

# The Impact of Electronic Journals on Document Delivery Services

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## Abstract

Collection management policies of libraries were mainly shaped by in-house use of materials in the past. Yet the emergence of electronic journals and their availability through publishers' or aggregators' web sites is changing this practice considerably. Libraries are no longer limited with the "one source – one user" model. This paper investigates the potential impact of the availability of electronic journals through the web sites of publishers or library consortia on document delivery services. It reviews the relevant literature first and reports the findings of the study with regards to the provision of articles through electronic journals and its impact on the Turkish national document delivery service. It then compares the number of articles supplied through the service with that downloaded from publishers' web sites by the users of the consortium of Turkish academic libraries. Following questions are addressed: Is document "delivery" using traditional or electronic means becoming a withering practice in libraries? Would document delivery services exist as we know them today in the age of electronic journals, big deals, and library consortia? The paper discusses the implications of electronic journals available through big deals on national document delivery services along with some conclusions.

**Keywords:** document delivery services; interlibrary lending; remote document supply; electronic journals; Big Deal packages

## 1 Introduction

The emergence of electronic journals in the second half of 1990s has changed the ways by which information sources are used. Publishers soon realized that they could bundle electronic versions of their journals and make them available through the World Wide Web. They started to license packages of electronic journals to individual libraries and library consortia and the practice quickly became widespread, as the library world responded favourably. Initial high transitional costs from print to electronic journals went down. Many university libraries began using either integrated library automation systems or commercial off-the-shelf packages that support collection management of electronic journals.

Libraries were ready to abandon the centralized "one source – one user" model of the print world. Whereas a print journal in a library can only be used on-site by a single user at any given time, an electronic journal can be used simultaneously by many through distributed high-speed networks. Users, too, responded enthusiastically and "accessed the electronic versions more than ten times as often as the print versions" (Morse & Clintworth, 2000), as they realized that they could get access to electronic journals from their desktops without even setting a foot in their libraries. Document delivery services such as that offered by the British Library Document Supply Centre (BLDSC) were also quick to adopt the new ways to deliver documents electronically to the users' desktops (British Library, 2002a; 2005a).

This paper aims to review the potential impact of electronic journals on document delivery services. We first summarize the major findings of the relevant studies reported in the literature. We then present the results of our study on documents supplied by the Turkish Academic Network and Information Center (ULAKBİM) using electronic journals over the last five years and compare this with the download statistics of the users of the Consortium of Turkish University Libraries (ANKOS). We discuss the potential impact of electronic journals available through big deals on interlending and document delivery services.

## 2 Literature Review

Studies reviewed by Solar (2000, 2001) reflect the early thinking about the potential impact of electronic journals on interlibrary loan (ILL) and document delivery. Some authors considered the possibility that access to

journal articles through networks would likely supplant ILL and document delivery and make such departments in libraries somewhat obsolete. Yet, they acknowledged that ILL departments would still be needed for older materials and books, as access to electronic journals were mostly limited to the current volumes in the early years (Bjornhuse, 1999; Baker & Jackson, 1993; Khalil, 1996; cited in Solar, 2001, p. 6-10). Older volumes of most journals were then unavailable in electronic form to fully meet the user needs (Jackson, 1998, p. 46). It was concluded that electronic resources cannot be used as a substitute for ILL and such services will remain “[u]ntil full-text can approximate what is available in print for both serials and monographs” (Milton, 1998, p. 19, cited in Solar, 2001, p. 14). Solar (2001), too, reached a similar conclusion when he reviewed the ILL requests of the University of North Carolina Davis Library in three consecutive years (1997-1999) and calculated what percentage of those requests could have been satisfied from full-text databases available in the library: “The availability of a large number of full-text journal titles is necessary in order for there to be any appreciable impact on interlibrary borrowing.” (p. 23).

The situation has quickly changed, however. Once publishers realized that they can market the older content to libraries in electronic form, they digitized the back runs of their journals and make them available through their web sites. For instance, the back runs of more than 2000 Elsevier journals, some going as far back as 1826, are available electronically. Similarly, the Institute of Physics (IOP), a non-profit publisher, provides the back runs of all of its journals (some dating back to 1870s) in electronic form starting from volume 1, issue 1.

