Assessing the effectiveness of a national resource sharing system

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Abstract
Purpose – The purpose of this paper is to report on the surveys, carried out during 2011 and 2013, regarding the functionality of and possible improvements to Italy’s nationwide resource sharing service NILDE (Network for Inter-Library Document Exchange).

Design/methodology/approach – The methodology comprises both an analysis of quantitative data about ILL transactions initiated during a 2011 study and a qualitative assessment of the system based on information obtained from the surveys and a SWOT analysis. This proved to be an effective methodology, and a new survey was launched in 2013 to verify whether the choices made and the projects undertaken were in line with user expectations.

Findings – The results turned out to be particularly interesting and a source of hints for planning future improvements.

Originality/value – Italian studies for assessing user satisfaction of library services, based on user surveys, often relate to a single library or a single University. The NILDE survey was delivered nationwide to all the registered users of NILDE. This is the most extensive survey for the number of libraries and the various types of end users involved.

Keywords Italy, Interlibrary loan, Document supply, ILL, User satisfaction surveys, NILDE

Paper type Research paper

Background
The NILDE (Network for Inter-Library Document Exchange) system was initially developed at the Italian National Research Council Bologna Research Area Library with the aim of improving ILL services and promoting cooperation among Italian libraries (Mangiaracina, 2002; Mangiaracina et al., 2008). At present, 830 libraries belong to the NILDE network, of which 77 per cent are university libraries, 9 per cent health research institutes and hospitals, 8 per cent public research institutions and 6 per cent other public and not-for-profit organizations.

In 2005, an end user interface was added which is presently used by more than 18,000 end users registered at their libraries. The direct use of NILDE has obvious advantages for all users (Cocever and Chiandoni, 2008). Advantages for the libraries are:

• the ability to receive completed request forms in the correct format through a single channel;
• the ability to update users automatically on the status of their requests in real time;
• the availability of detailed statistics on user transactions and on user profiles; and
• access control to the service based on institutional authentication (for the libraries which form part of the Italian IDEM Federation).

Advantages for the users are:

• interoperability with bibliographic databases which facilitates the automatic transfer of bibliographic data into the NILDE request form;
• a personal workspace which incorporates an embedded reference manager system (added in 2011);
• the availability of an automatic communication flow, which provides real-time updates on the status of transactions; and
• the use of institutional credentials to access the services to avoid multiple authentication (for the institutions belonging to the IDEM federation).

The current NILDE 4.0 software, released in 2011, introduced new features and innovations to the user interface to make it a more user-friendly tool for ILL and scholarly...
activities (Mangiaracina and Tugnoli, 2012). NILDE’s present features comprise:

- a complete suite of ILL manager software modules, including statistics/history to monitor ILL performance indicators such as fill-rate and turnaround time;
- a secure electronic document transmission module (PDF files are “digital hard-copied”), that is, automatically transformed into graphic files, to comply with ILL clauses in electronic licenses that usually do not allow the sending of the publisher’s original PDF file, but only of a printed copy;
- a dedicated end user module to manage personal bibliographical references, allowing users to easily import, organize and export references, and to initiate an ILL request from any bibliographic electronic resource based on the OpenURL standard;
- federated end user authentication based on the Shibboleth framework; and
- multilingual support, including user interfaces in Italian, English, Spanish, French and Greek.

The NILDE end users module, initially conceived as a basic tool simply for managing user requests to the library ILL service, has evolved into a reference manager which allows the user to organize their own bibliography as well as to formulate a request to the library’s ILL service if the document is not locally accessible. Bibliographic references can be inserted either manually by the end user or automatically from any OpenURL-compliant database. The most important feature added to the end user module is the facility to manage their entire bibliography by labelling, sorting and exporting references as well as inserting, modifying and deleting them.

The user is also allowed to send DD/ILL requests during new insertions or to request any item which is already in their bibliography. In this case, NILDE provides functions to track new insertions or to request any item which is already in their bibliography. In this case, NILDE provides functions to track new insertions or to request any item which is already in their bibliography. In this case, NILDE provides functions to track new insertions or to request any item which is already in their bibliography. In this case, NILDE provides functions to track new insertions or to request any item which is already in their bibliography. In this case, NILDE provides functions to track new insertions or to request any item which is already in their bibliography. In this case, NILDE provides functions to track new insertions or to request any item which is already in their bibliography. 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lack of communication and motivation of librarians and on their resistance to full use of the software[1].

