

Adjusting the library performance standards for consortia services: A case study

Abstract

Purpose – This study proposes a framework for performance measurement of library consortia services by implementing the indicators listed in ISO 11620. The framework is validated by using real data from HEAL-Link, the national consortium of Greek academic and research libraries to calculate the indicators.

Design/methodology/approach – The paper reports on the related work regarding the services consortia offer to their members and the known methods and tools for assessing consortia services; the HEAL-Link case study, the aggregation and handling of data, is presented; ISO 11620 performance indicators for HEAL-Link services are calculated and the results are discussed in terms of what we have learned about the consortium, about measuring consortia services performance, and about the standard.

Findings – ISO 11620 could be used to measure performance for assessing consortia services. The performance indicators' results reflect the two major events (mergers and COVID pandemic) that took place during the time of the study. ISO 11620 offers a basic insight that could be well complemented with other tools and standards.

Originality/value – The current study suggests that a widely accepted, easily applied, benchmarking ISO standard could be used to measure common consortia services' performance, thus contributing to consortia assessment.

Keywords: Library standards, library consortia, performance measurement, performance indicators, library consortia assessment.

Paper type: Research Paper.

1. Introduction

Library consortia are silent partners in the everyday library business. Whether we access digital content, deliver a physical document from another library, or type key-words in a shared library system (ILS), we often use the results of the partnership, rather than contemplate the underlying structure. Nowadays, well over a century from the first library cooperative programmes (Weber, 1976), libraries find themselves amid a complex social, economic, and technological reality that they could not address if left to their own resources.

Therefore, since the need for cooperation between libraries is imperative, the need for assessing partnership is also essential for examining the degree of satisfaction of its goals, as well as its efficiency. So far, the suggested ways to evaluate library consortia include: following the LibQUAL+ survey to understand users' opinions on consortia services (Gatten, 2004);

assessing digital material services (Plum *et al.*, 2010); estimating the economic value of a consortium (Melo and Pires, 2011; Machovec, 2015).

These methods and tools evaluate a single aspect of consortium operation, which implies that they share a narrow focus and a deeper understanding of the specific facet under observation. On the other hand, a general framework that measures performance or benchmark for several library consortia services at once has not yet been proposed.

This study proposes the performance measurement of consortia by implementing the indicators included in ISO 11620 (International Organization for Standardization, 2014). Although the standard concerns individual library performance, we aim to investigate whether it offers a wide scope across several aspects of consortia operation.

Applying an ISO standard demonstrates several advantages: it is a widely-accepted, well-structured, easily applied, benchmarking framework. Furthermore, libraries have been implementing this particular ISO standard to assess their own performance since its first edition in 1998 (Harnesk, 1997; O'Farrell, 1998). Using ISO 11620 for library consortia assessment could either assist in the self-assessment of a consortium or form a concrete basis for comparison between different consortia, both of which are valuable practices.

The current study, by calculating specific ISO 11620 performance indicators (PIs) with real-world data from HEAL-Link [1], the national consortium of Greek academic and research libraries, complements a previous work (Gonda and Papatheodorou, 2021), where the hypothesis that ISO 11620 could be used for cumulative assessment was presented. We attempt to build on that, by answering the following research questions:

1. Can we validate by using real data from a consortium that ISO 11620, a standard created for use by libraries, could be applied to the consortia environment?
2. Can ISO 11620 measure the performance of consortia services and furthermore, of the most common ones?
3. How can we interpret the results of each PI and what do they indicate for the consortium? What "story" do the results of the PIs tell us about the consortium's performance in specific services?

The next sections of this study are organised as follows: section 2 focuses on the related work regarding the services consortia offer to their members, the methods and tools for assessing consortia services, and other studies that discuss ISO11620; section 3 refers to HEAL-Link case study; section 4 about the methodology applied demonstrates the ISO 11620 PIs, the data we gathered and how we handled them; section 5 presents the results from calculating the standard's performance indicators for HEAL-Link services; section 6 discusses our findings, while section 7 summarizes the main conclusions and limitations of this work.

2. Related work

2.1 Library consortia services

We often think of consortia as unmoving, but that is just a false impression; the consortia landscape has changed considerably throughout the last century. From the first partnerships formed in the 1930s (such as the Cooperating Libraries of Upper New York, or the Triangle Research Libraries Network), the history of library consortia is well documented (Weber,

1976; Kopp, 1998; Alexander, 1999; Bostick, 2001). The changes, their increasing influence, their crisis, and their survival are also recorded (Mackenzie, Penniman, and Woodsworth, 2013; Scepanski and Wells, 2015).

Modern consortia offer resource sharing of print collections via InterLibrary Loan, and/or e-content through licensing and 'big deals'; they provide shared print storage, and/or digital repositories; they share staff expertise and human resources by enabling communication between libraries, and/or by organising training programmes; they build new infrastructure, new services, or import new technology. Three major surveys conducted between 2006 and 2015 (Davis, 2006, 2009; OCLC, 2012; Horton and Provenitz, 2015) and previous studies (Dong and Zou, 2009; Machovec, 2013) focused on listing the most common consortia services; Gonda and Papatheodorou (2021) summarize these findings as follows:

- **Collaborative Collection Development:** the coordination of libraries for their collection development is a self-evident activity for consortia. As an umbrella term, it includes cooperative purchasing of print material, electronic content licensing, and shared storage facilities of print collections.
- **Consortium Management:** the term might seem to refer more to an in-house operation than to a service offered to the participating libraries, but it includes the management of shared human resources, assistance in library assessment, collective budgeting and financial management, and lobbying and public relations.
- **Cooperative Digitization Services:** many consortia engage in digitization initiatives, building digital libraries and developing union catalogs, thus preserving special, rare collections or archives.
- **Institutional Repositories:** the software and hardware infrastructure for collecting the intellectual output of a research institution is primarily an activity for academic library consortia.
- **Programmes for Users:** several consortia organise summer reading campaigns, offer seniors' technology education or STEM programmes and exhibitions.
- **Resource Sharing and InterLibrary Loan:** one of the pillars of library cooperation, the sharing of print materials and more recently, of e-content; the term could refer to physical delivery services, loaning from library to library, document delivery, and licensing that allows the distribution of digital material.
- **Shared Integrated Library System and Collaborative Cataloguing:** collaboration between libraries started with the sharing of bibliographic records and naturally progressed to include union catalogues and shared systems.
- **Staff Training and Consulting:** the consortium may provide or facilitate the sharing of personnel that includes specialists in specific areas, consultants, trainers and event organisers. It is a common practice for the consortium to organise train-the-trainer sessions, or programme trainings for the libraries' staff, especially for use of tools provided by the consortium.

