

Subject search in Italian OPACs: an opportunity in waiting?

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Abstract:

Subject access to bibliographic data supported by knowledge organization systems, such as subject headings and classification, plays an important role in ensuring the quality of library catalogues. It is generally acknowledged that users have a strong affinity to subject browsing and searching and are inclined to follow meaningful links between resources. Research studies, however, show that library OPACs are not designed to support or make good use of subject indexes and their underlying semantic structure.

A project entitled *OPAC semantici* was initiated in 2003 by a number of Italian subject specialists and the Italian "Research Group on Subject Indexing" (GRIS) with a goal to analyse and evaluate subject access in Italian library catalogues through a survey of 150 OPACs. Applying the same methodology, a follow-up survey to assess whether any improvement had taken place was conducted five years later, in spring 2008. Analysis of these two surveys indicated that there was a slight improvement.

The authors discuss the results of these two surveys, analyse the problems in subject searching in OPACs and explain the recommendations for subject searching enhancement put forward by GRIS. Using the example of Italian OPACs, the authors will attempt to outline some requirements for a subject searching interface and explain how this can be achieved through authority control.

1 Introduction to OPAC subject searching and difficulties in catalogue use

Subject data can help libraries communicate the true value of large and well organized library collections. Subject indexes represent semantic knowledge maps of library collections and create added value in information discovery by enabling navigation through a knowledge space. It is not surprising, therefore, as numerous studies have shown, that subject searching represents the majority of OPAC searches and that, when supported, subject access is favoured by users (Maltby & Duxbry, 1972; Bassant, 1982; Markey, 1983; Hancock, 1987; Hildreth, 1990; Gödert & Horny 1990; Cousins, 1992).

Research conducted in the area of user information behaviour through TLA (transaction log analysis), questionnaires, interviews, focus groups and direct observation, have showed, however, not only a high proportion

of subject searching but also a high proportion of failures in finding pertinent information (Hildreth, 1990; Larson, 1991, 1991a; Markey & Weller, 1996; Yu & Young, 2004). Many studies of OPAC searching have demonstrated that users experience problems in finding the correct search term, and not being able to increase recall when results were too few or increase precision when there were too many items found.

Frequently when using OPACs users have information searching requirements that library catalogues do not meet (cf. On line catalogs: what users and librarians want?, 2009). This is often the case when search terms used by patrons do not match indexing terms supported by subject searching in catalogues and it reveals the weakness of a subject indexing language which should, obviously, be updated and extended with a greater number of synonyms i.e. equivalent terms. It is also often the case that patrons look for a term that the cataloguers have not used and searching produces zero results which is accompanied by an on-screen explanation 'no documents found matching the query', while the actual meaning is 'you did not use the same term as a cataloguer'.¹

It appears that users have objective difficulties when looking for documents about certain subject and formulating their information problem. At the same time subject data available in bibliographic records are a readily-available remedy for this problem and many research projects illustrate how the use of classification and subject headings can improve information discovery in OPACs (Piascik, 1993; Hildreth, 1995; Markey, 1986, 1990, 1996, 1996a; Gödert, 2003). The OPAC studies show, however, that catalogues are making very poor use of subject data. In some cases the situation was described as being so poor that it made the professional community question the very purpose of subject indexing where catalogues were designed to be deficient in supporting subject access (Markey, 1986; Hancock, 1987; Crawford, Thom & Powles, 1993; Calhoun, 2006).

In order to learn more about the problems of subject searching in OPACs and hopefully contribute to their improvement, a project entitled *Opac semantici* was initiated in 2003 by Italian subject specialists. One of the aims of the project was to assess and evaluate the use of subject indexing (subject headings, thesauri, and classifications) in 150 Italian online library catalogues. Aligning the modern OPAC technology with findings from some of the previous research (Poll & Boekhorst, 1996; Goedert & Horny, 1990; Guerrini, 2000), The *Opac semantici* project

¹ This is, for instance, one of the issues addressed in Guidelines for OPAC displays (2005) which in its chapter 3 provide specific proposal how to resolve this problem

created their own checklist method to be able to observe and collect data on subject searching. In order to evaluate the extent to which subject access had evolved, if at all, two surveys based on a checklist of functionalities were conducted over a five year period.

