



PERSPECTIVES ON...

New Electronic Resources Management System for the ANKOS Consortium

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ARTICLE INFO

Article history:

Received 23 May 2012

Accepted 6 November 2012

Available online 11 December 2012

Keywords:

Electronic resources management system

Electronic information resources

Evaluation of databases

Anatolian University Libraries Consortium

ABSTRACT

The Anatolian University Libraries Consortium (ANKOS), which was originally established to coordinate university libraries' electronic serials purchases, today plays an active role in selecting, providing access to, managing and evaluating electronic information resources in Turkey. A substantial volume of subscriptions and purchases of e-journal, e-book and e-reference resources is conducted through ANKOS. In order to measure the usage rate of these resources, to conduct cost analyses and to use the findings in strategic planning cycles of both the institutions and the consortium, a New Electronic Resources Management System (ERM) has been developed by ANKOS. In this study, the authors explain how the new system was developed, its technical features, data entry and collection, the system's contribution to the collection of institution and usage statistics, and its impact on strategic planning. Available statistical facts are also provided to illustrate the development and the impact of the new ERM system.

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INTRODUCTION

The resources available in libraries are rapidly increasing in number and changing format from print to electronic. In this regard, e-resources' shares in both library collections and budgets are dramatically increasing (Hogarth & Bloom, 2008, p. 322). Library operations such as acquisition, cataloging, circulation and periodicals are all handled using library automation systems. The rapid increase in the number of electronic resources since the 1990s has created a demand for the management of these resources. In 1995, field 856 has been included in MARC to address issues regarding access to e-resources; however, despite the increase in the ease of access to information sources, challenges concerning destination (Hogarth & Bloom, 2008, p. 323) have continued to prevail. Administrative data for e-resources are kept in spreadsheets and other receptacles, and not in the library catalog. In order to address this need by establishing ERM standards for the first time, a series of meetings have been organized in the United States in 2002 to bring together experts from university libraries, associations, NISO and company representatives.

In these meetings, must standards of Electronic Resources Management (ERM) systems and cooperation issues were discussed (Hogarth & Bloom, 2008, p. 328). During the course of this process,

some institutions (e.g. UCLA's ERDb, North Carolina State University's e-Matrix and MIT's Vera) chose to improve their ERM systems (Fons, 2008, p. 365). The launch of "Electronic Resource Management" by Innovative Interfaces in 2004 was followed by other commercial vendors with a series of releases, e.g. Meridian by the ILS vendor Endeavor and Verde by Ex Libris. In the meantime, Serial Solutions, a publication access management service, introduced their Electronic Resource Management System. Noncommercial organizations such as the Colorado Alliance ("Gold Rush") also appeared in the market during this period (Fons, 2008, p. 365). As a result both the number of commercial firms focusing on e-resource management and the number of locally developed ERM systems increased substantially. While some institutions preferred to purchase their ERM systems from their automation systems vendors, others have opted to develop their own ERM systems. In a similar fashion, some consortiums have also chosen either to develop their own ERM systems independent of their ILS systems or to purchase a standalone ERM system.

Parallel to these global developments, the number of universities, the number of database subscriptions (as consortiums) and amounts paid for library databases had begun to rise in Turkey. The number of universities, which was 82 in 2005, had already reached 167 by 2010. The number of database subscriptions, which was 34 in 2005, had already reached 81 by 2010. This dramatic increase resulted in requiring both the collection and the analysis of such administrative data as licensing costs, usage rates and subscription fees. Upon evaluating the locally-developed commercial ERM systems, ANKOS decided to develop its own ERM system, taking into consideration the standards set by the Digital Library Foundation (DLF), Sushi and COUNTER. Lack of ERM modules in the locally-developed automation systems, the high prices

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of alternatives, data security and privacy issues, non-Turkish interfaces, and lack of IT staff in university libraries have all strengthened the case for ANKOS' commissioning the development of an ERM system that will allow the management of administrative data both by ANKOS itself and by its members.

INITIAL STEPS TOWARDS INTER-LIBRARY COLLABORATION: FOUNDATION OF ANKOS

The creation of digital collections by means of the internet and internet-based technologies has made access to and management of the electronic databases, electronic books and other electronic contents evermore complicated. This new ecosystem of information exchange provides new universal opportunities for cooperation and trade and requires collaboration between all interested parties. Since early 2000s, the major libraries in the world have worked together to form consortia in order to acquire electronic resources under better economic conditions and to increase the accessibility of information to users.