2.2. Methods and tools for assessing consortia services

Several notable paradigms of assessment for libraries have been transferred to consortia environment, such as LibQUAL+ and MINES for Libraries. LibQUAL+, the well-known, widely used, web-based survey for libraries supported by ARL (the American Association of Research

Libraries) offers the option to add a set of five questions when applied on a consortia basis. In addition, a group report and the ability to benchmark results with a group of peer institutions are also available [2]. About 40 consortia and other library groups are listed on LibQUAL+'s website and several studies have been published to elaborate on the experience of using LibQUAL+ for consortia (Gatten, 2004; Lee, 2004; Garthwait and Richardson, 2008). LibQUAL+ could be used to gain perspective on end users' opinions about consortia services, but five questions seem hardly enough to assess the wide range of consortia services. In comparison to ISO 11620, LibQUAL+, being a user satisfaction survey, could be integrated with the PI B.2.4.2 'User Satisfaction'.

For reporting on usage statistics for electronic resources, libraries and consortia have been receiving vendor-supplied data through COUNTER (Counting Online Usage of Networked Electronic Resources), the international standard, which is currently in its fifth edition. On the other hand, MINES for Libraries (Measuring the Impact of Networked Electronic Services), a protocol supported by ARL, provides information on user demographics and purpose of use. The protocol "deepens the institutional understanding of COUNTER/SUSHI data, addresses some of the weaknesses of web-based survey" and is being applied by consortia, as summarized by Plum *et al.* (2010). COUNTER and any tool handling statistical data for digital content can inform a consortium's decisions around 'big deals' and cooperative purchasing, and therefore are irreplaceable for assessing a consortium's performance for these services. Such data, as outlined in sections 4 and 5, are also useful in calculating several ISO 11620 PIs, e.g. B.1.1.3 'Percentage of Rejected Accesses' or B.2.1.4 'Number of Content Units Downloaded per Capita'. Though ISO 11620 has a use for data referring to digital content (see section 4 for a detailed description of relevant indicators), as a general framework, it does not focus on these, as is the case with COUNTER/SUSHI data.

A promising tool is CC-PLUS (Consortia Collaborating on a Platform for Library Usage Statistics), a project funded by IMLS (the American Institute of Museum and Library Services) to develop an open-source application that harvests and manages COUNTER data from publishers (Mald *et al.*, 2018). CC-PLUS is not the sole tool being developed by the consortia community to handle statistical data; other projects include the usage statistics portal for member libraries of the Digital Resource Acquisition Alliance of Chinese Academic Libraries (Ye, Yang, and Lin, 2018) and CELUS by CzechELib (CzechELib, 2022). Tools that handle statistical data are not in contrast with ISO 11620, since, if desired, they could be configured to calculate relevant PIs for the standard.

Determining the economic value of a consortium is another important angle consortia take into consideration when reporting back to their members. Melo and Pires (2011) estimated a consortium's value based on the users' 'willingness to pay' for the consortium services; while ISO 11620 uses a method based on a similar concept, the 'Willingness to Return' (PI B.2.4.3) to assess the effectiveness of the library's reference service, it is safe to say that the method 'Willingness to Pay' compliments the standard, adding one more arrow to the consortia's quiver.

On the other hand, Machovec (2015) elaborates on Cost-Benefit Analysis (CBA) / Return on Investment (ROI) models as a way to determine a consortium's value per service; his study summarises the different ways consortia calculate CBA/ROI in services such as electronic resource licensing, union catalogues and sharing resources, shared print management programmes, digital repository services, and staff training. In comparison to this, ISO 11620 includes several PIs that provide an insight into the relation between benefits (as offerings to

users) and costs, such as *B.3.1.1 'Cost per Collection Use'* or the general efficiency, such as *B.3.4.1 'Cost per User'*. In our opinion, CBA/ROI and all the other tools and methods mentioned before could be used alongside ISO 11620, complimenting the framework with thorough insights into several different aspects of managing consortia.

2.3. Studies that implement ISO 11620

If all methods for assessing value or performance have their own merits, so does applying performance indicators (PIs). As ISO 11620 states, PIs are a “numerical, symbolic, or verbal expression derived from library statistics and data used to characterize the performance of a library” (International Organization for Standardization, 2014, p. 5). The standard, currently in its third edition, presents 52 performance indicators, categorised under four main areas of measurement, following the Balanced Scorecard approach. These areas are:

- 1) Resources, Access, and Infrastructure,
- 2) Use,
- 3) Efficiency, and
- 4) Potentials and Development.

For each area, the categorisation of PIs into five service/resource facets is applied: Collection, Access, Facilities, Staff, and General. Every indicator is given a unique alphanumeric code representing the categorisation, along with a unique descriptive name. For example, for indicator *'Required Titles Availability'* (name of indicator) the code *B.1.1.1* denotes that it is the first of the *Resources, Access, and Infrastructure* area, referring to the facet *Collection*.

ISO 11620 has already been applied extensively to measure the performance of individual academic libraries and public libraries worldwide. The standard's influence is reflected in the European comparative study on key performance indicators in academic libraries conducted by the French Academic Libraries Directors' Association (ADBU), where one of the criteria for an indicator to be included in the corpus of common indicators, was to be enlisted in the ISO 11620 (Swiatek, 2019). Similarly, a study mapped ARL members' assessment data to ISO 11620 PIs (Passonneau, 2013). The ISO standard has been used as a reference tool to compare the performance between public libraries across different countries (Pateman, 2011). An earlier study developed a model using the 1998 edition of ISO 11620 PIs for benchmarking purposes between academic libraries; their model defines a set of criteria (customer satisfaction, impact on society, leadership, and financial perspective) and the weight of each criterion or indicator as the outcome of the performance assessment process (Melo and Pires, 2008). Gonda and Papatheodorou (2021) confirmed that ISO 11620 PIs can measure the performance of the most common services consortia offer to their members: 46 out of 52 performance indicators could be applied for assessing a consortium service or the general impact of the consortium.

As Sputore and Fitzgibbons (2017) conclude, ISO 11620 enables libraries to communicate their performance “in an internationally-validated, professionally-robust form”, since the calculation of PIs is applicable in “reporting to senior management, in narratives for marketing, and in setting continuous improvement targets”. These merits we believe are transferable to the consortia environment, thus instituting ISO 11620 as a framework that can assess a consortium's performance across several services.

3 The HEAL-Link case study

HEAL-Link (Hellenic Academic Libraries Link) was founded in 1998 (Kohl and Dervos, 1999) with the main purpose to negotiate with editors and vendors for e-journal licensing. Since then, the consortium has expanded its services to include: a shared catalogue and ILS (Integrated Library System), three different Interlibrary Loan (ILL) networks, support of institutional repositories and a shared data repository ('HARDMIN' [3]), publishing of open access academic textbooks, various training activities, and scholarly communications services [4]. The complete list of the consortium's members covers all the Greek academic libraries, most of the country's research/specialised libraries, and the National Library of Greece [5].

Comparing HEAL-Link services to common consortia services (as presented in section 2.1), we easily deduce that HEAL-Link engages with most of these services. In detail, the Greek consortium offers:

- (1) Electronic Content Licensing,
- (2) Institutional Repositories,
- (3) Programmes for Users,
- (4) Resource Sharing and InterLibrary Loan,
- (5) Shared ILS and Collaborative Cataloguing,
- (6) Staff Training and Consulting, and
- (7) Consortium Management.