2 OPAC semantici project

With library automation and the transition from card to online catalogues (OPACs), priority was given to a retrospective conversion and the focus was mainly on formal cataloguing and capturing of document identification data. As a result of the apparent negligence of content description and subject access to the collection, Italian online library catalogues have become impoverished versions of their card predecessors. Catalogues have lost much of the semantically rich content information and thus one of their fundamental functions in finding information 'about something' was diminished significantly.

When searching library catalogues users should, normally, be able to perform three types of searches corresponding to three types of information needs:

- a) finding *known* documents through searching for authors, titles, publishers
- b) finding *unknown* documents about specific subjects through searching assigned subject terms or expressions from a controlled vocabulary
- c) finding *unknown* documents pertaining to a certain scientific discipline or field of knowledge - through browsing or searching of knowledge classification

It is obvious that seeking content-based information through an alphabetical indexing language or classification corresponds to most common information needs.

Understandably, the recently published *Statements of International Cataloguing Principles* (2009) stresses that controlled subject terms and/or classification numbers are essential access points in bibliographic records. This implies that these access points should always be present in a bibliographic record.

When we try to use and navigate OPACs, however, we become aware that although subject data may be present in the catalogue they are found only through secondary or advanced options in searching. The IFLA *Guidelines for*

online public access catalogue (OPAC) displays (2005) acknowledges this weakness and suggests that this interface problem be resolved through introducing more appropriate subject searching and navigation.

Current developments in the information technology domain place even more emphasis on subject information and move the library tradition in information and knowledge organization into a different context. The terms 'knowledge systems' and 'semantic' are currently frequently used in relation to the development of the Semantic Web, semantic search engines and social tagging within Web 2.0.

In this 'semantic' landscape, the aim of the *Opac semantici*² project was to look into how such 'semantic' information discovery can be supported by Italian OPACs in which one can observe, evaluate and exploit library expertise and techniques in document indexing. The project was initiated following a spontaneous get-together by Claudio Gnoli, Riccardo Ridi and Giulia Visintin who then took on the rôle of project coordinators and established collaboration with the Research Group on Subject Indexing, known by its abbreviation GRIS (Gruppo di ricerca sull'indicizzazione per soggetto).³

The project was articulated in several phases. The first phase was the development of the OPAC evaluation checklist with a coding system to facilitate data collection during the OPAC survey.⁴

The checklist contained functionalities and features that may be present or absent in an OPAC and consists of around fifty questions organized in the following wider groups:

- A. information about subject access⁵
- B. subject access through subject-headings
- C. subject access through classmark
- D. visualisation of subject browsing
- E. visualization in record display

² The OPAC Semantici Project website: <<http://mate.unipv.it/biblio/sem/>>

³ GRIS website: <<http://www.aib.it/aib/commiss/gris/gris.htm>>

⁴ The OPAC semantici survey checklist is available at <<http://mate.unipv.it/biblio/sem/lista.htm>>

⁵ In OPAC semantici project the term used for subject access was 'accessi semantici' hence this checklist area was called 'informazioni sugli accessi semantici'

Data collection based on the checklist was coded in such a way that more positive responses corresponded to more functionalities being supported; this indicating better subject access and more information being semantically related. Based on this simple method it was possible to define an index of 'semanticity' whereby an OPAC scoring 100 points would represent an ideal 'semantic OPAC'.

The survey was conducted in autumn 2003 and included a selection of 150 catalogues chosen from a total of 600 Italian OPACs⁶. Around fifteen researchers were included in the study, the majority of whom were students participating in the Electronic Publishing course from the Ca' Foscari University of Venice. The remainder were volunteering professionals coordinated via electronic mail. All researchers were instructed to record objectively the range of functionalities supported and to observe OPACs from the point of view of a library user.