Studies conducted during the transition period have unearthed the “appreciable impact” that electronic journals were seemingly having on interlending and document delivery services. Boukacem (2003) analyzed the ILL statistics in French university libraries over a 25-year period and found that the number of incoming ILL requests increased between 1975-1994 (from 100,000 to 700,000). Then it started to decline after the introduction of the Internet into French university libraries in 1994 and the availability of electronic journals over the network, coupled with the introduction of fee-based library loans and price increase in document supply services. Consequently, the number of ILL requests fell down to 550,000 in 1999. Similarly, the demand for ILL in the higher education (HE) institutions in the UK has fallen within the last five years. Some HE institutions experienced a drop of as much as 62% while large research libraries saw a decrease of 40% (Goodier & Dean, 2004, p. 207). The introduction of electronic journals was thought to be the reason for this decline. Annual surveys conducted at Spanish university libraries also showed a decrease of 17% in the use of document delivery services between 2000-2003, which is believed to be due to the “introduction of a critical mass of online journals from 2000 onwards” (Echeverria & Barredo, 2005, p. 146).

Individual libraries also experienced decreases in the number of document delivery requests and ILL statistics after the introduction of electronic journals. The demand for document delivery requests in the University of Glasgow Libraries declined nearly 80% between 1998/99 and 2001/02 (Kidd, 2003, p. 264). Some 22% of this decline was directly attributed to the Elsevier journal titles. Similarly, the analysis of four years’ worth of ILL statistics (1999-2003) at the University of Nevada at Reno “detected a marked increase in cancelled interlibrary loan requests . . . as the library’s electronic content increased” (Yue and Syring, 2004, p. 431).

The number of items supplied by the British Library Document Supply Centre (BLDSC) to remote users from business and industry, university libraries, and public libraries have considerably declined between 1998/1999 and 2000/2001 (by 16%, 18% and 35%, respectively) (British Library, 2002b, p. 22). BLDSC, the world’s biggest document supplier, acknowledged that “[a]s more researchers are using local electronic resources, the requests [BLDSC receives] are increasingly for ‘hard to find’ materials. As a result a slightly lower percentage has been satisfied within Library stock than in previous years.” (British Library, 2005b, p. 33, footnotes 7 and 8). The overall decrease in the number of requests may well be the reason why BLDSC seems to have stopped providing statistics in its annual reports on the number of items supplied to remote users from, among others, university libraries.

In addition to BLDSC, the impact of local electronic resources available through site-licensing programmes such as NESLI (National Electronic Site Licensing Initiative) on declining document delivery demand levels was acknowledged by others, too (e.g., Brown, 2003; Robertson, 2003). This is understandable because the availability of electronic journals through so called “Big Deal” arrangements completely changed the way that document delivery works. Libraries in the print world are limited with what they own. If they receive a request for a journal article which they have no subscription for, it has to be obtained from another library via ILL or supplied from a document delivery service such as BLDSC.

The scenario is quite different in the Big Deal environment, however. Libraries get access to all the journals of a given publisher or aggregator regardless of whether they have subscriptions to print copies of those journals or

not. Requests that used to be satisfied through ILL or a document delivery service in the print world are simply satisfied from the electronic copies of journals which are part of the deal. Users may not even be aware of, nor do they have to, the fact that their library does not have a print subscription for a specific journal. Moreover, Big Deal users take advantage of this opportunity and use the journals collection much more heavily (Nicholas, Huntington, & Watkinson, 2003).

Similarly, requests for older volumes in the past have primarily been satisfied through document delivery services such as BLDSC. As we pointed out earlier, publishers digitize older volumes of their journals and make them available as part of the Big Deals, thereby reducing the demand for older materials.