The Anatolian University Libraries Consortium (ANKOS) was established in Turkey in 1999 for enabling the university and research libraries to access the maximum number of electronic information resources at the best price and to share the investments in these products within the framework of economies of scale. Other priorities were to provide the highest level of access to the global information network for academics and students, to increase the supporting role of libraries to education and research, and to conduct joint activities (ANKOS, 2010a). On the eve of the third Millennium, with the collaboration of EBSCO, one state and three foundation university libraries in Turkey signed a contract for the joint purchase of two databases for 1999. The consortium's development began in earnest a year later, when seven other state university libraries and the Turkish Academic Network and Information Center (ULAKBIM) joined the EBSCO contract for 2000; nine institutions joined to the agreement with Academic Press for IDEAL; and twelve jointly subscribed to MathSciNet (Karasozen & Lindley, 2004: 402). The number of members of ANKOS reached 39 in 2001 and license agreements were signed for 9 databases. By 2010, the number of members had reached 120 and the number of databases for which license agreements had been signed had risen to 81.

ANKOS is a member of the Southern European Library Link (SELL), the International Coalition of Library Consortia (ICOLC), the Scholarly Publishing and Academic Resources Coalition (SPARC), and Counting Online Usage of Networked Electronic Resources (COUNTER). With approximately 50 volunteers and membership in international associations,

ANKOS is one of the most important consortia and professional associations in the world. "It is one of the five largest consortia in Europe amongst the consortia related to electronic publishing" (Yanaz & Kafalı, 2010: minute 13:20). ANKOS organizes annual conferences targeting participation from members, publishers and intermediary firms. Donations received from the sponsoring firms are used towards financing adoption of new technology, and organization of meetings and workshops. It should also be noted that all ANKOS staff is composed of volunteers from ANKOS member libraries' staff.

Since its establishment in 2000, ANKOS' organizational structure has gone through three major amendments to achieve the current structure shown below in Fig. 1. The creation of three new units, namely the Negotiating Group on Databases, the Research Groups and the Working Groups, has significantly improved operational effectiveness.

In this study, we will be providing a brief description of the aforementioned units along with the activities of the Statistics Group, which is responsible of executing the development of the ERM system.

The Negotiating Group on Databases (NGD) was established in order to identify the electronic resources which might be subscribed to within the scope of the consortium; its remit also includes determining or developing pricing model(s) that fit best into the economic, legal and academic structure and to follow consortium activities throughout the world and cooperate with other important consortia. The NGD also follows developments within the publishing world and uses the information obtained for the benefit of the members of ANKOS in accordance with their requirements (ANKOS, 2010b).

ANKOS Database Liaisons are expert librarians working in member libraries who have a deep knowledge of the databases they are in charge of. They work together with the Steering Committee, Working Groups, members and publishers/vendors.

Research Groups are temporary groups formed in order to conduct activities related to new practices and developments in the fields of databases and librarianship. These groups present reports of their activities to the ANKOS Steering Committee which shares such reports with all its members. Electronic books (2005), off-campus access (2006–2007), remote access (2006–2007), and common interface (2006–2008) groups have been the subject of such temporary groups within ANKOS (Yanaz & Kafalı, 2010: minute 03:04). Currently there is a Research Group for collaboration, including interlibrary loan. Working groups sustain the continuous activities performed within the scope of ANKOS. Statistics, License Agreements, Public Relations, Open Access and Institutional Archives, Cooperation and Institutionalization are the working groups of ANKOS.