In order to assess whether subject access had evolved, the same survey was repeated in spring 2008, five years after the initial research. The same checklist was applied on the same selection of OPACs. The researchers involved in the second survey were library and information professionals.

2.1 Comparison of surveys

The results of the first survey (Gnoli, Ridi, Visintin, 2004) showed an average score of 'semanticity' of 26.5 and indicated a general low level in subject access support. Five years later, the research reported an average score of 30.5. Although this showed a measurable improvement it did not move much closer to the ideal score of 100.

The complete results of both surveys are published and available on the project website⁷. In this paper we would like to outline and compare some of the more interesting findings within the five major groups of checklist functionalities observed.

A. Information on subject access

2003: Although it does not require much effort to make information about indexing systems available and there are no specific technical requirements, this is an area in which catalogues proved to be most deficient. Of 152 OPACs

⁶ The list of Italian OPACs is available on the Italian Library Association website <<http://www.aib.it/aib/lis/opac1.htm>>

⁷ Complete OPAC semantic surveys results are available at <<http://mate.unipv.it/biblio/sem/risultati.htm>>

surveyed, 136 (90.7%) did not provide any indication on the subject heading systems or classification used to index the collection. There was no information found on thesaurus use. All of the catalogues surveyed offered search fields for subject heading systems and classification as if these were the only options available. More importantly, even for these two most frequent indexing systems, OPAC interfaces lacked information or suggestions on how to search.

2008: Of 147 OPACs, 130 (88.4%) do not supply any information on the identity or nature of the subject indexing systems in use.

B. Subject Access through subject headings

2003: Subject headings were not equally present in all searching options: subject headings were offered in 75% of the index browsing options, in 85% of simple search-by-field options and in 33.3% of advanced search-by-field options. Whenever subject headings were offered through an advanced search-by-field option, they were also present in a simple search-by-field option. The results also showed that searching for terms in a subject field would retrieve all records containing search terms irrespective of their position within the field.

It should be noted that no OPACs offered *two-step searching* whereby a user, upon launching the initial search, would be presented not with an endless list of records, but rather with an option to refine his/her search through relevant and meaningfully organized subject expressions (Fabrizzi, 2000). This two-step approach, strongly recommended by GRIS, will be discussed further in this paper.

2008: The survey repeated five years later showed little change in the rate of subject headings use. Statistics on two-step searching, however, showed that under the influence of the report from the first phase of the *Opac semantici* project, a provincial union catalogue attempted an implementation of such an approach. Moreover, an informal investigation outside of the main survey showed that, ten OPACs using the same library system software also offered the two-step searching option.

C. Subject access through classmark

2003: In principle the option to search by classmark is offered less frequently than searching by subject heading. It is present in 54% of the index browsing option, in 51% of simple field searching and 23.2% of advanced field

searching. The presence of classmark searching in the advanced field, while the same, is lacking in simple field searching and is present in only 20 out of 35 cases.

2008: In the period following the last survey, access to classmark in an index browsing option has slightly improved and was reported to be 57.5% compared to 54% in 2003. The rest of functions remained largely unchanged.

D Visualisation of subject browsing

2003: The possibility to browse a list of single words taken from the subject field is offered in 41 catalogues (27%). In addition, 112 (73.7%) of OPACs would offer subject browsing only if the term searched was in the initial position of the subject string. Only 25.7% of catalogues offer subject browsing even if the term occupies other positions in the subject string. When it comes to classification browsing, it is significant that catalogues very rarely display a verbal description of the classmark, i.e. caption (only 16%).

In spite of their importance for subject searching, syntactic and semantic relationships are very rarely shown or visualized in the subject browsing lists: only 6 catalogues link the word sought to subject heading strings containing it, 11 display semantic relationships as links (synonymous terms, broader/narrower or related concepts) and 4 provide cross-references between subject strings.