The Big Deal was readily accepted by most libraries. Almost all university libraries in North America have taken up the Big Deal, although “the reception has been somewhat mixed” in the UK (Nicholas, Huntington, & Watkinson, 2003). Jackson (2005a) points out the anecdotal evidence that document supply “has decreased as a direct result of the big deals” (p. 173). She consulted a dozen of academic and research libraries to find out the impact of the Big Deal on ILL volume. In general, the demand for document supply in the libraries consulted was declined. For instance, the consortium of OhioLink comprising 79 libraries reported 40% decrease in photocopy requests within the past five years. Elsewhere, Jackson (2004b, 2004c) discussed the future of interlending and addressed the issue of ILL being eliminated by the availability of electronic journals through Big Deals. Having reviewed the most recent literature (1999-2004), San Josè and Pacios (2005) also stated that the remote document supply “has decreased as a result of the introduction of the electronic journal bundles” (p. 192).

Contrary to the findings of most studies, the analysis of the preliminary statistics for 2003-2004 show that interlending and document supply continues to grow in the largest research libraries (members of the Association of Research Libraries) in the United States and Canada (Jackson, 2004a). As pointed out by San Josè and Pacios (2005), despite the availability of electronic journals, remote document supply does not disappear as it was first thought (p. 192). Jackson (2005a) offers a number of reasons as to why the demand for document supply is on the rise. “Users were able to discover articles via open linking Technology,” as it “has made ILL faster and more efficient” (p. 173). Users find more citations through search engines such as Google, which subsequently increases the demand for document delivery. “The big deal, which increase locally available content, and the OpenURL standard, which links to locally available content and seamlessly permits users to initiate ILL requests from bibliographic citations, combine to enhance both the availability and ‘findability’ of resources – a form of document delivery in itself.” (p. 174). ILL departments are providing timely services, as the discovery of citations is still complex for some users. Many libraries have yet to implement the OpenURL standard and open linking technology.

Jackson (2004a) refers to four trends that might improve the ILL process over the next decade: open linking technology, ISO ILL protocol communication standard, user-initiated services, and innovations in discovery process. Jackson (2005b) points out that libraries are:

*increasingly adopting standards-based products that include Z39.50 for searching, ISO ILL Protocol for ILL communication, NISO Circulation Interchange Protocol (NCIP) for user-initiated circulation, and the Open URL to link directly to electronic resources. . . . These trends highlight a key change in providing resource sharing services. Library-centric policies, rules, and procedures are no longer acceptable in an environment that is increasingly customer-focused (p. 213).*

It appears that the introduction of electronic journals through networks has completely transformed the ways by which libraries provide ILL and document delivery services. What follows is an account of the use of electronic journals by the document delivery service of ULAKBİM within the last five years and its likely impact on resource sharing. The growing use of electronic journals, and the consequences of Big Deals on document delivery functions of both Turkish university libraries and ULAKBİM are discussed. Suggestions are offered to transform and improve the electronic document delivery services of ULAKBİM.

### 3 Methodology

There are more than 80 universities in Turkey. The total budget of 53 Turkish public universities is about five billion Turkish Liras (*circa* 3.5 billion USD) in 2005, of which 0.73% (or *circa* 27 million USD) is spent for the acquisition of publications (Kaygusuz, 2005). Some 81% of university libraries spend less than 35 USD per user to buy/license publications. Some spend even much less (e.g., 5 USD per user). Turkish university libraries set up a voluntary consortium (ANKOS) in 2000, through which their users get access to licensed bibliographic databases and electronic journals (Karasözen & Lindley, 2004).

Data used in this paper come from the Turkish Academic Network and Information Center (ULAKBİM). ULAKBİM runs both the Turkish academic network and provides national document delivery services. ULAKBİM has an extensive print journals collection (*circa* 10,000 titles) with back runs of more than 20 years. Also, ULAKBİM provides online access to the electronic versions of more than 5,000 electronic journals. The number of current journal titles (both print and electronic) available in 2004 was about 7,000. ULAKBİM spent 3,337,126 USD in 2004 for subscription and license fees. Some 40% (1,343,126.00 USD) of its total acquisitions budget was spent on electronic journals (TÜBİTAK, 2005, p. 30).