HEAL-Link does not extend its services to Cooperative Purchasing of printed materials, Shared Print Storage, or Digitization Services. Table I compares HEAL-Link services with the above-mentioned common consortia services.

Table I: Comparison of common consortia services to HEAL-Link services (table by authors)

The extent of the offered services and HEAL-Link's willingness to provide us with the necessary data were the main reasons for the selection of this particular consortium for our study.

Our initial intention was to evaluate the performance of the seven categories of services offered over the period 2018-2020 as mentioned above. However, assessing cataloguing is a difficult task in a single library's environment, let alone **Collaborative Cataloguing** in the more complex and extensive environment of a consortium. So, in theory, we would be able to assess how collaborative cataloguing has an impact on e.g. the 'Percentage of Rare Materials Accessible via Web Catalogues' (PI B.1.2.6) or the increase –hopefully– in 'Employee Productivity in Media Processing' (PI B.3.3.4), but the data required for the calculation of the appropriate indicators are not supported by the Shared ILS or any HEAL-Link agency.

Though HEAL-Link has provided D-Space software for **Institutional Repositories** and application guidance for several Greek Universities, the responsibility for archiving each institution's publications lies with their academic library. Thus, there is no point in assessing the consortium's performance for this service. Although HEAL-Link has also been developing a national repository for research data ('HARDMIN'), it is still in a pilot phase, therefore it is too early to assess the performance of this service. Consequently, we did not obtain any data for Institutional Repositories.

The boundaries between **User Programmes** and **Staff Training** in a consortia environment are rather unclear. We distinguished ‘Programmes for Users’ as events and training for library end-users; ‘Staff Training’ was defined as training for the librarians (of any member library), noting that the term could also include training for the consortium personnel. HEAL-Link in recent years has organised several webinars for Greek researchers and has offered training for librarians through different agencies within the consortium. However, the data concerning the *Number of Attendances* (PIs *B.2.2.4* and *B.2.2.5*) or the *Number of Attendance Hours* (PI *B.4.4.2*) are not accumulated by an appointed agent within the consortium, therefore we could not confirm the collection of accurate and complete data.

Nonetheless, we accumulated data to calculate the PIs for three of the offered services: Consortium Management, Cooperative Electronic Content Licensing, and Resource Sharing and InterLibrary Loan.

4 Methodology

4.1 Consortium Management

Consortium Management is more a function than a service. Since the ISO 11620 enlists several PIs that could be applied for assessing a consortium’s performance in administration, and since it is “one of the most major functions of consortia” (Horton and Provenitz, 2015, p. 56), we decided to include Consortium Management in our study.

Seven PIs correspond to measuring performance of consortium management: *B.3.4.1 ‘Cost per User’* can be used to measure the general efficiency of the consortium; *B.4.3.1 ‘Percentage of Library Means Received by Special Grant or Income Generated’* and *B.4.3.2 ‘Percentage of Institutional Means Allocated to the Library’* are meant to assess the library’s funding, or rather the consortium’s in this instance; and four more indicators, *B.1.4.1 ‘Staff per Capita’*, *B.3.3.1 ‘User Services Staff as a Percentage of Total Staff’*, *B.4.2.1 ‘Percentage of Library Staff Providing Electronic Services’*, and *B.4.2.4 ‘Percentage of Staff in Cooperative Partnerships and Projects’*, are assigned to assess the management of human resources.

Data used for assessing Consortium Management were collected from several sources. Financial data were gathered from the consortium’s *E-resource Access Service*, from HEAL-Link’s annual reports to its members, and from *Diavgeia* [7], a government portal, where all government acts and decisions are mandatorily uploaded. Several data are displayed on HEAL-Link’s website, such as a list of members, the services provided, and the personnel assigned to each service. Data regarding the total number of end-users and the total number of library staff in Greek academic libraries, were also gathered from the annual reports published by the *Quality Assurance Unit of Academic Libraries* [8].

4.1.1. Assessing the efficiency of the consortium

The PI *B.3.4.1 ‘Cost per User’* can be used to assess the cost-effectiveness of a consortium over time or in comparison with other consortia, given that the accounting methods applied are the same. The indicator is calculated when the total recurrent or operating expenditure of the library (or consortium in this case) in a financial year is divided by the number of users. We applied two different versions of end-users: the cumulative population of the academic institutions, or the cumulative number of registered users of each academic library.

4.1.2. *Assessing the funding of the consortium*

HEAL-Link receives funding from two sources: its members and the Greek Ministry of Education [9]. We were able to gather the necessary data to calculate the two indicators associated with funding.

The first PI, *B.4.3.1 'Percentage of Library Means Received by Special Grant or Income Generated'*, is the percentage of the library –or, in this instance, the consortium- means received by special grants or income generated divided by the overall means and multiplied by 100, as is stated in the standard. -Its objective is “to assess the library’s success in obtaining additional financial resources” (International Organization for Standardization, 2014, p. 96). In this case, we applied the indicator to determine the balance between the two sources of funding: the standard membership fees and the additional funding from the Ministry.

The second indicator, *B.4.3.2 'Percentage of Institutional Means Allocated to the Library'*, is calculated when we divide the library means by the institutional means and multiply by 100. As library means, we refer to the consortium’s budget; since this PI’s objective is to measure the importance and the support of the funding institutions for the consortium expressed in monetary units, it makes more sense that the consortium will want to calculate the indicator without the additional funding of the Ministry. As institutional means, we used the cumulative budget of the library-members.

4.1.3. *Assessing the human resources of the consortium*

These next four -indicators have been assigned to assess the management of human resources. We decided to take into consideration only the personnel paid by HEAL-Link and to exclude any staff that belong to the members, but have been assigned –either part-time or full-time- to work for the consortium.

The first relevant PI, *B.1.4.1 'Staff per Capita'*, is the number of employees in full-time equivalent (FTE) divided by the number of persons in the population to be served and multiplied by 1.000. For our application of this indicator, we used the number of cumulative population of the academic institutions.

The next three indicators define how many of the employees are assigned to specific duties: user services, information technology (IT) services, and cooperative projects. The PI *B.3.3.1 'User Services Staff as a Percentage of Total Staff'*, is calculated when we divide the number of FTE employees assigned to user services by the total number of FTE employees.

Similarly, *B.4.2.1 'Percentage of Library Staff Providing Electronic Services'* is the number of library staff (in FTE) providing, maintaining, and developing IT and/or web-based services divided by the total library staff (FTE) multiplied by 100.

Last but not least, *B.4.2.4 'Percentage of Staff in Cooperative Partnerships and Projects'* is the number of library staff (FTE) planning, maintaining, and developing partnerships and projects divided by the total number of library staff (FTE) multiplied by 100. For this indicator the number of personnel paid by the consortium represents the number of library staff working for partnership projects, while the total number of library staff is represented by the number of employees in Greek academic libraries cumulatively.

4.2 *Cooperative Electronic Content Licensing*

As mentioned in section 3, HEAL-Link engages in cooperative purchasing for e-resources, arranging ‘big deals’ with publishers on behalf of the Greek academic/research institutions. In

order to calculate the PIs for **Cooperative Electronic Content Licensing** we required data from the consortium's *E-resource Access Service*, regarding the following:

- (1) the number of rejected accesses on the databases the consortium licenses per year,
- (2) the number of successful accesses on each licenced database per year, and
- (3) the total costs for subscriptions per year.