2008: The option to view and browse the single word subject list has improved and from being present in 27% of OPACs in 2003 it was found in 37.9% five years later. This is so, however, only for subject list browsing in which sought terms are in initial positions of subject expressions. The number of OPACs offering subject term browsing by words positioned elsewhere in subject expressions decreased to 14.6%.

With respect to semantic and syntactic relationships, visualized through hyperlinks, there were no significant changes. The only noticeable improvement was in subject string to subject string relationships which is an option that has become present in 11.6%, as opposed to 2.2% in 2003.

E. Visualization in record display

2003: Subject data does not appear frequently in a summary result display following a catalogue search. A summary result display, i.e. the list of hits, often contains parts of the formal document description (author, title,

date). Subject data can usually be found in a more detailed or full record display. Subject headings strings were present in 78.9% of full record displays, classmarks in 73%; the verbal equivalent of the classmark was only present in 28.5% of the catalogue surveyed. More importantly, every subject heading, thesaurus term or classmark in the catalogue records displayed were hyperlinked, thus allowing users to look up and retrieve all other documents in the collection indexed by the same term.

2008: The follow up survey showed that the presence of subject data in the summary result display decreased even further. At the same time, the presence of subject data in the full record display increased: for subject headings from 78.9% to 81.5%; for classmarks from 73% to 74.5% and for presence of class description next to the classmark from 28.5% to 38.6%. With respect to navigability, it should be noted that all subject terms have improved (subject headings, thesaurus descriptors and classmarks). The improvement was most significant with respect to verbal equivalents to the classmark in which the presence of hyperlinks increased from 0.7 to 13.9%.

2.2. Discussion

We found that the data collected in two surveys is both interesting and useful if we want to analyse and gain more knowledge about OPACs' functions in order to plan and improve this important service in the future. Hence our findings are not of concern to librarians only, but more importantly they can be used as a means of collaboration between system librarians and subject specialists in addressing the delicate issues of satisfying the information needs of OPAC users.

In comparing the two OPAC surveys it could be said that in spite of a slight improvement, Italian OPACs still leave a lot to be desired with respect to subject searching. The research shows that over a span of five years, many Italian OPACs have moved to a new interface either because they migrated to a new library system or became part of a library network and made their records available through union catalogues. These changes, motivated by strategic or administrative reasons, may have a direct impact on the OPAC functions provided. In some cases they lead to a slight improvement, in others they caused further loss of subject data and weakening of subject access.

Similar studies conducted in other European (Crawford, Thom & Powles, 1993; Ihadjadene, 1998) and North-American countries (Piascik, 1993) indicated the same problems with subject access identified by the *Opac semantici* research in Italy and show that the problems in subject searching are widespread.

With respect to *Opac semantici* research we would like highlight some findings that we find very indicative for the area of subject access.

It appeared that *information on subject access* which scored extremely poorly across OPACs in both surveys, actually improved slightly over the five year period. There is no reason or justification for the absence of this information, and this is not an OPAC issue specifically but rather an issue to be resolved as individual library policy on user services.

Another anomaly that does not require much effort to correct is the absence of subject data from *summary result displays*. Upon launching a search users may be confronted with a large set of hits i.e. a *summary record display* that can span several pages. The lack of subject data from this display creates problems because: a) records cannot be re-ordered by subject on the display screen, b) a selection of relevant records have to be made based on the title or author's name and not on the actual documents' content. Unfortunately the presence of subject data in summary result displays further decreased from 2003 to 2008.

Overall, as could have been expected, subject headings scored better as opposed to classmarks, although a very slight improvement in classmark presence was noticed in 2008. The fact that subject headings are offered frequently in both simple and in advance searching by field option and in index browsing, indicated that subject headings are considered to be more important. Term index viewing, browsing and navigation through relationships (hierarchical, associative), was particularly poorly supported across all vocabularies and throughout the period covered by the two surveys.