The impact of all these advocating activities can be seen in Table I, which shows that libraries that implemented user-initiated requesting through NILDE in 2012 had expanded their user base one year later and the number of libraries with 10 or more end users increased by 32 per cent. In addition, the total number of end users ballooned by 62 per cent in that same year. Likewise, Figure 1 illustrates the one-year increase in NILDE end users per library.

There is still, however, a big share (more than two-third) of networked libraries which do not use the end user module. Analysis of the quantitative data from ILL transactions proves that there is a significant difference between the libraries that enable users to submit requests directly and libraries that do not, and shows that the average number of ILL requests more than doubles when users have direct access to the software, as can be seen in Table II. This phenomenon may have multiple explanations. It could be that libraries which have not chosen NILDE to communicate with their users may employ other channels to forward ILL requests (or may use email to a great extent, both to receive user requests and to forward them to other libraries). On the other hand, it may be that users who have access to NILDE’s end user interface and are satisfied with it are encouraged to exploit it, and therefore, the direct use of NILDE promotes an increase in library ILL requests (and consequently a greater use of library services). This suggests the end user interface is helping libraries meet previously unmet user needs.

Although libraries which implement the direct use mode may seem more virtuous than the others, much more can still be done in terms of service quality improvement: in fact, only one-third (32, 385) of user-initiated ILL requests have bibliographic metadata loaded from a database, which means that the remaining two-third (69, 826) of bibliographic references were manually entered by the end users. Moreover, 91 per cent of the references entered through the OpenURL protocol come from PubMed, while the connection between NILDE and other bibliographic databases, even the most popular ones such as Web of Science or Scopus, is of little consequence, as shown in Table III.

The quantitative data highlight the effectiveness of staff training initiatives over the past year, but they also emphasize the overall underuse of the software by end users. We wonder, for instance, why users prefer to enter manually the bibliographic records of their requests, given that they could load the metadata directly from bibliographic databases, or else why the embedded reference manager is not perceived as a value-added service. To answer these and other questions, another survey targeting end users only was carried out in 2013.

Assessing user satisfaction

Survey methodology

A focus on library-user satisfaction in Italy was introduced at the AIB (Associazione Italiana Bibliotecari) annual congress in Villasimius in 1984 (Santocchini, 2010). The relationship between library and perceived service quality by the user has been

<table>
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<tr>
<th>One-year NILDE ILL transactions</th>
<th>Total</th>
<th>(%)</th>
<th>Average no. of requests per library</th>
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<tbody>
<tr>
<td>Number of participating libraries</td>
<td>796</td>
<td></td>
<td></td>
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<tr>
<td>Total ILL requests</td>
<td>219,259</td>
<td>275</td>
<td></td>
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<tr>
<td>Number of libraries with at least ten end users that allow DIRECT USE by their end users</td>
<td>235</td>
<td>30</td>
<td></td>
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<tr>
<td>Total ILL requests from libraries that allow DIRECT USE</td>
<td>106,034</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Number of libraries that do not allow DIRECT USE by their end user (or, with less than ten end users)</td>
<td>561</td>
<td>70</td>
<td></td>
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<tr>
<td>Total ILL requests from libraries that do not allow DIRECT USE</td>
<td>113,225</td>
<td>52</td>
<td></td>
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</table>

Note: (7/1/2012 to 6/30/2013)
more recently investigated by Di Domenico (2006) and Ventura (2006). Oliva (2012) discusses customer satisfaction in Italian academic libraries, specifically a 2012 survey of user satisfaction at the Milano-Bicocca University library; qualitative and quantitative results are then presented and discussed. Italian studies for assessing user satisfaction of library services, however, often relate to a single library or university.

However, a careful approach is needed when conducting such surveys on a nationwide scale, as the NILDE network represents a heterogeneous environment comprising public, academic and healthcare sectors, and scientific research institution libraries, whose collections span a broad range of subject areas and whose constituencies are widely divergent with respect to numbers and types of users.

