistics, authority may be able to judge the performances of faculty (Figs 4 & 5). Many authors have given their viewpoint on research publication and the publication has always been a measure of tenure, promotion or annual pay revisions. Further, the publication output has become the key criteria for measuring the quality of university academic program as well as department.³⁸⁻³⁹

4.4 Display of Department Contribution

Beckett,⁴⁰ *et al.*, are of opinion that, while considering benchmarking and ranking of an institution, the publication performance of the institution or department is an essential parameter and play a crucial role for comparison with the other institution or department, other than infrastructure. The JPubDB provides a separate statistics for the department showing number of publication. The statistics available against each department on home page and can be navigated to respective department's webpage (Fig. 6). The statistics for department is populated based on the linking of authors with the department.

Department	Publications
BT/BI	403
ECE	351
CSE	272
PHY	248
CIVIL	123
HSS	82
IT	73
PHAR	62
MATH	58
LRC	34

Figure 6. Department statistics display.

4.5 Display of Document Types

The database has provision for display of total number of articles published as different document types, such as books, book chapters, conference publications and journal articles. To view detailed list of publication under each type, a provision for navigation has been provided which display the complete list of items under each document types (Table 1). It also provides the statistics of indexing of the article in SCOPUS which is considered as an important factor for quality assurance.^{41,42}

4.6 Display of High Impact Factor Journals

Authoring an article and publishing them in high ranked journals is an important factor at any academic and research focused institution. The visibility, benchmarking and ranking of the institutions always has criterion of the publication in high impact journals. SCOPUS SCI-

MAGO Institution Ranking is based on the university publication appeared in high impact journals. In order to assess the publication in high impact journals, a provision has been provided to enlist the journals in which faculty have published their research. The list provides the ranking based on the Impact Factor published by *Journal Citation Report*, ISI, Philadelphia. The navigation to each journal provides the complete bibliographic details of the article(s) published in that journal.

4.7 Linking and Providing Full Text Access

Rioux⁴³ of the opinion that, provision for making faculty publication linked over World Wide Web helps in reaching masses. Each article in the JPubDB is hyperlinked with the original source of publication for full text access where ever full text available. The linking has been done in three ways. Firstly, with a persistent URL of the article from publishers' website; Secondly, DoI (Digital Object Identifier); and Thirdly, through Google Scholar. Any article, if available as full text mode, can be accessed through navigation from JPubDB. If the full text of the article is not available, a link to abstract page of the publisher can help users to seek article from author/publisher. Further, if any book published by the faculty and is available in the library, it is linked with the library catalogue.

4.8 Search Facility

The database has been provided with search facility, which facilitates the searching of database by Title and Author (Fig. 4 – search box for title and author).

4.9 Connecting Professional Scholarly Networks

The priorities of the academic librarians should be to develop strategies for providing value added services to researchers well beyond online access to full text databases. While planning and giving value added services, it becomes essential to change the role of the special librarian⁴⁴. Building connection to professional and academic network strengthen the visibility. In this regard, the strategy for creating visibility through use of web tools such as ResearcherID and ORCID must be included as a value added services for researchers⁴⁵. A provision has been made to connect the faculty profile to the academic tools such as ResearcherID, ORCID, Google Scholar, and SCOPUS Author Profile (Fig. 5). This effort helps in assessing the indexing of the articles on these social networking tools. Further, it helps in building the networks with JUIT fraternity.

The JUIT Publication database provides a comprehensive platform for aggregated access to the university publication at single platform. The database is supported with most frequently needed statistics, most productive authors, department, journals, impact factor of journals and propagating research through social media. The success of the database depends on the universal acceptance of the initiatives of the libraries.

5. CONCLUSIONS

Creating a tangible product for collection and dissemination of information is an essential activity by the librarians. However, collecting, marketing and publicizing the faculty publication is an added responsibility of the librarians for ranking, benchmarking and whenever desired reporting authorities for decision making in terms of faculty selection and promotion. Analyzing the importance of faculty publication for ranking, benchmarking and other aspect related to it, it was decided to develop a robust system, which shall always remains a primary source for all kinds of statistics. A database with nomenclature 'JPubDB' was developed using a database management system and hosted on <http://juit.ac.in/jpubdb>. The database has more than one thousand nine hundred bibliographic records of publication. The details, especially statistics, are helpful in assessing the research progress of the university. It also helps in assessing the individual contribution as well as department contribution available in terms of number and types of publications in different years, most productive department, most productive authors and highly impact journals. Through this database, it is possible to access the full source of article, its access, and building research network with the university. Effort of creating the publication database proved feasible and informative but there are several logical extensions (tracing funding source, patents, author networks etc) could be established at later stage of the database development.