It should be stressed that problems noticed when searching, browsing and displaying of subject heading systems and classmarks are much more serious as their resolution resides, not in library catalogue service policy or even OPAC interface technology, as much as in the appropriate management of subject data through authority control.

One of such problems is the fact that terms that were not in the initial position of a subject string would be excluded from browsing or searching, which affects both recall and precision in information retrieval. Another problem is an inability of OPACs to support fully two-step searching which would help users to disambiguate, re-direct, narrow or expand their initial query through the selection of relevant controlled index terms. These are some of prominent issues noticed by the *Opac semantici* research group and in the following section we would like to explain them in more detail and put forward some arguments and suggestions for their resolution.

3. Two steps into the catalogue

We would like to make some specific considerations on the *two-step subject search*, which we have already mentioned previously, because it may be an useful example to define a general evaluation criterion of OPACs. This searching method is also a fundamental element of the binary structure underlying the "Italian version" of the analytico-synthetic model, proposed by Pino Buizza (2009).

Guidelines for Online Public Access Catalogue (OPAC) Displays, an IFLA document which in our opinion should be more considered by its audience ("librarians charged with customizing OPAC software and vendors and producers of this software"⁸), at least in Italy, specify that "OPAC displays must be designed to serve the functions of the catalogue, and, ultimately, to address the information needs of library users"⁹. Therefore, when evaluating an OPAC, we have to focus on the functions of the catalogue.

According to the *Statement of International Cataloguing Principles*, the catalogue should be an instrument that enables a user to *find*, in a collection, a single resource or sets of resources that correspond to the user's stated criteria; to *identify* an entity; to *select* a bibliographic resource that meets the user's needs; to *acquire* or *obtain* access to an item described; to *navigate* within a catalogue and beyond. In order to find a single resource or, more importantly, to collocate the bibliographic records for sets of resources that share common characteristics that correspond to the user's stated criteria, controlled access points should be provided, to obtain the consistency needed to find sets of resources.

⁸ Guidelines for Online Public Access Catalogue (OPAC) Displays, quot., p. 9

⁹ Guidelines for Online Public Access Catalogue (OPAC) Displays, quot., p. 11

In the two-step subject search, at the first step, the user launches his freely chosen search terms and receives a first response by the retrieval system: a list of controlled indexing terms that may match his query. At the second step, the user selects the more relevant terms from the list of controlled terms and, for each of these terms, he obtains a display with the list of all subject strings where that term is included.

According to the above-cited procedure, the two entities of pre-coordinated indexing are pointed out as they are represented, that is:

- at the first step, the indexing language basic units, the *controlled indexing terms*, either representing a concept or referring to an individually-named entity with uniqueness and unity;
- at the second step, the *subject strings*, representing the base themes of works in indexed documents.

In the two-step search the relationship between the two entities is also represented, that is, subject strings are composed of indexing terms that are syntactically coordinated in a linguistic expression that globally represents the base theme of one or more indexed documents.

Now the user can choose the most relevant theme, or themes, according to his interest with a high grade of precision, in order to finally display the list of bibliographic records for documents indexed with selected string. This way, the subject relationship between themes and works is clearly expressed.

At every step of the search, the entities and relationships of subject indexing, expressed to users, fulfill the functions of the catalogue, insofar as these are a representation of user needs.

In particular:

- at the first step, the indexing terms, which express the user's search expression in the controlled language of the catalogue, fulfill the *find* function, and they are particularly necessary for the collocative function of the catalogue;
- at the second step, the display of subject strings including the term chosen at the first step, supports the *select* function, because it allows choosing the most appropriate subject string in the list, as to achieve the related bibliographic records. The pre-coordinated subject strings in the GRIS method and *Nuovo soggettario* system are particularly effective for this function, because they are complex but understandable expressions of the entire subject content of the work.