ULAKBİM's collections and information services are mainly used by universities. Documents unavailable through local university libraries are usually requested from ULAKBİM. ULAKBİM provides photocopies of the requested articles from its collection of both print and electronic journals. The last five years' document delivery data were used in this study. Major findings are summarized below.

## 4 Results

As of 2004, ULAKBİM maintains a collection of 6949 journal titles. Of these, ULAKBİM owns electronic archival copies of 1677 journal titles (24%) and provides access to 2864 journal titles (41%) through publishers' or aggregators' web sites. The rest (2408 or 35% of all journal titles) are in printed form (TÜBİTAK, 2005). The total number of electronic journal titles has been about 8,000 in 2005. A total of 391,195 document delivery requests were submitted to ULAKBİM between June 26, 2000 and June 30, 2005 (Table 1). The success rate was 71%.

While the total number of document delivery requests decreased gradually within the last three years, the satisfaction rate increased (from 70% to 78%) due to the number of journals available in the collection (mostly electronic journals). Compared to the peak number of requests in 2002/03, the total number of requests received in the most recent year (2004/05) decreased about 16%. Yet, the fulfilment rate decreased only 7% in the same period.

Year	Total # of requests	Total # of requests fulfilled	Percentage (%)
2000/01	57,980	37,740	65
2001/02	80,140	54,977	69
2002/03	89,945	63,139	70
2003/04	87,962	62,813	71
2004/05	75,168	58,830	78
Total	391,195	277,499	71

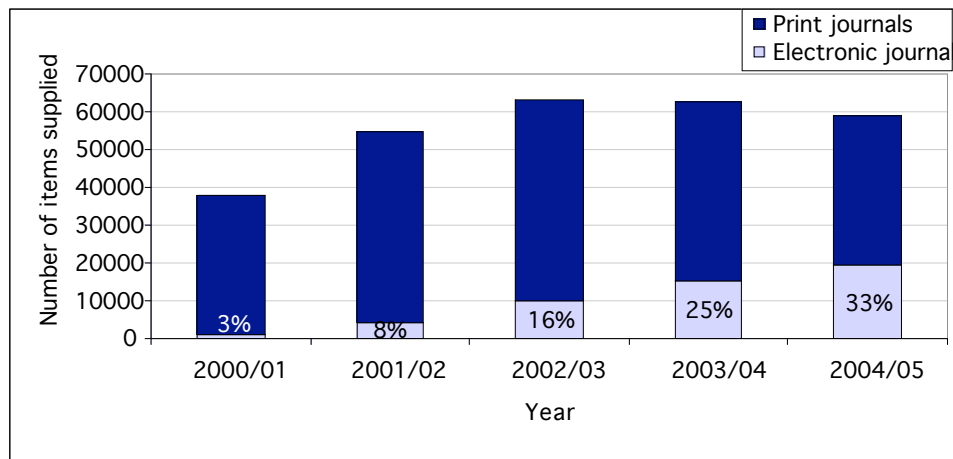
**Table 1: Number of items supplied by ULAKBİM (2000-2005)**

Year	# of items supplied from e-journals	Total # of items supplied	Percentage (%)
2000/01	1,061	37,740	3
2001/02	4,302	54,977	8
2002/03	9,989	63,139	16
2003/04	15,477	62,813	25
2004/05	19,642	58,830	33
Total	50,471	277,499	18

**Table 2: Number of items supplied by ULAKBİM from electronic journals (2000-2005)**

Of the requests fulfilled within the last five years, 18% were satisfied by means of ULAKBİM's electronic journals collection (Table 2). Almost 70% of the requests satisfied from electronic journals were submitted to ULAKBİM within the last two years. Fig. 1 shows both the total number of documents supplied and the proportion of those supplied from electronic journals. While the number of (and the percentage within the overall) requests fulfilled from electronic journals collection of ULAKBİM is growing steadily, the overall number of use (both in terms of the number of documents supplied and the number of in-library use) is decreasing since 2003 (TÜBİTAK, 2005, p. 31). This is also the case for in-library use in ULAKBİM (TÜBİTAK, 2005, pp. 31-32). The percentage of requests fulfilled from electronic journals has quadrupled