The 2013 survey was delivered nationwide to all the 17,792 registered users of NILDE; this is the most extensive survey for the number of libraries and the various types of end users involved.

The data were collected via the Web, and the questions were hosted on a special WordPress blog. A blog enables users to add free comments instead of merely answering the closed-ended questions of the survey, and this is why it was chosen.

All comments, and especially the critical remarks, were particularly valuable inasmuch as they provided useful hints on how to improve the service and started a discussion among stakeholders, i.e. librarians and end users.

The two-part survey was created as a Google form (available within Google Drive).

The first set of questions, eight in all, was aimed at gathering both quantitative and qualitative feedback from end users on the NILDE service and at finding out how they had come to know about the NILDE service. The second set of questions, six in all, was designed to know end users better (age, gender, role, etc.).

The initiative was publicized through a message on the NILDE home page, visible to everyone who accessed the Web site while the survey was open. During that period (27 May 2013-2019 July 2013), the libraries in the NILDE network were asked twice to remind their users of the survey through the communication channels normally used for similar purposes.

The outcome of these reminders was successful: 1,178 people, representing 17 per cent of active users, completed the survey. Active users were defined as users who had requested at least one article through the NILDE service between 1 January 2013 and 30 June 2013; their total number amounted to 6,987. The percentage of responses was weighed against active users, on the assumption that they were more loyal and sensitive to service improvement than the total number of users, who amounted to 17,792.

When the survey was closed, the final data, available in real time and also displayed in chart form, were linked to the NILDE home page[2].

Survey results and discussion

The data gathered by the 2013 survey make it possible to build a profile of the users who are loyal to NILDE. The term “loyal users” is applicable because the respondents to the survey were the most intensive users: 70 per cent requested more than four articles in the first six months of 2013, 38 per cent more than ten. This is even more apparent when compared to the figures extracted from the NILDE database (see Table IV).

Quantitative data are important, but it is also important to point out that these users perceive the service as a useful tool for their work. The question “To what extent has NILDE contributed to your research in 2012/searches?” scored an average of 3.64 on an assessment scale ranging from a minimum of 1 to a maximum of 5. The typical user is a female researcher in science and technology, between 25 and 34 years of age, working at an Italian university located in the Centre/ North of the country. Analysis of the sample partaking in the survey highlights another very interesting feature: libraries play a major role in promoting and advocating. As mentioned above, while the survey was open, the organizers urged the libraries several times to prompt their users, and this resulted in an increased response rate.

These initiatives had in some cases greater impact; this is highlighted when comparing the data related to the participants to the total number of active users.

Table V shows that the percentage of the survey participants affiliated with public research institutions is much higher than what it was compared to the total number of active users on 30 June 2013. These libraries were clearly more effective in promoting the survey.

Generally speaking, communication turns out to be of paramount importance for libraries, which perform a key function in informing users about services. In this respect, it is significant that 49 per cent of the end users stated that they had been informed about NILDE by the library staff and 24 per cent through their website. If on the one hand the survey represents the most loyal segment of users, on the other hand, to some extent, it also represents the subset of networked libraries that mostly perceive NILDE as an important service for their target community.

Table IV Comparison of NILDE usage between active users vs all survey participants

<table>
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<th>No. of ILL requests</th>
<th>NILDE active users January-June 2013 (%)</th>
<th>Survey participants (%)</th>
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<tr>
<td>1-3 ILL requests</td>
<td>41</td>
<td>23</td>
</tr>
<tr>
<td>4-10 ILL requests</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>More than 10 ILL</td>
<td>21</td>
<td>38</td>
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When profiling loyal users, it is interesting to note that responses were split almost equally between genders: 51 per cent female respondents and 49 per cent male respondents.

It is significant that among the participants, 69 per cent of the women were between 25 and 44 years of age, while men within the same age range amounted to 56 per cent. On the contrary, women > 45 years of age were 29 per cent while men > 45 years of age were 41 per cent. The users of NILDE consequently mirror the general trends; women are increasingly present in the Italian scientific research landscape, especially with ages between 25 and 44, i.e. 62 per cent of the participants in the survey.

As mentioned before, the survey was aimed at getting to know users better, and consequently, some questions were asked about their behaviour when seeking papers.