It is important to stress that the relevance of the two-step search, as applied to the conceptual model underlying the Italian system, consists in its making subject indexing entities and relationships explicit to users, rather than in actual implementing modalities, for which advanced software solutions can also be used¹⁰. An equivalent mode has been used in printed permuted subject indexes for a long time, in which a subject string is entered in the index repeatedly under each indexing term that makes up the string itself¹¹.

Our previous considerations on the two-step subject search can be generalized to define a standard for all searches of entire sets of resources that correspond to the user's stated criteria in OPACs, therefore not only for subject search. Entities and relationships, which appear in a specific form of indexing, need always to be presented to users in a visible and understandable way. In this case, the result is that the characteristics, fundamental elements, and therefore all potentials of that indexing can be expressed in the process of use. On the contrary, if entities and their relationships are not clearly presented or if they are missing in the planning of displays and searches, cataloguing loses effectiveness, and the work of cataloguers is actually wasted at least in part, which is bad both for the library economy and for users. The inadequacy of the catalogue interface can easily result in a hindrance to the catalogue's ability to communicate the language of the library: the catalogue will not be able to support users in querying on one hand and it will prevent the library from giving precise answers on the other.

4. HiFi data recordings

The two-step subject search was introduced into the OPAC evaluation checklist of *Opac semantici* project because it is perfectly consistent with the characteristics of the new indexing method and system developed in Italy.

As mentioned previously (cf. section 2.1: B Subject access through subject headings), according to the 2003 survey there were no OPACs supporting this type of search; in the 2008 survey, it is supported by one library system software, which was found in a provincial union catalogue. What are the reasons for this gap between the characteristics and requirements of subject indexing and the situation of online catalogue interfaces?

¹⁰ The two-step subject search is not a novelty: in Italy it was recommended for the catalog of Servizio Bibliotecario Nazionale in 1985 (Bilancio di un lavoro di ricerca, 1985).

¹¹ An example of printed subject string index can be found in *Rassegna bibliografica infanzia e adolescenza*, 2000

A first answer is that, in Italian libraries, the implementation of the new indexing method is largely tied to the *Nuovo soggettoario* system, developed only recently by Biblioteca nazionale centrale di Firenze (Nuovo Soggettoario, 2007). Due to the spread of the new indexing method, the available software applications for two-step searching may possibly increase; but here we want to focus on two further conditions for effective application of the *Nuovo soggettoario* system in Italian catalogues: correct data recordings and authority control.

In order to offer users subject searches that express the entities involved in indexing, linguistic expressions, which represent those entities, must be properly recorded in bibliographic and authority records: language basic units (indexing controlled terms) must be duly identified in the database.

To be able to search and retrieve indexing terms, they must be divided from other elements in subject strings: in fact, the new indexing language envisages additional elements, that is, the *connectives*: prepositions, locutions and conjunctions, which may be necessary in the subject string to link two consequential indexing terms together. For example, in the subject string **Natalità – Effetti delle Politiche sociali** (in English: Birth-rate – Effects of Social Policy) the connective ‘delle’, between the terms **Effetti** and **Politiche sociali**, explains the logical relationship between the two concepts.

Therefore, two elements must be identified in subject strings for data recording: controlled indexing terms and additional non-controlled elements. But, at present, data recording options, offered by bibliographic formats, do not generally allow proper recording. This is due to the fact that data recording formats and cataloguing software are designed to support the traditional subject heading structure which consists of the main subject heading and its sub-headings. In this way, the various parts of a traditional subject heading may correspond to indexing terms (for instance a simple term as **Città**, or a compound term like **Commercio internazionale**), but often this may not be the case. For example, in a traditional subject heading such as **Donna nella letteratura drammatica inglese** (in English: Woman dramatic English literature) two concepts are represented and syntactically coordinated, but not individually recorded, whereas, *Nuovo soggettoario* envisages individual recording of each concept by means of distinct indexing terms **Donne** and **Letteratura drammatica inglese**.