between 2001/02 and 2004/05. Figures are quite similar to that reported by BLDSC (14% in 2002/03, 22% in 2003/04, and 28% in 2004/05). The British Library acknowledges that “the percentage of material delivered electronically is growing . . . as negotiations with publishers increasingly allow permission to be delivered via Secure Electronic Delivery, a new service launched in 2004/05” (British Library, 2005b, p. 33). The increase in the number of requests fulfilled from electronic journals in ULAKBİM is impressive even though ULAKBİM has yet to sign similar agreements with publishers to get permission to deliver articles electronically. Currently, ULAKBİM fulfills the increasing percentage of document delivery requests from electronic journals. Yet, articles get delivered to users via traditional means.



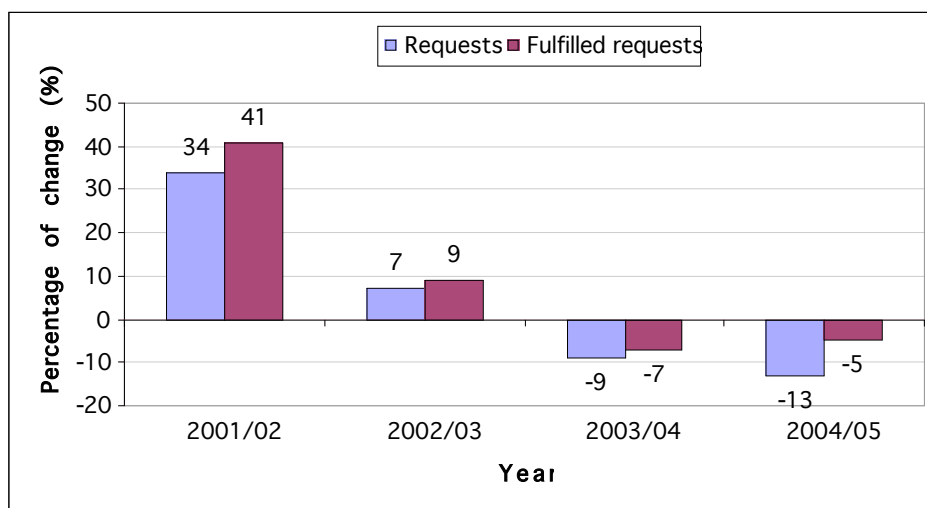
**Figure 1: Number of items supplied by ULAKBİM (2000-2005)**

Some 3742 unique electronic journal titles were used to fulfil 50,471 requests. Highly used journal titles satisfied the majority of electronic document delivery requests. For instance, 133 (or a mere 3.6%) of all electronic journal titles satisfied one third of all requests while 533 titles (14.3%) did almost two thirds. The last one third of the requests were satisfied from 3209 journal titles (almost 86% of all journal titles) which were rarely used. The dates of issues of electronic journals from which requests were satisfied ranged between 1917 and 2005. Articles of three years of age satisfied the highest percentage of requests (13.6%) while the demand for older articles gradually declined. More than half the requests (median use age) were satisfied from the issues of journals that appeared within the last five years. The 90% obsolescence rate was 15 years (cf. Tonta & Ünal, 2005).

Two thirds (66%) of requests received by ULAKBİM came from universities (Table 3). The success rate was similar (71%). Yet, requests coming from universities decreased even further (21%) within the last three years while the percentage of decrease in the total number of requests fulfilled was much lower (11%). Year on year changes in the percentage of requests received from universities and the percentage fulfilled is given in Fig. 2. While the percentage of requests coming from academic users has decreased more sharply, the percentage of fulfilled requests decreased more slowly. This might be due to the fact that the overall fulfilment rate of ULAKBİM has increased about 13% from 2000/01 to 2004/05, which should also be reflected in the fulfilment rates of academic requests.