We acquired the first and the third set of data. Instead of the second set, the number of downloads was available, which we used to calculate the corresponding PIs.

There are five indicators enlisted in the ISO 11620 available for assessing performance for Cooperative Electronic Content Licensing. We classified them in two categories: (1) the ones that can be applied separately for each database the consortium purchases access to and (2) the PIs that assess the collection as a whole.

4.2.1. *Assessing each database separately*

Indicator *B.1.1.3 'Percentage of Rejected Accesses'* is the number of rejected accesses on a licensed database during a specified time period divided by the combined number of rejected and successful accesses on the database during the same time period multiplied by 100. Indicator *B.3.1.3 'Cost per Download'* is the cost during a specific period divided by the number of downloads during that period.

To calculate the first one, we used the number of downloads instead of the number of total accesses, since those data were available from the publishers and the consortium; we base this decision on the standard's definition of download, as "a successful request of a content unit from a library-provided online service or other internet service" (International Organization for Standardization, 2014, p. 3). Though we altered the data used to calculate the first indicator, in our opinion it is still applicable and offers an insight as to whether the consortium owns enough licenses to meet users' demands. The second PI depicts differences in acquisition cost between publishers and monitors the rise or decrease of acquisition cost per publisher from one year to the next according to use.

4.2.2. *Assessing the Whole Collection*

Three PIs could be applied to assess what the consortium pays for the whole collection: *B.3.1.1 'Cost per Collection Use'*, *B.3.1.2 'Acquisition Cost per Collection Use'*, and *B.3.3.3 'Ratio of Acquisition Expenditures to Staff Costs'*. The first indicator is the quotient of the division of the total recurrent expenditure for one financial year by the total number of collection use; the second is computed when the total acquisitions expenditure is divided by the same denominator the first indicator uses; and the third PI is the expenditure on acquisition divided by the staff costs.

As the standard describes, the denominator of the first and second indicator is the total number of instances of collection use (loans + downloads + in-house use). These indicators are applicable for both physical and digital collection, however, since in this case we assess digital collection only, we counted only the number of downloads (loans and in-house use are not applicable). The indicator *B.3.1.1 'Cost per Collection Use'* is using the same data and method as *B.3.1.3 'Cost per Download'* (see previous section 4.2.A), as far as electronic resources are concerned, except for the fact that the first PI can be calculated cumulatively for the entire collection, while the second refers to each resource separately.

4.3 Resource Sharing and InterLibrary Loan

HEAL-Link serves three distinct **ILL networks**:

- (1) *IRIS*: Interlibrary Loan of physical documents between the member libraries,
- (2) *HEAL-Link's Electronic Document Delivery Service*: Interlibrary Loan of electronic documents to other public services and end-users using NILDE, and
- (3) *DIADOSIS*, Interlibrary Loan of medical literature to hospitals and relevant institutions.

There are three PIs from ISO 11620 applicable to assessing this service: *B.1.2.3 'Speed of Interlibrary Lending'*, *B.1.2.4 'Percentage of Successful Interlibrary Loans'*, and *B.3.3.5 'Employee Productivity in Lending and Delivery Services'*.

We were able to accumulate sufficient data (the number of successful electronic document delivery transactions and the number of all electronic document delivery requests) to calculate the second indicator for two of the three services ('NILDE' and 'DIADOSIS' ILL networks) over the 2018-2020 period. Since we did not receive data regarding the speed of service, it is safe to assume that the consortium does not gather that kind of data. The third indicator is better suited for the environment of a library and is not transferable to the complex environment of a consortium.

5 Results

This section presents the results of calculating the ISO 11620 -performance indicators over the 2018-2020 period for the services mentioned above.

5.1 Consortium Management

We were able to accumulate the necessary data to calculate all seven PIs, though, as explained for each indicator, adjustments and decisions should be made, to transfer their application - from the library environment to the consortium environment.

Table II shows the results for the two different versions of the denominator for the PI *B.3.4.1 'Cost per User'* that measures general cost-efficiency: option A shows the cost per member of the population to be served and option B demonstrates the cost per active end-user. In option A, the results show that HEAL-Link has spent on average approximately for each member of the population to be served €12.72 for 2018, €17.01 for 2019, and €18.29 for 2020. These numbers go up when we take into account only the active library users (option B): €22.50 for 2018, €32.20 for 2019, and €30.02 for 2020.

Option A demonstrates a significant increase in cost (€4,3 per person) between 2018 and 2019 which is explained by the increase in budget. Between 2019 and 2020 another slight increase (€1,3 per person) is demonstrated which is the result of the decrease in both money spent and also the number of users. The second option gives a different impression, a sudden rise of €10 per person from 2018 to 2019 that drops almost €2 for 2020. The significant increase between the first two years is the result of the considerable rise in expenditure for 2019 and the decrease of registered users by several thousands. For 2020, the number of registered users has remained relatively the same, while the expenditure has been reduced.

Table II: Cost per User (table by authors)

Table III demonstrates the results of the two indicators concerning the **funding** of HEAL-Link over the period 2018-2020. In 2018 HEAL-Link received 97.87% of its budget from the Greek Ministry and only 2.13% from its members. For the next two years, the already small percentage of membership funding was further reduced (B.4.3.1 indicator). For the PI B.4.3.2 results, in 2018, 1.74% of members' budget was allocated to the consortium; in 2019 this percentage climbed to 4.36%, and in 2020 settled at 3.88%.

The first PI demonstrates the balance between the two sources of financing for the consortium. We easily deduce that HEAL-Link is heavily supported by the Ministry and only a small percentage (1.9% average) of its funds comes from membership fees. The second indicator refers to the percentage of the members' budget directed to the consortium. Between 2018 and 2019 the percentage is multiplied by 2.5 times and settles around 2.2 times more for the next year. A significant change, one that must be explained by the drastic budget cuts of the library-members. Indeed, while the membership fees remained relatively the same, the cumulative funding of libraries was cut in half between 2018 and 2019 as a consequence of the wave of mergers in the higher education institutes that took place at that time.

Table III: PIs for Consortium Funding (table by authors)

Table IV demonstrates the results for the four PIs concerning the **management of human resources**: B.1.4.1 'Staff per Capita', B.3.3.1 'User Services Staff as a Percentage of Total Staff', B.4.2.1 'Percentage of Library Staff Providing Electronic Services', and B.4.2.4 'Percentage of Staff in Cooperative Partnerships and Projects'.

The first -one, B.1.4.1 'Staff per Capita', demonstrates the general efficiency of the consortium in terms of serving the community. Each consortium staff member corresponds with 0.01 of the population to be served over the period 2018-2020. The fluctuation in the number of the academic community members is not conspicuous enough to affect the results for this indicator throughout the period of the study.

