Facilitating the Interaction of User and Public Knowledge Organization With User Profiles, User Views and User Education Plans

Abstract: This paper presents a new approach to bibliographic instruction which incorporates evaluation of the users' needs. The model proposed creates a User Profile based on the depth of knowledge, subject area expertise, and information task of the population to receive instruction. The model uses this User Profile to posit a User View, an idealized "target" information pool which closely approximates the informational needs of the user. It then creates a heuristic search strategy and user education plan (UEP) based on this view. Suggested approaches to the application of this model and an example are provided.

1. The Problem

Reference librarians are not only the gatekeepers for access to online public knowledge organizations, they are also, more often than not, called upon to be the first line of instruction in their use. They find themselves instructing several different categories of users, with different levels of education, divergent needs, and various levels of computer literacy, on how to locate, access, and search the appropriate online resources. Some of this instruction is occurring in semi-formal and classroom situations, and many reference librarians, because they have often not received formal teacher training, are ill-equipped to deliver the right kind of information to the specific and varied audiences they must deal with. Even if the modern reference librarian has mastered the knowledge of on-line public knowledge resources and their software interfaces, the question remains, can he or she communicate that knowledge in an appropriate instructional package, to the user?

2. An Illustration

To illustrate the problem, let's take a look at a real (and perhaps all too typical) example of a failure to deliver appropriate instruction. In the following scenario the librarian did not take the user or user group into appropriate account when she conducted a training session. As a result, she failed to meet any of the user's needs and expectations.

Bibliographic instruction (BI) was presented to upper-level undergraduate nursing students. The bibliographic instructor, who was a senior reference librarian, had only 45 minutes to demonstrate how to search the electronic database CINAHL by OVID. OVID has two search modes: easy and full, the former operates with one function tool bar and the latter operates with two function tool bars. The bibliographic instructor did not conduct a reference interview with the nursing professor responsible for the class prior to the instruction, so she selected the example nursing topics at random, none were related to this particular course.

For the presentation, the librarian provided an in-depth explanation of every function of the database, for both easy and full mode. She then proceeded to demonstrate how to search in both modes, using two different nursing topics, both, as was mentioned previously, irrelevant to the course the students were taking. The students were then given an assignment,
but no student was able to complete it due to the confusion caused by the presentation. As a result, the students were overcome with anxiety because they could not complete the assignment and did not learn how to search the database for relevant topics. They left the instruction session with a negative attitude toward using the database, not to mention the library. A survey given at the end of the session also indicated that they did not feel comfortable approaching the librarian for further instruction. All in all, a deplorable situation.

3. Delivering the Informational Goods: User Profile and User View

Obviously the instructor failed to "deliver the informational goods" to the students. What went wrong? In a typical academic reference setting there are likely to be many different categories of information user. They may vary along several dimensions.

One dimension is depth of knowledge in subject area. Some users will be novices in their subject area, others will be more knowledgeable, and yet others will have a detailed knowledge of their subject matter. It is possible to develop a simple classification scheme for user types, which could be further refined in an actual application setting. This classification is based on domain knowledge:

A = General Users
superficial to nonexistent knowledge of domain, no knowledge of special vocabulary (terminology) of the domain

B = Intermediate Users
general domain knowledge, with intermediate familiarity with the terminology of the domain

C = Expert Users
high level of domain knowledge with a high degree of familiarity with the terminology of the domain including sophisticated concept relationships

Another dimension, which may intersect variably with subject area expertise, is extent of computer literacy. The user with the greatest depth of knowledge in his/her subject area may or may not be the most knowledgeable computer user. We can classify such users as follows:

1 = Novices
low level of experience with computers in general, little or no experience with searching and concepts of searching.

2 = Intermediates
some familiarity with computer operations; modest experience with searching and search concepts, e.g., keywords, etc.

3 = Experienced
high level of familiarity with computers and different software interfaces; significant experience with different types of searching and with advanced search concepts such as limiters, boolean operators, etc.