Year	Number of requests	Number of requests fulfilled	Percentage (%)
2000/01	41,548	27,297	66
2001/02	55,653	38,353	69
2002/03	59,684	41,716	70
2003/04	54,378	38,710	71
2004/05	47,168	36,951	78
Total	258,431	183,027	71

**Table 3: ULAKBİM's fulfilment rate for academic document delivery requests**



**Figure 2: Year on year change in demand and fulfilment rates in academic sector**

The availability of electronic journals through university libraries seems to be the main reason behind such sharp decreases in the percentage of items requested by and supplied to academic users by ULAKBİM. More universities get access to electronic journals through consortial agreements. For instance, the number of databases, including some Big Deal electronic journal bundles such as ScienceDirect of Elsevier, licensed by the members of the Consortium of Turkish University Libraries (ANKOS) has increased from 33 in 2001 to 64 in 2005. Consequently, the number of articles downloaded by users of the consortium members is ever increasing: Turkish academic users downloaded 2.3 million articles in 2002, 6 million in 2003, and 8.5 million articles in 2004. Some 56% (or 4.5 million articles) of the downloaded articles were from Elsevier's ScienceDirect database. The number has almost quadrupled between 2002 and 2004 (Kaygusuz, 2005).

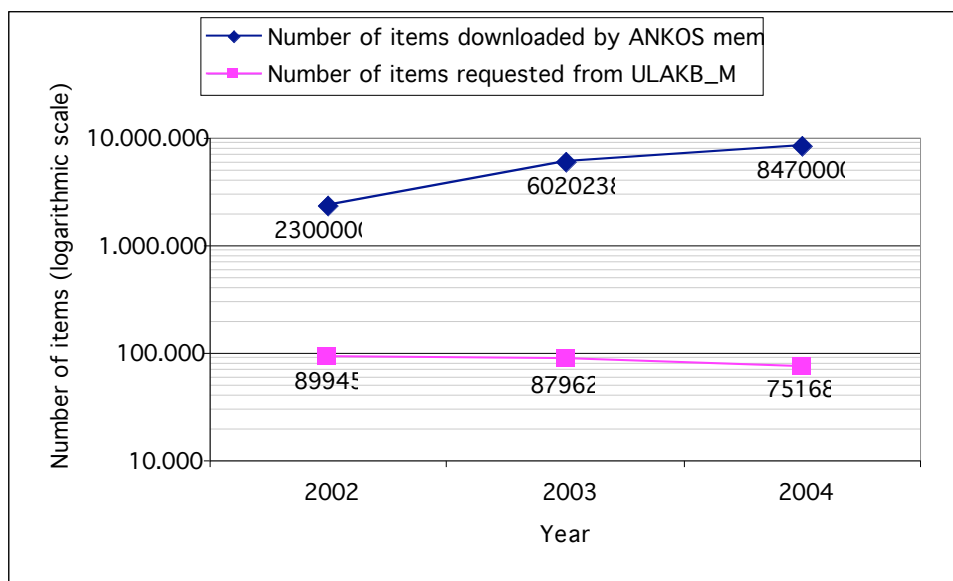
Since university libraries were in general not well-stocked in terms of current journals up until recently, this initial steep increase in the number of downloaded articles may be explained by the insatiable hunger of Turkish academia for full-text articles that became instantly available through electronic journal bundles. Moreover, users are able to access articles electronically not only from subscribed journals (in print format) but also from non-subscribed journals. This has a tremendous impact on ILL and document delivery services. Whereas an article request from a journal title that a library has no print subscription has had to be fulfilled via ILL or a commercial document delivery service in the traditional environment, it can now easily be fulfilled electronically from a non-subscribed journal that is included in the electronic journal bundle as part of the Big Deal agreement. San José and Pacios (2005) pointed out a trend observed in the OhioLink Consortium (made up of 79 libraries) in the United States: that "some of the most used journals are not among those which the libraries had in paper format" and that half the downloaded articles "were not from journals in the original collections of the institution" (Nicholas et al. 2003, cited in San José & Pacios, 2005, p. 190). This is defined as "cross access" and happens to be the case for the members of the Turkish consortium as well. For instance, the cross access rates for 11 different electronic journal packages licensed by the Middle East Technical University (METU) Library in 2004 ranged between 61% (ScienceDirect of Elsevier) and 97% (Emerald), average being 62% (Bati, 2006, p. 43).