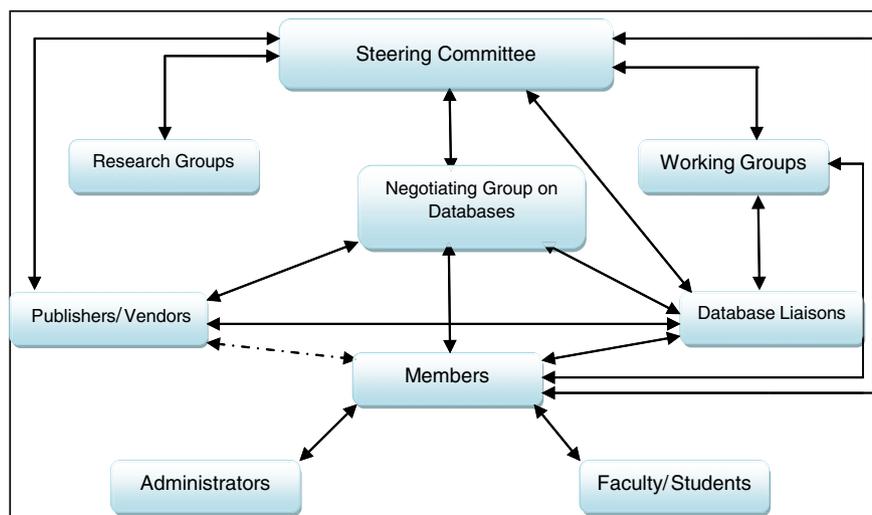


Fig. 1. Organizational structure of ANKOS.

DEVELOPMENT OF THE ANKOS ERM SYSTEM

Statistics regarding the use of electronic information resources is a much-debated subject all over the world, and international standards have begun to emerge in this area. Due to this need for statistical evaluation, which arose with the establishment of ANKOS, the Statistics Group was founded in 2003. Studies conducted by the Group are presented to the ANKOS Steering Committee. These studies are announced to the members during the annual ANKOS meetings and they also appear in the annual report.

The mission of the group is to gather quantitative data regarding ANKOS members and usage statistics from subscribed databases; to conduct cost-benefit analyses based on this data, and thus to lay a firm ground to be used by ANKOS when setting objectives and conducting further studies.

The aim of the group is to set standards for types of data to be collected for each database, to collect and update ANKOS member information, to ensure that database subscriptions are based on correct data and are properly evaluated, to conduct cost analyses by comparing total usage rates with costs in order to assist members in making sound decisions for subscription renewals, and to provide correct data regarding ANKOS' planning for the consortium (ANKOS, 2010c).

The Statistics Group, which had been conducting activities in line with its aim and responsibilities since its establishment in 2003, began to work on an Electronic Resource Management System (ERM) in 2005; the ERM system, then known as "ANKOS Online Transactions," was developed in 2006. In accordance with feedback provided by members as well as emerging needs, ERM was revised and new modules added such as export of the data into Microsoft Excel, back-up of the data in the system, access of users to the data based on their authorization, new types of reports, improved visual quality and user manuals, which were integrated into the system in 2009.

Modularity, simplicity, meeting basic requirements, ease of use and ease of improvement, along with other features that commonly exist in international systems, are basic features of the ANKOS ERM system. Within this context, development of new functionalities are to follow in modules of Databases, Members, Subscriptions, Firms,

System Users, Settings, Alerting, Static Reports and Dynamic Reports. For example, the use of COUNTER-defined fields in the database allow for the entry of usage statistics. ERM Initiative documents by the Digital Library Federation (DLF) and members' feedbacks define the context of the system updates.

All planning and documentation of the ERM system was undertaken jointly by the ANKOS Statistics Group, IT Staff in University Libraries and ANKOS management team. On the other hand, programming was entirely outsourced. Systems tests and controls were conducted by the IT staff and Statistics Group. Since most modules were set up and data were entered by the Statistics Group, which was also actively involved in the planning phase, no significant problems were confronted in this stage. Following the preparation of training materials by the Statistics Group and the completion of the training workshop, the system was begun to be used actively.

The success of the deployment phase (in terms of short duration and low number of bugs) is mostly due to the fact that the system was modular and could operate independent of the library automation systems, designed to address existing needs and that Statistics Group, which manages and uses the system, was directly involved in the development phase. The system continues to be updated based on user feedback and technological developments.

The structure of the ERM is based on 40 tables which interrelate the ANKOS databases, members, subscriptions, companies, users, system settings, static reports and dynamic reports. ERM was coded in PHP programming language on MySQL. Both the visual and the functional interface of the system were designed in AJAX. Furthermore, when the system was designed, the essential infrastructure for obtaining data was enabled according to the COUNTER initiative and SUSHI Protocol, which are the basic statistics standards in this field.

One of the most important innovations in the ANKOS ERM system is the introduction of access rights. The system users are allowed to use the data within the scope of their access rights. Table 1 shows the modules and the allocation of access rights within the ANKOS ERM system.

