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The Role of Different Journal Access Models in Meeting the Information Needs of Shiraz University Researchers

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Abstract

The aim of the present study is to investigate and compare the role of journals with different access models (including print, database, print/database subscriptions) as well as unsubscribed models in meeting the information needs of Shiraz University researchers. Using a bibliometric method, the communication studies the references used in Shiraz University scientific papers indexed by Thomson Reuter's citation indexes (i.e. SCI, SSCI and Arts & Humanities CI) in 2010. A vast number of scientific journals are found to be available in Shiraz University, most of them repeatedly provided via different models. Over 90% of the journals receive no citations from Shiraz University researchers. The researchers generally tend to refer to unsubscribed journals as well as subscribed database journals. However, the journals mostly referred to by Shiraz University are found to be covered by database and print/database models. The uncitedness of a wide range of print journals confirms the rationality of the policy of discontinuation of print journals subscription in favor of e-collection development. It seems that the database model performs well not only in meeting the variety of information needs of the researchers, but also in providing the required core resources for the users. The unsubscribed model is revealed useful merely to fulfill the variety of the users' information needs; whereas it plays a minor role in providing the core needs of the researchers. The print model, following the database and the print/database models, is more or less effective in providing the core resources needed by the researchers of Shiraz University. Since a number of the core journals of Shiraz University are available in print model, it is suggested to renovate the subscription to the core print journals, preferably in online format.

Keywords: Databases, Information needs, Print journals, Core journals, Shiraz University

Introduction

The rationality of continuing print journal subscriptions has been widely questioned due to funding cuts and rising subscription prices, on the one hand and the increasing publication of digital resources, on the other. Discontinuing their print subscriptions, many libraries have begun their movements towards solely digital collections (Bracke & Martin, 2005; Zambareh,

2009). However, the movement is expectedly retarded due to many challenges, e.g. users' resistance caused by their skepticism regarding the possession of digital resources and a sense of attachment to the print collections. This makes librarians and information policymakers hesitate in terminating the print model. It is, therefore, necessary to investigate universities' approaches towards different journal access models and to clarify the effectiveness of each model in meeting their researchers' information needs.

In the late nineties, Shiraz University initiated subscription to full-text journal databases, while continuing its print journal subscriptions. Many of the journals were covered in both models, imposing double costs of subscribing, maintenance, space, binding, etc. In 2007 and 2010, the university made some initiations to replace print journals with database subscriptions. In 2012, the university entirely withdrew the print subscription from its journal provision agenda.

However, the policy has not been widely welcomed by the academic staff. Although their insistence on continuing access to print materials can be partly embedded in a deep-rooted habit or attachment, it can arise from real concerns, e.g. about permanent possession of e-collections and therefore accessibility in case of any disruption in the online subscription.

According to previous studies, the overall collection development in Iranian academic libraries does not commonly succeed in meeting the information needs of their faculty members. For instance, they confirm authors' high tendencies to refer to external resources not included in their home-library collections, negative attitudes about timeliness and completeness of the collections, and abundance of subscribed titles remained unused or uncited by the target communities (see e.g. Liaqat, 1989; Faraj-Pahlu & Moradi Moqaddam, 2005; Abdollahi, 2005). Few studies confirm positive attitudes of scientific communities towards replacement of print journals by e-journals (Abdollahi, 2005; Bigdeli et al., 2007).

It is obvious that subscription discontinuation is itself, part of collection development policies and must be founded on users' information needs (Mehrad & Hamdi-pour, 2001; Madison, 1991; Richards & Prelec, 1993). Defining users' information needs being crucial and determining for the decision, it is important to study the faculties' information needs, partially reflected in the references of their scholarly articles. As far as our literature review shows, there are no studies that deal directly with the use of journals with different access models at Shiraz University. Karimpur's study (2011) is among the rare instances examining the scientific references of Shiraz University researchers to determine the extent of use of print journals. The findings reveal that a scarce number of the references (10.13 percent) exist at the university libraries implying a low accordance between the print journal collection at the libraries and the faculties' information needs. However, Fahim Nia & Jafari (2009) found that 90% of the most cited publications in Shiraz University scientific papers in humanities discipline exist in their home-collections.