It is interesting to note that METU Library has print subscriptions for 416 out of 4,742 journal titles (9% of all titles) available in 11 journal packages. Yet, 9% of all journal titles satisfied 38% of all the downloaded articles while the rest (91%) (for which METU Library has no print subscriptions) did 62%. These percentages show that not all journal titles in Big Deal bundles are equally used. Of the 11 electronic journal packages, only American Chemical Society (ACS) and American Institute of Physics (AIP) generated fewer downloads than expected. In other words, users downloaded more often from journals which METU Library chose to subscribe in print format than they did from non-subscribed journals.

The average cross access rates are much higher for poorly stocked university libraries. Karasözen and Lindley (2004) reported cross access rates as high as 100% for Institute of Physics (IOP) journals. Some 21 consortium members licensed the IOP database in 2003. The IOP package has 66 journals and the Turkish university libraries aggregately subscribed to 52 print journals at that time. (Bilkent University Library subscribed to 12 IOP journals in print while seven libraries did not even have a single subscription.) Cross access rates ranged between 47% and 100%, average being 82% (Karasözen & Lindley, 2004).

These statistics and Fig. 3 below explain why Turkish consortium members enthusiastically embraced the Big Deal agreements. As was indicated earlier, the number of items downloaded from electronic resources by consortium members increased almost exponentially in three years (from 2.3 million in 2002 to 8.5 million in 2004) whereas the number of items requested from ULAKBİM decreased gradually. Note the logarithmic scale of Fig. 3 and the difference of about two orders of magnitude between the number of items downloaded and the number of items requested. The former is close to 10 millions while the latter is less than 100,000. From the ILL and document delivery point of view, it is highly likely that some of those downloaded articles would have been requested from ULAKBİM were they not available electronically by means of Big Deal's cross access permissions.

The average unit cost of downloading an article from electronic journals within the ANKOS consortium has decreased tremendously, as the number of items downloaded mushroomed. A downloaded article costs a member library an average of 1.22 US Dollars (minimum 10 cents, maximum 11.90 US Dollars) (Bati, 2006, p. 92). The unit cost for almost half the downloaded articles (excluding non-subscription costs) was less than 50 cents per article (Kaygusuz, 2005). These figures are just a fraction of the average cost (about 4 US Dollars) of a document delivery transaction excluding subscription costs (Ünal, 2002).



**Figure 3: Number of items downloaded by ANKOS members vs. number of items requested from ULAKBİM (2002-2004)**

*Source:* Download statistics come from the Consortium of Turkish University Libraries (ANKOS) (Kaygusuz, 2005; Karasözen, 2005). Document delivery statistics are from the Turkish Academic Network and Information Center (ULAKBİM).

## 5 Discussion

Our findings clearly indicate that the Big Deal has triumphed in Turkey. Almost all Turkish university libraries are members of the consortium (ANKOS). This is primarily due to the fact that most university libraries have built rather shallow print serials collections over the years. They usually did not have resources to do so. Newly established universities did not in general have time or resources to develop strong collections. Thus, they were eager to accept the Big Deal agreements. Once users discovered the rich resources that became available electronically through their libraries, they took advantage of it. The number of items downloaded doubled (or even tripled in 2003) each year in the first couple of years.

The number of document delivery requests compared to download figures has been quite modest. This can in large part be explained by the convenience of what is called “instant gratification”. Users do not wish to go through the time-consuming procedure of placing a request and then waiting for it to be delivered for days if not weeks. Instead, they prefer to get access to those articles instantly from their desktops and download them if needed. Big Deal users view more journals because of the “greater choice on offer” and hence download more

articles (Nicholas, Huntington, & Watkinson, 2003). Big Deals seem to have somewhat decreased the need for document delivery services, as has been the case in the United States, too (Jackson, 2005a, p. 173).

From the library budgets point of view, it is generally much cheaper to download articles from publishers' web sites than to get them through ULAKBİM. The average cost of an article (excluding subscription costs) supplied by ULAKBİM through traditional means was about an order of magnitude more than that of a downloaded article (Ünal, 2002). Moreover, libraries no longer have to deal with the costly process of handling check-in, binding, etc.