The Statistics Group is responsible for the operation of the system and is the administrator. Database Liaisons have rights for both

Table 1
ANKOS ERM system: modules, users and access rights.

Modules		Statistics group	Steering committee	Negotiating group on databases	Database liaisons	Research groups	Working groups	Library directors	Member liaisons
Databases	View	x	x	x	x	x	x		
	Add	x							
	Modify	x	x		x				
	Delete	x							
Members	View	x	x	x	x	x	x		
	Add	x							
	Modify	x	x						
	Delete	x							
Subscriptions	Add	x			x				
	Modify	x			x				
Firms	View	x	x		x				
	Add	x							
	Modify	x			x				
System users	List	x	x	x	x	x	x		
	Modify	x							
Settings	System settings	x							
Alerting	Process logs	x							
Static reports	View	x	x	x	x	x	x	x	x
Dynamic Reports	Users	x							
	Firms	x							
	Subscriptions	x							
	Databases	x							
	Members	x							

entering and editing the data. Only, the members, represented by the library directors, as well as the Member Liaisons, i.e. the librarians working in the periodicals section of the member libraries, can access the reports. The system can be logged on to by entering the user name and password. Due to the confidentiality of the data available in ERM, the system can be logged on to only after accepting the terms and conditions for using and sharing the data.

DATA ENTRY AND REPORTING IN THE ANKOS ERM SYSTEM

The data are entered into the ERM System annually by Statistics Group members and Database Liaisons. The duties of the Statistics Group consist of updating information on the members and Full-Time Equivalent (FTE) student and staff numbers, registration of the system users and their access rights, creating new database records in the system as well as deactivating the databases for which the consortium agreements have terminated and appointing the Database Liaisons responsible for the database. The Statistics Group members also collect the information about ANKOS members' FTE numbers from the Student Selection and Placement Center (ÖSYM, 2011), the Council of Higher Education (YOK) web sites and libraries.

Database Liaisons enter and update the information related to the databases in the system, such as details of content and subscriptions, usage, costs, problems, suggestions, training sessions, seminars and user manuals. Usage statistics in the system cover only the databases subscribed to through the consortium. Database Liaisons acquire and enter the usage statistics of these databases obtained from publishers at the end of each year. The ERM System is exclusively for ANKOS members, who are required to enter their user names and passwords to access the system. The data are only to be used by the members of ANKOS, and no problems of unauthorized sharing of the information with publishers have been encountered.

Statistics are checked by the Statistics Group members after data entry by a Database Liaison. If any inaccuracy is suspected, the Database Liaison is asked to obtain further information from the publishing company in order to correct the usage statistics. Some publishers do not provide usage statistics on time, and this type of problem is referred by the Database Liaison to the ANKOS Steering Committee to find a solution.

With the information provided by ERM, various analyses have been possible such as database usage in Turkey at the macro level, total members, and total amounts paid. These data enable ANKOS and university libraries to make more efficient strategic plans. Thanks to these data, academics are also able to draw conclusions which will be useful for other researchers and library consortia.

After entering the data into the system, two types of reports can be obtained: static reports and dynamic reports. Static reports are created by the system automatically and are the most requested type. They cover such things as the number of ANKOS members, members' FTE numbers, and number of institutions which are subscribers of a database, average database subscriptions, and reports of database user cost analyses.

Dynamic reports are prepared by Statistics Group members to show year, database, costs, members, firms, etc. and are more detailed than static reports. For example, with one of these reports, total amounts to be paid for databases subscribed through ANKOS can be calculated instantaneously in a single currency (USD, Euro, TL...) through that module of the system.

ERM System reports guide the creation of the ANKOS strategic plan and allow the members to obtain information about the databases they subscribe to through the consortium. Reports received from the system can also be made available to academics studying the use of electronic resources. In the next section, ERM reports on the number of ANKOS members, FTE numbers of members, database subscriptions and database usage statistics are provided to illustrate the benefits reaped from the new ERM system.

Table 2

Number of members of ANKOS, subscribed databases and total subscriptions by year. Source: ANKOS (2010d).