If an OPAC permits the two-step subject searching, but indexing terms are not correctly recorded, the indexing language effectiveness is significantly reduced, because the user will not have an exclusive list of controlled terms available but rather a list of compound expressions, that in some cases do not match indexing terms. In such a list a concept may be present more than once in different contexts. For this reason, at the second step, the retrieval system will not be able to present to the user all pertinent subject strings containing a particular concept.

Correct data recording is the necessary requirement for effective authority control, that should translate into the catalogue environment, all the equivalence, the hierarchical and associative relationships of a vocabulary, as expected by GRIS and *Nuovo soggettario*¹². The opportunity to display the established relationships among indexing terms at the first step of the two-step search increases effectiveness to a large extent. With respect to this, the backwardness of Italian catalogues becomes clear. It dates back to the early automation period when it was in fact decided, in a rather short-sighted way, that cross references, which were regularly recorded in card catalogue, could be dismissed. With authority control becoming a common practice we are now in a better position to improve subject vocabulary representation and control and raise OPAC performance to a more desirable level.

5. Conclusion

In spite of the Internet's advanced information finding solutions such as Google, a library catalogue with its syndetic structure and systematic organization represent an important high quality information discovery tool whose role and potentials in information organization cannot be disputed. And in spite of the fact some people are of the opinion that a catalogue is an obsolete instrument and there are even suggestions that subject indexing should be abandoned, the central position of subject searching in catalogues appears to be very strong and impossible to ignore.

In Italy, the idea of giving up on subject access was never seriously taken into consideration. On the contrary, there were many positive attitudes towards subject indexing, especially recently, following the publication of the 22nd Edition of Dewey Decimal Classification, but even more so after *Nuovo soggettario* was made available after a long period of preparation.

¹² See a case study regarding Teca, archive for catalogue data in CDS-ISIS (Fabbrizzi, 2000)

Concerned with user needs, the *Opac semantici* project has demonstrated that our catalogues are, in metaphorical terms, aphasic. Because of the shortcomings in interface design, OPACs are either able to give an answer but cannot 'understand' the query and although they are 'able to talk' they cannot actually express and communicate information on their content. The inadequacy of the interface can easily prevent a catalogue from communicating with its structured and controlled library language. On one hand, an inadequate interface is not able to support users in querying the collection, on the other it prevents a library from giving accurate and precise answers about its holdings.

In our considerations on subject searching, we focused on the two-step approach. Because of its making subject indexing entities and relationships explicit to users, two-step subject search is an example to define a general criterion in catalogue interface design to make OPACs more responsive to user needs.

If, however, OPAC supports two-step searching, but indexing terms are not entered into the system in an appropriate way, the efficiency of the indexing language will be hindered at the very first stage of searching.

It is, therefore, important to stress that exact and detailed recording of the indexing terminology is a prerequisite for true authority control which requires a translation into machine readable format of the catalogue all the hierarchical, equivalence and associative relationships that exist in the GRIS and *Nuovo soggettario* vocabulary.

At present, the greatest weakness of the subject indexes in catalogues lays in the area of authority control. It is important to pay more attention and put more effort into the very first stage of vocabulary data entry as "an authority system is an environment in which an infection carries a greater risk of becoming an epidemic" (Buizza, 2008).

The current trend in the development of bibliographic models and standards, in particular FRSAD (Functional Requirements for Subject Authority Data) and RDA (Resource Description and Access)¹³, as well as the inevitable technology-driven evolution of the OPAC interface, show that library catalogues are about to enter a new phase. This will lead to a greater understanding of the usability of semantic linking of the bibliographic data contained in knowledge organization systems.

13 RDA website <<http://www.rda-jsc.org/rda.html>>

It is evident that library catalogues need to be improved. From the work undertaken by GRIS and *Opac semantici* it transpires that there is a clear understanding of what needs to be done and that Italian librarians have the required expertise to embrace the opportunity to improve their catalogues.

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