The following three - indicate the work placements. The results for the PI B.3.3.1 'User Services Staff as a Percentage of Total Staff' indicate that out of the eight employees paid by the consortium in 2018-2020, one is assigned to help-desk. Similarly, for B.4.2.1 'Percentage of Library Staff Providing Electronic Services' two employees are developing IT services (25%). The PI B.4.2.4 'Percentage of Staff in Cooperative Partnerships and Projects' shows a subtle fluctuation over the period of study (1.14% in 2018, a subtle rise of 1.19% in 2019, and 1.17% in 2020).

The results of all four indicators exhibit the stable personnel number and placements during the period 2018-2020.

Table IV: PIs for human resources management (table by authors)

5.2 Cooperative Electronic Content Licensing

We have calculated all five -indicators for assessing performance for Cooperative Electronic Content Licensing. Table V shows the results of the PI B.1.1.3 'Percentage of Rejected

Accesses', presented in different rows for each database, separately for e-journals and e-books, annually for 2018, 2019, and 2020. Due to legal reasons, the publishers are anonymous.

As the standard dictates, there is not much use in calculating a medium number for all databases. Comparing the percentage of denials from 2018 to 2020 we observe that HEAL-Link has succeeded in improving access to publishers' material in most cases: the percentage of rejected accesses to journals has been reduced in nine instances versus increased in four; access to e-books has been improved in four out of five publishers.

In order to assess the indicator's results, a consortium could define what is an acceptable tolerance threshold below which action must be taken. Alternatively, the consortium could continuously strive to improve access by distinguishing three groups of publishers according to demand. We could combine the two suggested practices to assess HEAL-Link's data and rank high, medium, and low demand judging on the number of downloads during 2020. To make the comparison, we applied this approach when the PI could be calculated for at least 2018 and 2020 and for e-journals only, since the number of e-book providers is low (only 5 publishers). The first group of high demand gathers four publishers with more than 500.000 downloads, the medium demand group lists five publishers with more than 100.000 downloads, leaving the third group with three publishers with less than 100.000 downloads.

In the first group, there has been a significant change in the percentage of denials between 2018 and 2020. Specifically, there is only one case in which denials to access have increased. For the group of medium demand, the results show that denials have increased in three publishers. For the last group, denials have decreased in all three publishers.

Setting a tolerance threshold should be a consortium's policy, one that could decide on a different value for each group. For example, for the group of high demand, the tolerance threshold could be the lowest figure compared to the other two groups. Due to legal reasons, no results could be announced for which or how for many publishers action should be taken to improve access.

Table V: Percentage of rejected accesses (table by authors)

The results of the PI *B.3.1.3 'Cost per Download'* are depicted in table VI in different rows for each publisher, annually for 2018, 2019, and 2020. Due to legal reasons, the publishers are anonymous. Out of the 16 publishers for which we had accumulated data for at least two years, HEAL-Link has achieved a reduction in cost for ten publishers, while there has been recorded a rise for six publishers.

The same strategy of dividing the results into three groups according to demand and setting a tolerance threshold could be applied in this indicator. We calculated the downloads of e-journals and e-books combined since acquisition cost is paid per publisher regardless of the type of material. Consequently, a different set of publishers is placed into each group. In the first group of high demand with more than 500.000 downloads four publishers are classed, and for all of them HEAL-Link has succeeded in reducing the cost per download substantially. The medium demand group with more than 100.000 downloads, lists seven publishers and the cost has risen for three, while in the third group with less than 100.000 downloads five publishers are included and the acquisition costs have increased also for three of them.

Table VI: Cost per download (table by authors)

The calculation of both PIs, *B.1.1.3 'Percentage of Rejected Accesses'* and *B.3.1.3 'Cost per Download'*, is based on the number of downloads, which has remained relatively the same between 2018 and 2019 but is displaying an acute rise for 2020 (at about 49% for journals and 39% for e-books). We can assume that this drastic change is explained by the distance learning due to the COVID pandemic, but -focused research is required to support this claim.

Table VII summarizes the results for the two -indicators (see section 4.2.2) that assess the costs for the whole collection over the period 2018-2020 and also collates the results of the PI *B.3.3.3 'Ratio of Acquisition Expenditures to Staff Costs'*. We notice that the results from the PIs *B.3.1.1 'Cost per Collection Use'* and - *B.3.1.2 'Acquisition Cost per Collection Use'* do not differ significantly; this is expected since approximately 98% of HEAL-Link's budget is spent on acquisitions. For the third indicator, *B.3.3.3 'Ratio of Acquisition Expenditures to Staff Costs'*, the personnel costs have remained the same during these three years, while the acquisition costs have risen consequentially from 2018 to 2019 and then regressed to a certain amount.

Table VII: Costs for Total Collection (table by authors)

5.3 InterLibrary Loan

Table VIII demonstrates the results for the indicator *B.1.2.4 'Percentage of Successful Interlibrary Loans'* over the period 2018-2020. For the ILL network 'NILDE' we know that there is a significant decrease in both the number of requests for loans and the successful deliveries: from 2018 to 2019 the requests drop by 50% approximately and are further reduced by another 20% in 2020, while the successful requests drop by 53% in 2019 and by 32% for the following year. These data result in a significant decrease for the PI of about 16 percentage points within the space of merely two years. For the ILL network 'DIADOSIS' there is a different set of results: from 2018 to the next year we observe a slight increase of 1.7% of successful deliveries and from 2019 to 2020 a noticeable decrease of 7.7%.

A probable explanation for the changes in the PI *B.1.2.4* would be that libraries were closed for the bigger part of 2020 due to COVID restrictions, thus resulting in the declining dynamic of both networks.

Table VIII: Percentage of Successful Interlibrary Loans (table by authors)

6 Discussion

This study proposes a framework for performance measurement of library consortia services by utilising the indicators listed in ISO 11620. The framework is validated by using real data from HEAL-Link, the national consortium of Greek academic and research libraries to calculate the indicators.

Out of the eight most common consortia services, HEAL-Link offers seven of them. We were able to measure performance for three of them, including several -PIs for the two most essential ones ('big deals' and ILL), plus all the indicators from the ISO 11620 attributed to assessing consortium management. Thus, from the 52 -indicators enlisted in the ISO 11620, we have implemented 13 - -or one-quarter of the ones included in the standard-- for those three services. What have we learned about the consortium itself? What have we learned about measuring consortia services performance? And, last but not least, what have we learned about the standard?

6.1 About HEAL-Link case study

As far as **Consortium Management** is concerned, we applied seven indicators: one - for Cost per User, two - for consortium funding, and four indicators - for human resources management. The first -one is a fundamental indication of the consortium's general efficiency: knowing how much a consortium is spending for each user-to-serve is a vital piece of information for the management of the consortium. It is also a comparable measurement over the years or for benchmarking against other consortia with certain reservations that we will address shortly (see section 6.2). For HEAL-Link, Cost per User has risen during 2018-2020 due to increase of the budget. Considering the non-profit purpose of the consortium, the results imply that HEAL-Link was able to absorb additional funds, offering extra content and supplementary services to their users.