The present communication attempts to study the references of the scientific production of Shiraz University indexed by Thomson Reuter's citation indexes (i.e. SCI, SSCI and arts & humanities citation index) in 2010 and thereby to determine and compare the share of different access models in meeting the information needs of the university researchers. The

access models include subscription models (i.e. print, database and print/database journals) and unsubscribed model (including, but not limited to, Open Access (OA) papers published in journals, authors' websites or institutional/subject repositories; reprint articles directly exchanged between authors; external sources available e.g. through trial periods, authorized accounts from other universities where one is educated from or collaborates with, etc.).

By examining the scientific outputs references, one can reveal the access model(s) the users mostly refer to and the contribution of each of the models in meeting their information needs. This may reveal three dimensions of the researchers' information needs: 1) those journals receiving no references from Shiraz University are probably out of their research interest scope and can represent good candidates for weeding; 2) those containing the journals with high concentration of references from the university represent their core sources of information. The journals must be included in the university's collection development policies whatever the model could be; 3) the models providing a higher number of journals referred to by Shiraz University meet the variety of their information needs and should be provided.

Methodology

Using a bibliometric method, the present communication studies the references used in Shiraz University scientific productions indexed by Thomson Reuter's citation indexes (i.e. SCI, SSCI and Arts & Humanities CI). Given the wide variety of information sources and access models and their fluctuations over time, the study is limited to just the scientific productions published in 2010 in order to avoid the effect of the intrusive factors. Totally, 658 papers were identified carrying the name of Shiraz University in their affiliations (recorded in C1 or RP fields) in 2010. The total number of references used in the articles amounts to 13946. The references were extracted, parsed and then analyzed using Excel and SPSS.

In the second step of data gathering, we attempted to identify journal titles available through subscription models in Shiraz University. Obviously, the total number of journals probably available via the unsubscribed model cannot be estimated due to the wide and varied channels and possibilities. Given the long process of a research from the first sparks of the research ideas to the publication of the outputs, it is probable that the journal collections have been consulted during several years for the papers to appear in 2010. It is, therefore, necessary to identify the journal coverage of a relatively wide period of the past. A three year period from 2008 to 2010 was chosen to identify the print and database journals subscribed to. The former were identified by directly observing the Shiraz University collections, as well as by consulting the Research Council documents. The database model coverage was identified by verifying the journal lists of the databases the university subscribed to during the period mentioned.

Results and Discussion

The result of the model coverage verification is illustrated in Table 1. As seen, the subscription model in the years 2008-2010 encompasses 25256 journal titles. A high percentage of the titles are repeatedly provided. As expected, the highest percentage of the

duplication is related to the database model, where a large number of the titles are presented in more than one database. In the print model also, about half of the titles covered (49.67%) are found to be purchased repeatedly by two or more colleges. The print/database model, too, which itself represents the overlapping of the two former models, experiences duplication in two or more databases or print collections (Table 1).

Table 1
The frequency of journals covered by subscription models

Model	Total Titles		Overlapping titles		Unique Titles	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Database	23528	93.16	7000	29.75	16528	94.53
Print	1387	5.49	689	49.67	698	3.99
Print/Database	341	1.35	83	24.34	258	1.47
Sum	25256	100	7772	30.77	17484	100

By putting aside these duplicate titles, the total number of unique titles available at Shiraz University reduces to 17484, out of which the highest portion (94.53 percent) expectedly belongs to database journals and the lowest percentages to print or print/database models (3.99 and 1.47% respectively).

Although several attempts have been made to estimate the total number of journals published all around the world (Wellcome Trust, 2003; Tenopir, 2004; Mark Ware Consulting, 2006; Björk, Roos & Lauri, 2008; Björk et al., 2010), there are no exact, reliable statistics in order to judge the richness of Shiraz University collections against it. This is especially true for the scholarly, academic, reviewed journals which are subject to variation in definition. However, a rough comparison to the statistics provided by Björk et al. (2010) would reveal that Shiraz University provided 8.7% of the total 200,000 journals published worldwide in 2009. Also, based on the scholarly/academic journals statistics reported by Tenopir (2004) for 2003, and given their annual growth rate, one can roughly conclude that the University has less than 40.19% of about 43500 academic/scholarly journals available.

Due to the lack of integrated and detailed statistics about the number of journals in different access models in academic communities, it is not possible to comment on the relative richness of the resources available to Shiraz University compared to other universities, whether in Iran or abroad. There is, therefore, a serious need for comparative studies on Iranian and foreign universities' journal collections.

The variety of Shiraz University information needs

Table 2 shows the sources used in Shiraz University scientific papers and the frequencies of the references they received. As the column "Referenced journals" suggest, the unsubscribe model is ranked first regarding the total journals referred to by the university (72.51). The database model gains the second position with 24.55 percent of the total references used by the researchers. Although print/database model covers a low percentage of the total journals referred to (1.8), the model is found to outperform the other models, regarding the percentage

of the journals referred to in the model (39.53).