A total of 67 per cent chose mainly NILDE and 23 per cent of them NILDE exclusively. It is interesting also to notice that 81 per cent state that they always – or almost always – surf the net to check whether papers are freely available. This behaviour is obviously encouraged by the outcomes of Web searches; very many digital documents are freely downloadable. The consequence of increasing Open Access to research outputs is, ironically, a prospective decrease in interlibrary loan services. In the information society, the transition from a former economy based on shortage to a net economy based on plenty is questioning current paradigms and economic models. Libraries also have to readjust their objectives and to focus on the documents for which they may be the sole provider and which are difficult to find.

Some comments on the blog which hosted the survey stress one of the main strengths of NILDE, i.e. the possibility to find papers which are old and therefore not in electronic journals, and not available elsewhere. The interoperability of NILDE with the main national online catalogues (see, for example, Mangiaracina and Tugnoli, 2012) makes it easier for staff to search for documents and check their availability. The effectiveness of the service is therefore dependent on the comprehensiveness of these sources, and libraries have a prime role inasmuch as they update and maintain their catalogues.

As for other behaviours, purchasing papers is the least chosen option (84 per cent state they never do it); next, using the credentials of other institutions (86 per cent never do it or do it rarely).

The starting point for improving a service effectively is to ask users first. Therefore, there were questions about the most important features and functionalities of a document delivery service; first, generally speaking and then focusing on the specific characteristics of NILDE.

A four-point grade scale was used to assess first a document delivery service in general terms; scores ranked from 1 (very low importance) to 4 (very high importance); and the average responses are shown in Figure 2.

The most important features are, in order of importance, the online access to the service, availability of electronic papers, response time and integration with bibliographic databases. Users consequently expect a service which enables them to obtain documents quickly through a single tool linked to bibliographic databases, where the descriptive metadata of the requests are extracted automatically, and which make it possible to track the transactions until the articles are delivered electronically.

NILDE is, in fact, a Web service that performs all the abovementioned functions, while a rapid response is ensured...
by the delivering libraries spontaneously maintaining a high standard of performance. The availability of electronic documents directly to the users is contrary to the present copyright law; 55 per cent of the respondents declare they know about it, but, if that were true, there would not be such an urgent request of electronic papers, which was echoed both in responses and in blog comments. Users often complain about having to receive the paper document, suddenly plunging back into the space-time constraints of physical reality, and they perceive it as if it were the library’s fault. Researchers need to perform their activities anywhere and at any time, and they are connected through the Web to research laboratories disseminated over vast geographic areas; it is, therefore, understandable that such constraints are not considered to be acceptable. Here too, librarians have the task of informing and making users aware of the constraints of copyright law, which often does not protect the rights of authors who need to re-use research outputs for their own work, but protects the economic interests of the commercial publishers which control the scientific literature market.

The response to the features of NILDE which need to be improved back up what has been said above: the starting point for requests must be the tool used for bibliographic searches (25 per cent of the responses); one concern is the need to exploit the Web to its full potential through applications for mobile devices (15 per cent of the responses); and one of the main concerns is interface usability (11 per cent of the responses). Software underuse is a particularly evident problem regarding the interoperability with bibliographic databases, which is already there but which is patently unknown to users. It will be useful to undertake initiatives aimed at exploring the causes for this knowledge gap soon, beginning with librarians themselves who have the task of imparting knowledge useful for the optimal use of bibliographic services.

### Strengths, weaknesses, opportunities and threats analysis

Analysis of the quantitative and qualitative data collected led to identification of the critical features which need priority action. An excellent planning tool is SWOT (strengths, weaknesses, opportunities and threats) analysis, as it helps to sum up the features which may affect the outcome of ongoing and future initiatives both positively and negatively. It is also very important to analyze the external context which presents favourable or unfavourable circumstances which cannot be overlooked, lest the outcome of ameliorating initiatives be jeopardized.

**Figure 3** shows SWOT analysis of NILDE, conducted by Cristina Cocever and Silvana Mangiaracina, based on the aforementioned considerations.