The following two PIs gives us valuable and concise pieces of information about the sources of a consortium's funding: the first -one measures the consortium's ability to attract special grants or generate income, thus giving us an insight into the consortium's ability to claim financial security; the second provides us with the value placed on the consortium by the members, expressed in the percentage of their budgets directed towards the consortium. In HEAL-Link's case, the consortium depends heavily on the Ministry's support than on its own resources. Whether this is a settlement that contributes to the consortium's sustainability or a different policy should take place remains to be decided.

The last four PIs measure the consortium's general efficiency in terms of serving its community by staff appointments and describe the staff placements in user services, IT services, and cooperative projects. For HEAL-Link, the results demonstrate a stability in this area. Whether the staff numbers and placements represent a well-desired balance in servicing their users or an increase would benefit a growth in this area, it is for the consortium to reflect upon.

Cooperative Electronic Content Licensing is one of the most common consortia services and one of the main reasons why libraries get together to negotiate a 'big deal' with a vendor or publisher. We calculated five -indicators for measuring performance in this service: three PIs assess the collection as a whole and two assess separately the use of each database the consortium purchases access to. Out of the first three PIs mentioned, two, '*Cost per Collection Use*' and the narrower indicator '*Acquisition Cost per Collection Use*', are rather basic indicators that determine cost-efficiency and complement the PI '*Cost per User*' attributed to Consortium Management. The third -one, '*Ratio of Acquisition Expenditures to Staff Costs*', offers a judgement on the balance of expenses and informs us whether a significant amount of funds is directed towards the enrichment of the collection. In HEAL-Link's case, the major part of the cost consists of acquisition expenditures. The consortium has succeeded in keeping the staff costs stable and the acquisition costs down. However, there is always room for

improvement and continued development and these indicators will aid the consortium in monitoring its progress.

The following two indicators refer to paid electronic resources and measure the adequacy of licenses to cover the users' needs and the cost-efficiency to meet said needs. Both indicators demonstrate that HEAL-Link is improving its performance in these areas. Our proposal, which categorises publishers in groups according to demand and sets a tolerance threshold below which action is required, is one of many strategies to form a decision-making policy. The consortium may have already employed several similar strategies and the ISO 11620 PIs could very well record their impact.

For the **Resource Sharing and InterLibrary Loan** we were able to calculate one indicator, the *'Percentage of Successful Interlibrary Loans'*, which is admittedly the most essential measurement for assessing the performance for this service. The speed of the service is also an insightful measurement described by the standard, and a consortium could decide to accumulate the suitable data for calculating the relevant indicator. In HEAL-Link's case the significant decrease in the use of the service calls for action. The consortium should consider whether the decrease is caused solely due to the pandemic or further adjustments are required. Either way, both the indicators measuring the percentage of successful loans and the speed of the service would be useful in assessing the consortium's performance in this area.

In addition to these insights, the indicators tell a story we can interpret in relation to the impact of two major events on the period covered in this study. Between 2018 and 2019 a massive merger wave in Greek higher education institutions took place, when the 22 public Universities and the 12 public Technological Educational Institutes of the country were merged into 25 Universities. As we point out in the results for the PI *B.4.3.2 'Percentage of Institutional Means Allocated to the Consortium'*, the libraries' budget cuts at the reduction rate of 59% were the reason behind the sudden rise -- and not the increase in membership fees.

The second event was none other than the new corona virus spreading into a pandemic throughout the world, causing all kinds of effects, including lockdowns that directed teachers and students toward distance-learning and the use of digital material. This resonates in the reduction of use of the ILL service by more than 60% between 2018 and 2020, as well as in the rise of use of e-resources around 50% for journals and 40% for e-books during 2020.

6.2 About assessing library consortia services using ISO 11620

During this study, we used a different set of criteria to categorise the ISO 11620 PIs, according to the eight categories of the most common consortia services (see section 2.1). In table IX, we cross-referenced these eight services to the standard's Balanced Scorecard approach to examine which areas are covered. As we have already pointed out, the standard categorises its -indicators under four main areas of measurement (table IX, rows) and five service/resource facets (table IX, columns). The common consortia services are noted by different colors (table IX, note). Thus, each cell registers a single PI that is defined by the measurement areas and resource facets of the ISO standard and color-coded by our own categorization of consortia services.

Table IX allows us at a glance to observe what facet (area or resource) is measured when applying the standard's PIs referring to a service. For example, we easily deduce that the standard focuses performance measurement on **Consortia Management** regarding mostly *Efficiency* and *Potentials and Development* in either *Staff* or *General* issues, leaving out *Use*, *Collection*, *Access*, and *Facilities*. In **Cooperative Electronic Content Licensing**, the standard measures all areas besides *Use*. In **Resource Sharing and InterLibrary Loan**, performance is measured in *Resources*, *Access*, and *Infrastructure*, and *Staff Efficiency*.

There are several PIs not correlated with common consortia services in this study, such as - *B.1.2.5 'Speed of Reference Transactions'*, which is obviously related to the performance measurement of reference services; or - *B.1.2.8 'Percentage of Rare Materials Needing Conservation/Restoration Treatment that Received Such Treatment'* referring to material preservation. Other -indicators, such as the ones associated by the standard with *Use*, measure the consortium's performance in responding to the needs of the audience (for example - *B.2.1.1 'Collection Turnover'*) or referring to general impact of the consortium (- *B.2.2.2 'Percentage of External Users'*). It is outside the scope of this study to make a detailed report on this, since more data have to be collected and analysed.

Table IX: Cross-reference of common consortia services to the ISO 11620 Balanced Scorecard approach (table by authors)

While we associated several PIs with a service, this does not mean that all -of them should be applied for a consortium to monitor its performance and certainly not all - are applicable to the consortia environment, such as not every -indicator can be implemented in every library setting. Plus, certain factors should be in place in order to use an indicator. The ISO 11620 addresses several of them: agreement of the stakeholders on the appropriateness of the indicator, personnel skills in assessment, allocating staff time and resources for the performance measurement, and availability of the necessary data (International Organization for Standardization, 2014, p. 15).

In selecting a set of indicators, a consortium should take into consideration the standard's criteria in testing a performance indicator. A PI should provide information for decision-making (*informative content*), should produce the same result when used under the same circumstances (*reliability*), should measure what is intended to measure (*validity*), should be compatible with the consortium's procedures, resources, and services (*appropriateness*), and should use data that can be produced with a reasonable amount of effort (*practicality*) (International Organization for Standardization, 2014, p. 11).

While the standard claims that PIs could be applied for benchmarking purposes (*comparability criterion*), it also defines certain precautions in comparing libraries (International Organization for Standardization, 2014, p. 16), which certainly apply to consortia assessment as well. Two different sets of concerns are raised: 1) the implementation of the -indicators and the data collection method should be standardised, and 2) factors such as mission, goals and objectives, resources, user groups, governance structure, and procedures should be taken into account. In the consortia environment, additional factors apply, such as type of library-members (public, academic, or more than one type), number of participating libraries, nationwide or regional participation, government or privately funded.

Therefore, while comparisons between different consortia are not excluded, the first and foremost reason for applying the ISO 11620 PIs remains the insight into a consortium performance, or the “self-diagnosis ... comparing one year’s performance with another”, as the standard dictates (International Organization for Standardization, 2014, p. 16).