Table 2

Shiraz University references to different access models

Model		Referenced journals			Percent of non-referenced journals	References		
		NO	Percent			NO	Percent	Mean
			in all	in the model				
Unsubscribed		4108	72.51	--	--	6477	46.44	1.58
Subscribed	Database	1391	24.55	8.42	91.58	6648	47.67	4.78
	Print/Database	102	1.8	39.53	60.47	566	4.06	5.60
	Print	64	1.13	9.17	90.83	255	1.83	3.98
Sum		5665	100	32.40	67.60	13946	100	2.46

The number of references reflects a more or less similar picture. The database model with 6648 (equivalent to 47.67% of the total references) is ranked as first followed by the unsubscribed model with a slight difference (6477 accounting for 46.44 % of the total references). The print or print/database models experience the least usage levels, whether in terms of percentages of the references or the journals referred to.

The unsubscribed model gains the highest references (72.51 percent) compared to each of the subscribed models. This implies that the general tendency of Shiraz University researchers is to use sources outside their home collections that the university officially invests in. This finding is in line with Karimpur's findings (2011), which showed a very small percentage of references (10.13%) to the print journal collections existing at Shiraz University Libraries, implying a low compliance between information needs of the faculty members and the print journals. The findings are also in line with those of Najafi (2002), Cheraghi (2002), Ranjbar (2002), Ahmadzadeh (2007) and Riahi Nia & Zandian (2007), revealing low levels of usage of or references to print journals and therefore less coordination of the collections provided with the information needs of their target societies. However, the result is not in accordance to Ovens' (1995) confirming that in-house resources represent the most important way to access needed journals. Although the low usage of in-house collections is reported to be commonly observed, the percentages of the total references to the subscription models are even much lower for example, than that of Johnson (2000) and Swigger & Wilkes (1991) respectively reporting 66 and 57.8 percent of reference to their in-house journals.

Non-referenced journals in the models

The verification of the journals receiving no references from Shiraz University can shed more light on the users' information behaviors. According to Table 2, the largest percentage of the total non-referenced resources belongs to the database model (91.58 percent). This is not far from expectations, due to the collective provision of the journals via big-deal packages. However, the percentage seems to be unexpectedly high for the print and print/database models (90.83 and 60.46 percent respectively) given the selective provision of the journals, which is supposed to be based on the information needs of the target communities. The findings of Soleymani (1997) revealed a high number of unused print

journals. However, the percentage of non-referenced resources is far from the results of Kumar (1999), Johnson (2000) and Swigger & Wilkes (1991) reporting 25 to 44 percent of their home-collections remained non-referenced.

Due to the relatively low level of scientific production of Shiraz University compared to the range of the resources available, one cannot expect that the highest portion of the available resources receive references from the researchers. Therefore, the absolute figures of references to each model cannot determine whether the model is ideally used. However, the comparison of the models can recognize the most attractive and useful models to users.

The print/database model experiences the least fraction of non-referenced journals and thus the highest efficiency in meeting the users' information needs. This may imply the effective interaction of the selectivity in journal provision and the advantages of the online format. In other words, the high portion of the non-referenced journals in database and print models confirm that neither the easy access to digital sources nor the selectivity in journal provision will solely ensure a high usage. Fahim Nia & Jafari (2009), Soiger & Wilks (1991) and Meyer (2006) found the availability to be among the factors improving journals citation rates.

The core journals of Shiraz University

The average of references can depict the concentration of the sources meeting the information resources needed by the researchers in each model, i.e. the University core journals. As seen in Table 2, the print/database model gains the highest average of references (5.60 references per journal). The database model (with 4.78 references per journal) is ranked second. The print and unsubscribed models with respectively 3.98 and 1.58 references per journal achieve the relatively lowest averages.

Given the models differences in number of journals covered, it is necessary to test the significance of their mean differences. The results of the ANOVA test reveals that the models are significantly different in their mean references received (F= 103.32, P=0.000). The results of Scheffe test shows that the unsubscribed model gets significantly fewer references than the database model (Mean difference = 3.2) and the database/print model (Mean difference = 4.02). The finding, too, confirms the interacting impact of the selective nature of single-title acquisition and accessibility in journal usage rate.