#### Conclusions

Assessment of the NILDE service over the past few years is based on a comparison between the quantitative data gathered from the NILDE databases and the qualitative data collected through user

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<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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<tr>
<td>1. Strong cohesion and cooperation among participants</td>
<td>1. Low direct use by end users</td>
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<tr>
<td>2. Widespread adoption in Italy</td>
<td>2. Partial subject coverage due to the specific organizations involved</td>
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<tr>
<td>3. Excellent performance (turnaround times, positive responses...)</td>
<td>3. Publishers’ unwillingness to recognize the reliability of the NILDE software which prevents the direct forwarding of electronic documents to end users</td>
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<td>4. High end user appreciation</td>
<td>4. Staff resistance and organizational difficulties</td>
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<td>5. Regular and competent technical support</td>
<td>5. Low level of cooperation outside Italy</td>
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<td>6. Connections with the main national catalogues</td>
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<td>7. Interoperability with bibliographic databases</td>
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<td>8. Continuous improvements</td>
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<td>9. Frequent training initiatives</td>
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<td>10. Relatively low cost of the service</td>
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<th>OPPORTUNITIES</th>
<th>THREATS</th>
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<td>1. Budget cuts affecting journal subscriptions</td>
<td>1. Increased Open Access and peer2peer</td>
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<td>2. Few competitors in Italy</td>
<td>2. Organizational problems caused by understaffing in libraries</td>
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<tr>
<td>3. Widespread use of web services, especially among researchers</td>
<td>3. Greater restrictions by publishers</td>
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<td>4. High interest in cooperation initiatives by the libraries</td>
<td>4. Lack of harmonization of European copyright laws</td>
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<tr>
<td>5. Excellent technological infrastructures supporting research networks</td>
<td>5. Economic crises and shrinking budgets</td>
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<tr>
<td>6. Ongoing development and updating of the main national online catalogues (ACNP, SBN)</td>
<td>6. User distrust of public services</td>
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<tr>
<td>7. Interest in NILDE by the managers of the main online national catalogues</td>
<td>7. Researchers’ propensity to leave Italy</td>
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<tr>
<td>8. Publicly perceived importance of scientific research for the development of Italy</td>
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Effectiveness of a national resource sharing system
Silvana Mangiaracina et al.

surveys. The results turned out to be particularly interesting and a source of hints for planning future improvements.

In 2011, the quantitative data stressed the high productivity of the few libraries which had a significant number of users submitting requests directly; the survey highlighted, on the one hand, user appreciation and, on the other, staff resistance, as users were not considered ready to use the system directly.

Library staff training was carried out in 2012 which led to an increase both in active users and in libraries enabling users to submit requests directly; yet, there is still much more to do. Less than one-third of the networked libraries are involved, and the results of staff encouragement still have to be seen. Re-engineering a service depends on many factors and requires time, because librarians also have the task of being the agents of change, and this involves not only users, but also those in charge of their structures, whose support cannot be taken for granted.

The 2013 survey made it possible first of all to identify the features of the typical user loyal to NILDE: a female researcher in science and technology between 25 and 34 years of age working at a University in the Centre/North of Italy. Much could be done to involve also other potential segments of users, such as students in the case of universities. However, as mentioned above, NILDE has an extremely heterogeneous target audience and all initiatives can only be started by single libraries on an individual basis. An important feature, highlighted in the 2013 survey, is that organizational problems can occur even in libraries which adopt and promote the direct end user mode.

One of the features most requested by the survey participants is integration of NILDE with bibliographic databases, which is, in fact, already possible; this incongruence had already been highlighted by the quantitative data too. Future staff training will have to include the technologies that enable data interoperability, to make it easier for librarians to interact with system administrators, who have to configure the connections.

The unavailability of the electronic document for the end user, widely indicated as a big issue, cannot be easily solved because it stems from the constraints of copyright law and thus is beyond the power of NILDE to fix.

In the near future, resources will have to be invested to create NILDE applications for mobile devices. Periodical monitoring of quantitative data, as well as listening to end users, makes it possible to determine choices and optimize resources. SWOT analysis is a very good planning tool because it helps to assess the information gathered and to identify the elements inside and outside the service which may affect future action.

Notes

2 The results of the 2013 user satisfaction survey are posted on the NILDE blog site, http://nildesurvey.wordpress.com/il-punto-di-vista-degli-utenti-sondaggio-2013/ - click on “riassunto delle risposte”.

References

Further reading:

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