REFERENCES

1. Kumar, V. & Kundu, S.K.. Ranking the international business schools: Faculty publication as the measure. *Manag. Inf. Rev.*, 2005, **44**(2), 213-38
2. Wood, F. Factors influencing research performance of university academic staff. *Higher Education*, 1990, **19**, 81-100.
3. Doost, Roger K.. Faculty evaluation: an unresolved dilemma? *Managerial Auditing J.*, 1997, **12**(2), 98-104.
4. Altemetrics. (<http://hlwiki.slais.ubc.ca/index.php/Altmetrics>).
5. Altemetrics. (<http://altmetrics.org/>).
6. Galligan, F. & Dyas-Correia, S. Altmetrics: Rethinking the way we measure. *Serial Review*, 2003, **39**, 56-61.
7. Altmetric for Scopus. (<http://support.altmetric.com/knowledgebase/articles/83246-altmetric-for-scopus>).
8. University Grants Commission. Academic Performance Indicator Score, 2010, http://www.ugc.ac.in/pdfnews/8539300_English.pdf (accessed on 3.7.2015).
9. McKee, A. M., & Feng, C.C.H. Using computerized literature searches to produce faculty publications lists. *Bull. of the Med. Lib. Asso.*, 1999, **67**, 333-35.
10. Popovic, T. The college faculty bibliography. *Catholic Lib. World*, 1985, **56**, 338-39.
11. Potter, L.A. Creating a faculty publications database using Sci-Mate. *Medi. Ref. Serv. Quart.*, 1987, **6**, 43-62.
12. MacCorkle, L. Publishing an annual faculty bibliography at the University of Miami. *Inf. Tech. and Lib.*, 1991, **10**, 121-27.
13. Johnson, Richard. Institutional repositories: Partnering with faculty to enhance scholarly communication. *D-Lib Magazine*, **8**, 11
14. Mansheim, R.E. & Thompson, J.L. Faculty publications databases in academic health sciences libraries: A comprehensive survey. *Medical Ref. Serv. Quart.*, 1994, **13**(4), 21-34.
15. Vieira, D. & Faraino, R. Analyzing the research record of an institution's list of faculty publications. *Bull. of Medi. Lib. Asso.*, 1997, **85**(2), 154-57.
16. Bai, S. & Kelly, P. Development of a Web-based faculty publications database. *Bull. of Medi. Lib. Asso.*, 2004, **88**(2), 189-92.
17. Riedling, K. & Selberherr, S. A web-based publication database for performance evaluation and research documentation. 9th International Conference on Engineering Education, 2006, pp. R2F5-R2F10.
18. Volnyansky, Z.; Krol, M.; Roth, R.; & Reich, D.L. 2001. Automatic Update of the departmental faculty database using PUBMED's PMID. Proceedings of the Fourteenth IEEE Symposium on Computer-Based Medical Systems, p. 327.
19. Ho, L.V.; Hui, Siu Cheung & Fong, A.C.M. Monitoring scientific publications over www. *The electronic Library*, 2003, **21**(2), 110-16.
20. Kelly, J. & Marsalis, S. Building a RefWorks database of faculty publications as a liaison and collection development tool. *Issues in Scie. and Techol. Libra.*, Summer 2004.
21. Blummer, B.A. The availability of faculty publication databases from library web pages. *J. of Web Libr.*, 2007, **1**(2), 27-55.
22. Schwartz, V. & Stoffel, B. Building an online faculty publications database. *College & Undergraduate Lib.*, 2007, **14**(3), 1-25.
23. Yu, Shien-Chiang. Design of a model of publication sharing and harvesting. *The Electronic Library*, 2008, **26**(4), 582-93.
24. Novak, J.R. & Pardo, L.A.. The evolving nature of faculty publications. *Legal Ref. Ser. Quar.*, 2007, **26**(1-2), 209-32.
25. Armstrong, M. & Stringfellow, J. Promoting faculty scholarship through the university author recognition bibliography at Boise State University. *New Review of Acad. Libr.*, 2012, **18**(2), 165-75.