Year	Members	Subscribed databases	Total subscriptions
2000	12	5	45
2001	39	9	129
2002	58	15	235
2003	78	24	402
2004	80	30	565
2005	82	34	723
2006	86	38	841
2007	86	45	992
2008	90	47	909
2009	109	65	1,293
2010	120	81	1,628

SAMPLE REPORTS GENERATED BY THE ERM SYSTEM

Report on Number of ANKOS Members, Subscribed Databases and Total Subscriptions

Data on the number of members of ANKOS, the databases for which license agreements have been concluded, and data on the members which can be obtained from the ANKOS ERM System are presented in Table 2.

As shown in Table 2, the number of members of ANKOS and the number of subscribed databases increased regularly year after year. The total number of subscriptions decreased in 2008 because some of the databases began to be accessed via the National Electronic Resources Academic Licence (EKUAL) (TÜBİTAK-ULAKBİM, 2010a). The databases of EBSCO (56 members), Taylor & Francis (50 members), Ovid (43 members) and BMJ (6 members), which had been included in the ANKOS consortium, became accessible through EKUAL (Istatistik Grubu, 2008). There was again a rapid increase in the number of license agreements and total subscriptions in 2009. This was due to increased participation in existing database agreements and also to new agreements. For example, the American Society of Mechanical Engineers (ASME) Digital Library (15 members) and the Society of Photographic Instrumentation Engineers (SPIE) Digital Library (5) were added to the ANKOS Consortium.

Report of the Universities and ANKOS Members

It is essential to reach information on consortium members rapidly and use the communication channels efficiently, so ANKOS monitors the members' information through the Council of Higher Education web site and keeps the current information in the ERM system.

According to ANKOS ERM system data, in 2010 there were 167 universities in Turkey and 120 were members of ANKOS. The number of universities in Turkey and the ANKOS member institutions are presented in Fig. 2.

As depicted in Fig. 2, the number of foundation universities,³ which was 30 in 2008, rose to 65 in 2010, which is an increase of 116%. The number of state universities, which was 85 in 2008, rose to 102 in 2010 which amounts to an increase of 20%. Correspondingly, the number of ANKOS members rose to 120 in 2010 from 82 in 2005.

³ Public universities and foundation universities are the two types of universities in Turkey. All expenses of public universities are financed by the allocated government resources. Foundation universities are higher education institutions, which are public legal entities by law, that can only use their revenues in order to promote themselves or their organizations and institutions. Foundation universities' revenues consist of foundations' contributions, tuition fees and government aids (The Higher Education Council of Turkey, 2012).

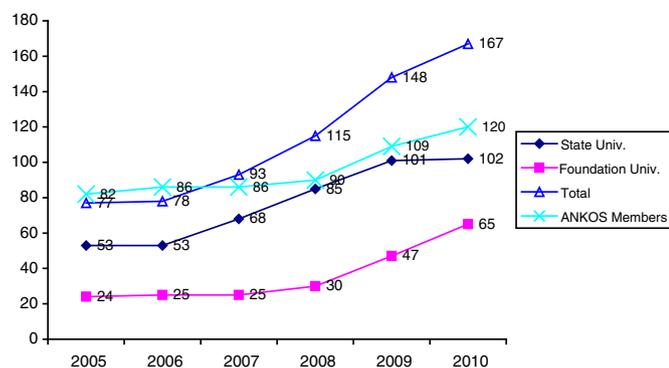


Fig. 2. Number of higher education institutions in Turkey by year and ANKOS members.

Report of Full-Time Equivalent (FTE) Numbers and ANKOS Members

The number of articles used in databases, the total amount paid for database and the number of total FTE, which refers to faculty members, undergraduate and graduate students, are taken as the base criteria to determine the cost of databases to subscribing institutions. Publishers have the information on total number of articles used and amounts paid, but not the FTE information. Therefore, publishers require the number of members in the FTE ranges. These data, which can be provided from the ANKOS ERM system, are presented in Table 3.

As shown in Table 3, the number of universities which have between 1 and 5000 FTE has increased since 2007, whereas the number of universities which have between 40,000 and 70,000 FTE has decreased. The reason behind the significant increase in the number of universities is that the large universities have been split and new universities have been founded in connection with the government's policy to increase the number of universities and open new ones in many regions of the country.

Report of Databases Subscribed to within the Scope of ANKOS

One of the reports which can be obtained from the ANKOS ERM System is the number of databases to which the institutions subscribe. Table 4 presents the number of databases subscribed to by the universities in Turkey through the ANKOS consortium.