By comparing the research findings on the references percentages and averages (Table 2), it can be inferred that Shiraz University researchers generally tend to refer to unsubscribed as well as database journals. The models are therefore effective in meeting the diverse information needs of researchers. While the database access model, accompanied by print/database one, are effective in providing resources most frequently referred to, i.e. the core journals of the university. In other words, although the models invested in remain largely non-referenced, they succeed in providing the core journals covering the research interests of the community.

These findings appear to be inconsistent with Fahim Nia & Jafari's (2009). They showed that 90% of the most cited publications in humanities scientific papers of Shiraz University

exist in their home-collections. Zandian & Riahi Nia (2007), too, showed that Iran, Tehran and Tarbiat Modarres Universities have the highest rate of citations to their in-house collections. They concluded that the collections are largely successful in meeting the information needs of the researchers. The apparent inconsistency with the present study's findings may be attributed to the differences in the research limits regarding the access models and the disciplines studied, as the mentioned previous studies did not extend their analyses to further study the distinction between print and print/database access models.

Conclusion

A large number of journals were available at Shiraz University during 2008–2010.The richness of the collections cannot be judged due to the lack of statistics about other national or abroad academic milieus. A large portion of the journals are repeatedly acquired via different access models. Due to the heavy costs spent for database subscription, it seems crucial to evaluate databases overlaps before subscription. However, as Vaughan (2003) stipulates, given the gigantic coverage of journal databases, it is not possible to absolutely eradicate the overlap in databases a university is subscribed to. There may be some remedies to the problem for the print model, e.g. through centralized collection building, development of union catalogs to inform users about the collections gathered in other colleges, and implementation of inter-college document delivery services.

A large portion of the journals provided in 2008-2010 remained non-referenced in the university's scientific productions in 2010. The largest portion of the non-referenced journals belongs to the database model. The print/database model performs the best regarding the portion of the referenced journals and mean references received. This implies the defects of big-deal models and the importance of selectivity in journal collection building.

Since 2007, Shiraz University has been following the policy of substitution of print journals collections by e-collections, a policy pursued by many libraries around the world whether as an abrupt or gradual shift (Prabba, 2007; Sullenger, 2011). The results of the present study confirm the rationality of the decision, in that the print model mostly received no references. Furthermore, it has no significant role, neither in meeting the diverse information needs nor in providing the core resources mostly referenced by the researchers of the University. The findings are quite conceivable, when one remembers the librarians' complaints about considerable reduction in their users' visits to the libraries. The continuation of this policy is not, therefore, expected to worsen the collections deficits and, hence, the quality of the scientific outputs of the university.

Furthermore, database subscription has numerous advantages over the print one, particularly high speed and ease of access, reduction in overhead expenses; saving in library spaces; diminishing staffing, archiving and binding costs; simultaneous access; access to journals back issues and library holdings; full-text searching and accessibility; interactive communication with authors; and easy subscription (Rogers, 2001; Kalian, 2002, Smith, 2009). Consequently, reinforcing e-collections seems a very reasonable approach to library acquisition. However, successful transition to just e-collections, their efficiency and optimal

use depend strongly on suitable infrastructural requisites, whether educational (e.g. information literacy), technical (e.g. higher bandwidth, removing access limitations and filtering, high-tech computers and networks) and cultural (participation of researchers and academic staff in collection building) (Islami, 2007; Mehrbani Joveini et al., 2009; Abdollahi, 2005; Chang & Dole, 1996; Mehrad & Hamdi, 2001).

Furthermore, due to the existence of a number of the university's core journals in print as well as in the unsubscribed model, it is suggested to subscribe or to renovate the subscription to the journals, preferably in online format. It is also required to devise new services or improve the existing ones in order to enhance the journals availability. Strengthening inter-university document delivery services such as Amin Interlibrary Loan Initiative can be a good alternative for print articles provision.

In recent years, Iranian universities' access to journal databases has been discontinued due to the US sanctions against the country. Lack of access to the online journals, which are proved to have been considerably effective in meeting the information needs of the researchers, might seriously jeopardize their awareness of the latest information and research outcomes. Although Shiraz University has endeavored to compensate the deficits in the collections by devising alternative outlets, it is essential to substantially resolve the problem. Based on the results of the present study confirming the effectiveness of selectivity and accessibility in journal acquisition, the immediate temporary solution could be to select and acquire individual titles in electronic format and provide access to the selected journals via CD-based contents purchase, site license or pay per view model. Anyway, further study is necessary to investigate the consequences of the access crisis.

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