26. Tabaei, S.; Schaffer, Y.; McMurray, G. & Simon, B. Building a faculty publications database: A case study. *Public Serv. Quart.*, 2013, **9**(3), 196-209.
27. Berbegal-Mirabent, Jasmina and Ribeiro-Soriano, D. Enrique. Behind league tables and ranking systems, *J. of Serv. Theo. and Prac.*, 2015, **25**(3), 242-66.
28. Green, Robert G.. The paradox of faculty publications in professional journals. *Social Work in Health Care*, 2005, **41**(3-4), 103-08.
29. Glover, S.M., Prawitt, Douglas F. & Wood, David A. Publication records of faculty promoted at the top 75 accounting research programs. *Issues in Account. Edu.*, 2006, **31**(3), 195-218.
30. Fabianic, D. Publication profiles at point of promotion of criminal justice faculty, *J. of Crim. Just. Educ.*, 2012, **23**(1), 65-80.
31. Beattie, V. & Goodacre, A. publication records of accounting and finance faculty promoted to professor: Evidence from the UK. *Accou. and Bus. Res.*, 2012, **42**(2), 197-231.
32. Connor, E. Using Wiki technology to build a faculty publications database. *J. of Elec. Resou. in Medi. Lib.*, 2007, **4**(4), 11-25.
33. Newton, M.P.; Miller, C.C. & Bracke, M.B. Librarian roles in institutional repository data set collecting: Outcomes of a research library task force. *Collection Management*, 2010, **36**(1), 53-67.
34. Chudnov, Daniel, *et al.* Opening up OpenURLs with Autodiscovery. *Ariadne*, 2005, **43**. <http://www.ariadne.ac.uk/issue43/chudnov/>.
35. Change, Sheau-Hwang Chang. Full-text article linking: Where are we now? <http://www.white-clouds.com/iclc/cliej/cl23chang.htm>.
36. Anbu, JPK.; Kataria, S. & Ram, S. Dynamics of managing electronic resources: Electronic resource management system (ERMS) initiatives. *DESIDOC J. of Lib. & Inf. Tech.*, 2013, **33**(4), 300-06.
37. Zyzanski, S.J., *et al.* Academic achievement of successful candidates for tenure and promotion to associate professor. *Family Medicinem*, 1996, **28**(5), 358-63.
38. Henry, W.R. & Burch, E.E. Institutional contribution to scholarly journals of business. *Journal of Business*, 1974, **47**, 56-66.
39. Stahl, M.; Leap, T.L. & Wei, J.J. Publication in leading management Journals as a measure of institutional research productivity. *Acad. of Manag. J.*, 1998, **31**(3), 707-20.
40. Beckett, M.K.; Goldman, C.A. & Miller, T. Developing a higher education ranking system for Abu Dhabi. geomatics and Information Science of Wuhan University, 2012, **37**(Supp. 1), 20-4.
41. Meho, L.I. & Yang, K. Impact of data sources on citation counts and rankings of LIS faculty: Web of Science versus Scopus and Google Scholar. *J. of the Amer. Soc. for Inf. Sci. and Tech.*, 2007, **58**(13), 2105-25.
42. Jasco, P. Pragmatic issues in calculating and comparing the quantity and quality of research through rating and ranking of researchers based on peer reviews and bibliometric indicators from Web of Science, Scopus and Google Scholar. *Online Inf. Rev.*, 2010, **34**(6), 972-82
43. Rioux, Margaret A. Contributing to the literature migrating a local bibliographic database to the World Wide Web. *Sci. and Tech. Lib.*, 2001, **20**(1), 103-12.
44. Pinfield, S. The changing role of subject librarians in academic libraries, *J. of Lib. and Inf. Sci.*, 2001, **33**(1), 32-8.
45. Nolin, Jan Michael. The special librarian and personalized meta-services: Strategies for reconnecting librarians and researchers. *Library Review*, **62**(8/9), 508-24.

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