The discrepancy between the percentage of journal titles available electronically (65%) and that of requests fulfilled through electronic journals collection of ULAKBİM (18%) cannot simply be explained by the fact that the older issues of some electronic journals are sometimes not available electronically. More than half the requests were made to the most recent five years of journal articles, not to the older ones. Moreover, the majority of requests were satisfied by a relatively small number of ("core") journals in electronic form. Staff should be encouraged to use electronic journals to fulfill requests. Publishers price older, less used materials cheaper, as they "have grown fat on Big Deals" (Nicholas et al. 2005, p. 1460). Yet the older issues still cost dearly and they did not get used often for document delivery purposes in ULAKBİM.

The median use age in national document delivery services differs from that of digital libraries of publishers. More than half the requests were made to journal articles published within the last five years, whereas more than half the use in Blackwell's Synergy (containing some 650 journals) were to the current year of journals (Nicholas et al., 2005). The BLDSO findings are similar to ours: 27% of requests made in 2003 were satisfied from the most recent two years. This is explained by the fact that "the main demand being felt by publisher's digital library site, with BLDSO taking the demand for the more esoteric or non-digital journals which the publishers cannot yet provide." (Brown, 2004; cited in Nicholas et al. 2005, p. 1444).

## 6 Conclusions

The convenience, the time it takes for users to get access to an item, the unit cost, and the cross access facilities, among others, have made the Big Deal arrangements very popular for Turkish universities. Meanwhile, document delivery via traditional means is quickly becoming a much less preferred method for users to get access to information sources. Users are prone to think that "if it is not on the Web, it does not exist." Therefore traditional document delivery routines of libraries have to be transformed and adapted to the users' environment. Member libraries of ANKOS should strive to increase the number of electronic journal packages with retrospective volumes and cross access permissions.

Similarly, ULAKBİM can license more electronic journal packages and make them available to users. ULAKBİM is considering signing up nation-wide licenses on behalf of Turkish university libraries and providing access to electronic journals through the Turkish Academic Network (ULAKNET). ULAKBİM already provides network services for all Turkish universities and it owns the wherewithal to provide networked access to shared/licensed information resources, too. Also, ULAKBİM already has on its own servers the full electronic archives of Elsevier (ScienceDirect), IEEE, and IOP journals (TÜBİTAK, 2005, p. 29). ULAKBİM uses these collections for document delivery purposes as well as for the use of walk-in users. They are not open to remote users of academia, however. This is hardly the best way to handle the use of precious resources, not to mention relatively high unit costs. ULAKBİM should pioneer such cooperative schemes mandated by its by-law and share its rich electronic journals collection by providing networked and consortial access. This also will lower ULAKBİM's unit cost of supplying an article. It is much cheaper to use electronic journals for document delivery purposes.

As almost all university libraries are members of the ANKOS consortium and ANKOS has six years of licensing experience, ULAKBİM should cooperate with ANKOS in signing up nation-wide Big Deal licenses. The fact that users download more often from journals which are subscribed to in print format than they do from non-subscribed journals should be taken into account when renewing the terms of Big Deal licenses. The most heavily used titles should be monitored, along with the use of older material, to come up with more sound electronic collection management policies.

During the transition period ULAKBİM can license databases that are not licensed by ANKOS for the users of the ANKOS members. In order for users to get access to documents quickly, ULAKBİM needs to sign agreements with publishers, as BLDSO did, so that requested articles can be delivered electronically to users' desktops. ULAKBİM's electronic document delivery services should be visible in the web sites of member



libraries of ANKOS. Users should be encouraged to try ULAKBİM's electronic document delivery services for the items that are not available through their libraries.

It is likely that document delivery services as we know them today would gradually decrease and eventually wither away in the age of electronic journals, as more journals (including their back issues) become available online. Publishers' web sites, and the proxies thereof owned by libraries or consortia, would likely supplant the withering practice of document delivery function in the foreseeable future.

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