As shown in Table 4, the number of databases to which the institutions subscribe is increasing. For instance, while the number of institutions that subscribed to 29–45 databases in 2009 within the scope of ANKOS was 7, that number rose to 12 in 2010. The number of universities that subscribed to 16–20 databases in 2003 within the scope of ANKOS was 3, whereas that number increased to 19 by 2009.

Usage of Databases Subscribed to within the Scope of ANKOS

Parallel to the increase in the number of members of ANKOS, the number of database subscriptions also increased. Therefore, one of the most important reports is the one that indicates whether such databases are used effectively or not. Data on the number of full text articles

Table 3
University FTE bands (2007–2010).

FTE	Universities (2007)	Universities (2008)	Universities (2009)	Universities (2010)
1–5,000	29	29	48	59
5,001–10,000	15	18	18	18
10,001–20,000	23	26	26	26
20,001–30,000	11	10	10	10
30,001–40,000	3	4	4	4
40,001–70,000	5	3	3	3

Table 4
Number of subscriptions of the universities by year.

Number of databases	2003	2004	2005	2006	2007	2008	2009	2010
1–5	45	39	33	30	21	26	38	44
6–10	18	20	19	25	22	23	17	17
11–15	12	11	17	14	24	19	18	12
16–20	3	9	8	12	8	15	19	19
21–25	0	1	5	3	7	2	7	12
26–28	0	0	0	2	1	4	3	4
29–45	0	0	0	0	3	1	7	12

downloaded, searches and pages viewed can be obtained from the ERM system. Table 5 indicates the use of the databases in ANKOS, number of members and subscriptions (Cukadar, 2010) through ANKOS between 2001 and 2009.

Databases can be grouped into three categories: bibliographic, full text and electronic books. The number of articles accessed from the full text databases, the number of searches made in the bibliographic databases, and the number of pages viewed or the number of book chapters downloaded for the electronic books are taken as the basis for the assessment.

The reason for the decline in the statistics for full-text use in 2008 is the transfer of the EBSCO, Taylor & Francis, Ovid, BMJ databases from ANKOS to the EKUAL license agreement, as mentioned earlier. A regular increase is observed in the usage of the bibliographic databases.

Increase of database usage also contributed to the rise of academic publishing from Turkey. The increase in the number of articles from Turkey cited in the ISI-Web of Science (TÜBİTAK-ULAKBİM, 2010b) reflects this, as shown in Table 6.

The number of publications from Turkey listed in the ISI-Web of Science in 2001 was 8,378 whereas that number increased to 27,203 in 2009.

THE IMPACT OF THE ERM SYSTEM ON STRATEGIC PLANNING

Database usage statistics are very important for consortia and libraries to make correct decisions. The consortium achieves better management of negotiations with publishers/vendors when in possession of database usage statistics. In addition, data on usage statistics are very important to make a decision for renewal or cancellation of a database subscription and also whether user training is needed or not. Furthermore, libraries need the statistical data for budgeting and budget analysis, marketing etc. The benefits of the ERM system to the members are outlined below.

Statistical Data in Budgeting

As emphasized in the study by Angela Conyers (2006), statistical data should be used by libraries in finding answers to questions such as “what do the usage statistics show with respect to return on the remuneration paid and adjusting the expenditures of the library? What is the balance between the expenditure and usage, in different subject areas?” The ANKOS ERM System allows the members to obtain figures such as amounts paid for a database per year, articles downloaded per user, searches and viewings in graphics and tables. In this way, the members can use such data for budgeting and analyzing the budgets of the libraries.

Statistical Data in Deciding to Renew the Database Subscription

The information on the universities, users and databases is regularly entered into the ANKOS ERM System. Within the scope of the numerical calculations made by the system, the usage of databases, the amount paid for the database and the average cost of the database for each university can be determined. Within this context, if the cost

Table 5
Usage of ANKOS databases, number of members and subscriptions.