Even if an indicator fulfils the criteria mentioned above, it does not mean that it is of equal importance as another, hence the concept of ‘Key Performance Indicators’ (KPIs), the “financial and non-financial metrics used to quantify objectives to reflect strategic performance of an organization” (SCONUL, 2021). The concept of KPIs has been widely implemented in every kind of organization, from enterprises to the public domain, in all aspects of organizational performance, from human resources and finance to sales and marketing (Parmenter, 2020). Several standards such as ISO 9000 family for quality management system (International Organization for Standardization, 2015) can be used by all sorts of organisations to implement Key Performance Indicators that demonstrate the organisation’s ability to serve their customers and continuously improve.

Appleton (2017, Ch. 9), taking the discussion of KPIs into the library setting, establishes four areas in which -indicators should measure performance: (1) Customer satisfaction, (2) Financial performance, (3) Internal processes, and (4) Employee development and satisfaction. There are several PIs suggested in the standard that could be used by a consortium to assess its performance in a strategic area. For example, ISO 11620 - *B.2.4.2 ‘User Satisfaction’* could act as a measurement of Customer satisfaction, - *B.1.2.3 ‘Speed of Interlibrary Lending’* could assess Internal processes. Financial performance is evaluated by - *B.3.1.1 ‘Cost per Collection Use’*, *B.3.1.2 ‘Acquisition Cost per Collection Use’*, and *B.3.1.3 ‘Cost per Download’* and Employee development and satisfaction by - *B.4.2.2 ‘Number of Attendance Hours at Formal Training Lessons per Staff Member’* and *B.4.2.3 ‘Percentage of Staff Time Spent in Training’*.

While several ISO 11620 -indicators can be considered KPIs, the standard as a whole covers the middle ground between general standards for organisations and standards specifically focused on the operation of libraries. Thus, ISO 11620 is library-focused in contrast with the ISO 9000 family mentioned above. Besides that, while ISO 11620 is designed to assess and measure performance, the ISO 9000 family addresses standardization of a product or service that leads to certification about quality assurance. On the other hand, specialised standards or tools used to monitor one library function (MINES for Libraries, COUNTER) or to survey users’ satisfaction (LibQUAL+) provide a valuable and in-depth evaluation, while ISO 11620 retains an overall inspection of libraries or in this case, consortia operation.

7 Conclusions

We found that ISO 11620 could be used not only to measure performance for library services, which it was initially designed for, but it could also be implemented for assessing consortia services. Monitoring an existing consortium’s management was accomplished by measuring economic efficiency, funding, and human resources. Therefore, the consortium is able to control financial and personnel issues more effectively. Measuring the consortium’s

performance on cooperative purchasing for e-resources was achieved by determining cost-efficiency, the balance of expenses, and the adequacy of licenses. Hence, the consortium has a solid base for deciding on which big deals to expand and which to attenuate. Finally, assessing the performance of resource sharing and interlibrary loan was realised by measuring the percentage of successful loans. This means that the consortium has an insight into the proper function of the service and the adequacy of the cumulative collection to satisfy the users' needs.

The overall view of PIs results draws a picture about HEAL-Link: the performance of the consortium, the services provided and their impact on the members and end-users, its strengths and weaknesses, and its sustainability and robustness. Seeing the impact of real-life events, such as mergers or even a pandemic, on the results of indicators confirms on one hand that the PIs can reflect reality. On the other hand, it imposes awareness about the importance of accurate interpretation of the results or the need to complement the basic insight ISO 11620 offers with other tools and standards.

Thus, ISO 11620 could be applied first and foremost for monitoring the consortia's progress, stability, or even recession. Taking into consideration additional precautions associated with the consortia environment, the standard could also be used for benchmarking purposes. Ultimately, a consortium will decide on how to measure performance according to the services it provides, its mission and strategic goals. Our contribution focuses on suggesting customisation of the ISO 11620 for consortia that is service-based. It rests upon a consortium's administration to decide on the appropriate and adequate performance measurement that refers to their services. Of course, several policies in collecting data, estimating indicators, and interpreting the results should take place, so that an assessment offers the much-needed insight. What we all agree upon is that consortia not only need to progress, they are also required to present proof by assessing their performance.

Closing, it should be mentioned that as this study is being published, the new ISO 11620 is being released. Since the main changes concern the addition of indicators for library training participation, library awareness and impact, staff research, and research support (International Organization for Standardization, 2023, p. iv), this study remains relevant to the main hypothesis, which is to establish that the library performance standard could be used to measure consortia performance. Future work is suggested to explore the compatibility of the new-added indicators with services commonly offered by consortia, such as programmes for users or staff training.

8 References

Alexander, A. W. (1999), "Toward the perfection of work", *Journal of Library Administration*, Vol. 28 No. 2, pp. 1–14. https://doi.org/10.1300/J111v28n02_01

Appleton, L. (2017), *Libraries and Key Performance Indicators: a framework for practitioners*, Chandos Publishing.

Bostick, S. L. (2001), "The history and development of academic library consortia in the United States: an overview", *The Journal of Academic Librarianship*, Vol. 27 No. 1, pp. 128–

130. [https://doi.org/10.1016/S0099-1333\(00\)00185-3](https://doi.org/10.1016/S0099-1333(00)00185-3)

CzechELib (2022), "Statistical system CELUS", available at: <https://www.czechelib.cz/en/347-statistical-system-celus> (accessed 10 February 2023).

Davis, D. M. (2006), "Library networks, cooperatives, and consortia: a definitional study and survey: Interim report I", available at: http://www.ala.org/tools/sites/ala.org.tools/files/content/librarystats/cooperatives/Incc/LNCC_overview_Anahei.pdf (accessed 10 February 2023).

Davis, D. M. (2009), "The condition of U.S. libraries: cooperatives trends, 2003-2009", available at: http://www.ala.org/tools/sites/ala.org.tools/files/content/librarystats/cooperatives/Condition_of_Libraries_1999.20.pdf (accessed 10 February 2023).

Dong, E. X. and Zou, T. J. (2009), "Library consortia in China", *LIBRES (Library and Information Science Research Electronic Journal)*, Vol. 19 No. 1, pp. 1–10.

Garthwait, C. and Richardson, E. A. (2008), "LibQUAL+™ in a consortium: KLN's challenges and considerations", *New Library World*, Vol. 109 No. 11-12, pp. 499–511.
<https://doi.org/10.1108/03074800810921322>

Gatten, J. N. (2004), "Measuring consortium impact on user perceptions: OhioLINK and LibQUAL+™", *The Journal of Academic Librarianship*, Vol. 30 No. 3, pp. 222–228.
<https://doi.org/10.1016/j.acalib.2004.02.004>

Gonda, T. and Papatheodorou, C. (2021), "Measuring library consortia performance", in *14th International Conference on Performance Measurement in Libraries (LibPMC)*, pp. 201–211.
<https://doi.org/10.5281/zenodo.6319521>

Harnesk, J. (1997), "The ISO Standard on library performance indicators (ISO 11620)", in *2nd Northumbria International Conference on Performance Measurement in Libraries and Information Services*, pp. 61–65.