Years	2001	2002	2003	2004	2005	2006	2007	2008	2009
Full-text	1,402,490	2,263,851	5,686,213	8,246,653	9,542,763	10,483,372	12,191,096	11,207,856	11,226,879
Bibliographic	–	–	–	–	–	–	1,947,528	2,156,029	3,902,812
Members	39	58	78	80	82	86	86	90	109
Databases	9	15	24	30	34	38	45	47	65

of an article accessed through the database is lower than the cost for the same article obtained through interlibrary loan, the database subscription can be renewed; however, if the unit cost of the article used is above \$10.00, it is necessary to review the renewal of the database subscription. Universities may train their users in order to increase the usage of databases with high unit costs. Detailed cost analysis can be made on the usage of journals and books from the database. If an article's unit cost for three years is higher than \$10.00 instead of the renewal of the database subscription, the pay-per-view method is recommended. For instance, the price for obtaining an article from Wiley Online Library ranges between \$12.25 and \$33.25 (Wiley, 2011); the cost of obtaining an article from Sage Online Journals, depending on the subject of the journals and year of publication (Sage, 2011a, 2011b), ranges between \$25.00 and \$32.00.

Statistical Data in Benchmarking Studies

ANKOS Statistics Group members undertake to obtain useful results by comparative studies. In addition to the general FTE, the subject-relevant FTE numbers of the universities (law, medicine, engineering, etc.) were also included in the system in 2010. Providing that the database is a specific one, the system creates reports taking into account the number of the relevant FTE, the amount paid for the database and the usage statistics. Furthermore, it is now possible to compare similar types of universities among themselves.

Statistical Data in Promoting the Libraries

e-Resources rapidly increase in line with developing technology and they form an important part in the promotion of libraries. It is easier to measure the usage of e-resources compared to print resources. Within this context, libraries can use the statistical data for the databases that they subscribe to through ANKOS for their promotional activities. They can organize training seminars for the databases which are used less. Such practices will increase the visibility of the libraries.

Statistical Data in User Education

Statistical data are required for planning user education programs. As mentioned in the article by Conyers (2006), usage statistics of the databases are needed in order to answer the questions: "Are there any resources which are not being used as expected? Is it necessary to focus more on promotion? What are the most popular ways of accessing? (Google, Google Scholar, directly from publishing houses, A-Z library pages, over the library catalog, link resolvers, etc.)". There is a section in the ANKOS ERM System where the problems, suggestions and user education conducted with respect to each database can be detailed. These data and information contribute to the planning of the user education program.

Table 6
Total number of publications from Turkey cited in the ISI-Web of Science.

Years	2001	2002	2003	2004	2005	2006	2007	2008	2009
Articles	8,378	10,806	13,151	16,231	17,412	20,013	23,983	24,586	27,203

CONCLUSION AND ASSESSMENT

Statistical data are very important in managing and evaluating electronic information resources. Libraries need the usage statistics for topics such as budgeting, renewal of database subscriptions, collection development, and increasing user education. Library consortia also need statistics in order to develop strategic plans, to negotiate with database providers, and to obtain information about their members.

Within this scope, the ANKOS Electronic Resources Management System ensures that

- Data are entered into the system and assessed in line with international standards (COUNTER, SUSHI),
- The information on the subscribed databases is collected, edited, updated and shared with the members,
- The databases which do not provide statistical data are clearly identified,
- Detailed data on the member institutions are obtained,
- The performance of ANKOS and its employees is measured,
- The growth rates of the consortium and the data within the scope of the consortium are kept electronically as an archive.

ANKOS ERM System differs from similar ERM systems:

- Free-of-charge managerial reporting on e-resources for all 120 members of ANKOS
- Platform-independent, web-based application
- High data security and privacy due to the fact that all data is recorded on ANKOS servers
- Turkish interface
- Turkish support for development
- The system is exclusively used for managing administrative data

This system, which was developed in parallel with technological developments and new requirements, is continuously updated. The developments in the ERM systems of other consortia are followed in order to develop the system and facilitate its international compatibility. While consortia with similar ERM needs can use ANKOS ERM structure and ANKOS experience for development, translation of system's modules into English will also allow for quicker adaptation.

The system contributes to ANKOS and its member institutions for strategic planning by facilitating budgeting for libraries, measuring usage of e-resources, and cost analysis of electronic resources. One major area of development is the automatic integration of publishers' monthly statistics.

All in all, ANKOS ERM in Turkey presents a best practice example of ERM development under cost considerations and offers valuable insights for consortia managers, librarians and scholars working on ERM systems. Besides highlighting of critical success factors for the design of consortium-level ERM systems, statistical facts provided in this study, i.e. number of universities, FTE band widths, number of

database subscriptions and total number of citations, will be valuable information for academics doing research on this subject, publishers and vendors.

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