Horton, V. and Provenitz, G. (Ed.s.) (2015), *Library consortia: models for collaboration and sustainability*, ALA editions, Chicago.

International Organization for Standardization (2014), *Information and documentation — Library performance indicators* (ISO Standard No. 11620-2014).

International Organization for Standardization (2023), *Information and documentation — Library performance indicators* (ISO Standard No. 11620-2023).

International Organization for Standardization (2015), *Quality management systems — Fundamentals and vocabulary* (ISO Standard No. 9000-2015).

Kohl, D. F. and Dervos, C. (1999), "Getting acquainted: HEAL-Link, the Greek National Academic Library Consortium", *Library Consortium Management: an International Journal*, Vol. 1 No 3/4. <https://doi.org/10.1108/lcmij.1999.24701cab.002>

Kopp, J. J. (1998), "Library consortia and information technology: the past, the present, the promise", *Information Technology and Libraries*, Vol. 17 No. 1, pp. 7–12.

Lee, T. (2004), "Exploring outcomes assessment: the AAHSL LibQUAL+(™) experience", *Journal of Library Administration*, Vol. 40 No. 3–4, pp. 49–58.
https://doi.org/10.1300/J111v40n03_04

Machovec, G. (2013), "Library consortia: the big picture", *Journal of Library Administration*,

Vol. 53 No. 2-3, pp. 199–208. <https://doi.org/10.1080/01930826.2013.853504>

Machovec, G. (2015), "Calculating the Return on Investment (ROI) for Library Consortia", *Journal of Library Administration*, Vol. 55 No. 5, pp. 414–424. <https://doi.org/10.1080/01930826.2015.1047282>

Mackenzie, M. L., Penniman, W. D. and Woodsworth, A. (2013), "Lessons from the Corporate World", in Woodsworth, A. and Penniman, W.D. (Ed.s.) *Mergers and Alliances: the Wider View (Advances in Librarianship, Vol. 36)*, Emerald Group Publishing Limited, Bingley, pp. 29–60. [https://doi.org/10.1108/S0065-2830\(2013\)0000036005](https://doi.org/10.1108/S0065-2830(2013)0000036005)

McDonald, J. *et al.* (2018), "Library Analytics: shaping the future - consortial usage statistics analytics and the CC-PLUS project ", *Against the Grain*, Vol. 30 No. 4. <https://doi.org/10.7771/2380-176X.8310>

Melo, L. B. and Pires, C. (2008), "Performance Evaluation of Academic Libraries Implementation Model", in *17th Hellenic Conference of Academic Libraries - Academic Library Evaluation as a measure of Institutional Quality Assessment*, Ioannina, Greece.

Melo, L. B. and Pires, C. (2012), "Which factors influence the willingness to pay for electronic library services? A study of the Portuguese electronic scientific information consortium b-on", *Journal of Librarianship and Information Science*, Vol. 44 No. 3, pp. 185–198. <https://doi.org/10.1177/0961000611408645>

O'Farrell, J. (1998), "'The ISO 11620 standard and library automated systems", *New Library World*, Vol. 99 No. 6, pp. 254-259. <https://doi.org/10.1108/03074809810236829>

OCLC (2012), "U.S. library consortia: a snapshot of priorities and perspectives", report 214986USB-C 1306, available at: <http://www.oclc.org/en/reports/us-consortia.html> (accessed 10 February 2023).

Parmenter, D. (2020), *Key performance indicators: developing, implementing, and using winning KPIs*, 4rd ed., Wiley, Hoboken, New Jersey.

Passonneau, S. M. (2013), "Library assessment activities: using ISO 11620 to review the assessment data of academic libraries in North America", *Performance Measurement and Metrics*, Vol. 14 No. 3, pp. 175–196. <https://doi.org/10.1108/PMM-05-2013-0015>

Pateman, J. (2011), 'Public libraries, social class and social justice', *Information, Society and Justice*, Vol. 4 No. 2, pp. 57–70.

Plum, T. *et al.* (2010), 'Measuring the impact of networked electronic resources: developing an assessment infrastructure for libraries, state, and other types of consortia', *Performance Measurement and Metrics*, Vol. 11 No. 2, pp. 184–198. <https://doi.org/10.1108/14678041011064098>

Scepanski, J.M. and Wells, H.L. (2013), "Regional Library Networks and OCLC: From Collaboration and Interdependence to Conflict and Divorce", Woodsworth, A. and Penniman, W.D. (Ed.s.) *Mergers and Alliances: the Wider View (Advances in Librarianship, Vol. 36)*, Emerald Group Publishing Limited, Bingley, pp. 85-106. [https://doi.org/10.1108/S0065-2830\(2013\)0000036007](https://doi.org/10.1108/S0065-2830(2013)0000036007)

SCONUL (2021), "Key Performance Indicators", available at: <https://www.sconul.ac.uk/page/key-performance-indicators> (accessed 12 April 2023).

Sputore, A. and Fitzgibbons, M. (2017), "Assessing 'Goodness': a review of quality frameworks for Australian academic libraries", *Journal of the Australian Library and*

Information Association, Vol. 66 No. 3, pp. 207–230.
<https://doi.org/10.1080/24750158.2017.1344794>

Swiatek, C. (2019), "European academic libraries Key Performance Indicators (KPI): how comparison helps decision making", *Performance Measurement and Metrics*, Vol. 20 No. 3, pp. 143–158. <https://doi.org/10.1108/PMM-08-2019-0041>

Weber, D. C. (1976), "A century of cooperative programs among academic libraries", *College & Research Libraries*, Vol. 37 No. 3, pp. 205–221. https://doi.org/10.5860/crl_37_03_205

Ye, L., Yang, W. and Lin, W. (2018), "DRAA e-resources usage statistics services in China: research and practice", *Electronic Library*, Vol. 36 No. 6, pp. 1043–1061.
<https://doi.org/10.1108/EL-01-2018-0002>

Web resources

[1] HEAL-Link, <https://www.heal-link.gr/en/>

[2] LibQUAL+, consortia participation, https://www.libqual.org/about/consortia_24/3/2022

[3] HEAL-Link, data repository 'HARDMIN', <https://hardmin.heal-link.gr/en/>

[4] HEAL-Link, support services staff (in Greek), <https://www.heal-link.gr/%CF%85%CF%80%CE%BF%CF%83%CF%84%CE%AE%CF%81%CE%B9%CE%BE%CE%B7-%CF%83%CE%B5%CE%B1%CE%B2/>

[5] HEAL-Link, list of members, <https://www.heal-link.gr/en/members/>

[6] HEAL-Link, shared catalogue 'MITOS', https://opac.seab.gr/*eng

[7] Greek Ministry of Administrative Reform and e-Governance, Transparency Programme initiative 'Diavgeia', <https://diavgeia.gov.gr/en>

[8] HEAL-Link, Quality Assurance Unit of Academic Libraries, <https://mopab.seab.gr/?q=en>

[9] Greek Ministry of Education and Religious Affairs, <https://www.minedu.gov.gr/>