Further, each user is seeking reference assistance because of a particular information task they are trying to carry out. The information task dimension includes subject area, topic, type
of assignment, purpose of search relative to assignment, and so on. A simple classification scheme for information task might include:

\( a \) = simple (non-specific or general task)

task can be fulfilled with non scholarly materials, e.g., undergraduate term paper on relatively broad topic not requiring in depth knowledge of subject area; general information in domain with broad scope, shallow depth. relevance factor: high recall/low precision

\( b \) = semi-complex

task can be fulfilled with mixture of scholarly and non scholarly materials, e.g., honors thesis or senior research paper; greater depth of search, scope is more focused. relevance factor: variable

\( c \) = complex

task can only be fulfilled with scholarly and research material, e.g., theses, dissertations and faculty research; searches of greatest conceptual depth and scope is highly focused. relevance factor: low recall/high precision

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**SUBJECT AREA**

- GENERAL
- INTERMEDIATE
- EXPERT

**COMPUTER LITERACY**

- NOVICE
- INTERMEDIATE
- EXPERIENCED

**NATURE OF TASK**

- SIMPLE
- SEMI-COMPLEX
- COMPLEX

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**Fig. 1: Components of the User Profile**

The combination of subject area preparation, computer literacy and specific information retrieval task creates a profile for each user. This user profile can be used to determine both what a user should need to access from an online resource and the most appropriate methods for accessing it. One of the most significant failures of our hapless bibliographic instructor was that she failed to make any attempt to develop a profile of her user audience. She had no sense of their topic (outside of the fact it was "nursing"), how much they knew about the topic and of the demands of their particular assignment (the information retrieval task). Further, she had no sense of how much they knew (or could absorb) about the online system itself. She failed to develop a user profile and, thus, could not develop an appropriate training strategy.
Using a concept borrowed from systems analysis, we can also say that she failed to determine the particular user view of the information that was called for. In most large organizations there is a stupendous amount of information potentially available. But the engineer, the accounting clerk, and the salesperson in an automobile factory, for instance, do not need access to all the information available and they do not need access to the same information. Similarly the undergraduate biology major writing a term paper, the biochemistry graduate student writing a thesis and the full professor of biochemistry researching a scholarly book, each project a different need on the total available universe of biochemistry information. Each user has a particular task to carry out, thus only a selection of the available information needs to be given to them. This user-determined window on the data is a user view.

![Diagram](image)

**Fig. 2: User View is a Projection of User Profile**

The argument we want to make is that in order to be able to deliver the information goods to a user, the librarian has to act as a kind of systems analyst. The librarian ought to determine what the most appropriate user view on any public knowledge organization is and then configure an instructional package that teaches the user how to access the information selected by that view. Our example bibliographic instructor did not create a user profile, did not project a user view, and could not, therefore, meet her student/user’s expectations for information needs with an appropriate training package.

4. **Summary of the Model**

User view is determined by several factors which arise from the user profile. These factors include, most importantly:

- the nature of the particular information task-at-hand (subject area/topic, depth and scope of information required, purpose of search, etc.)
- depth of knowledge of the subject (domain knowledge) including, particularly, knowledge of the special vocabulary (terminology) of the domain and the conceptual relationships
obtaining between them

- existing level of ability to access information, including existing knowledge of search strategy, existing patterns of information-seeking behavior, and understanding of on-line resources
- general level of computer literacy and ability to deal with and understand software interfaces

From the user profile the librarian/analyst identifies a user view. The user view is an idealized “target” information pool selected by the user profile. That is, the view is a pool of information the librarian projects will be the most appropriate pool for the user to access — given the task and its purposes, the existing level of user knowledge and the existing level of search ability. Included in the projected user view is a preliminary search strategy. This preliminary search strategy should be characterized by the following attributes:

- it is topic relevant (e.g., it should be about a topic or topics with which the student task is involved)
- it is task relevant (e.g., it should address some aspect of the task with which the students are faced)
- it is instructionally focused, (e.g., it should include those only those operations or techniques required for successful completion of the task at hand and should not try to cover all possible modes of access and searching.)
- it should utilize strategies of a scope and depth appropriate to the student levels of search ability and subject knowledge.

Once the librarian/analyst has determined a user view with its attendant heuristic search strategy then, especially in settings where, for instance, an instructor has brought a class to the library for a formal introduction to searching on-line resources, he or she must develop a user education plan (UEP). Unless the librarian intends to do the searching him or herself, the UEP is a necessary next step. The UEP is an educational package: a customized instructional set consisting of a heuristic search strategy, the instructions entailed by that strategy, and accompanying relevant explanations and examples. The entire package is derived from the user profile and its associated user view.

Summarizing the steps to the method:

- Phase 1: determine the user profile
- Phase 2: evaluate the user profile and determine a user view
- Phase 3: create a heuristic search strategy and adopt a user education plan

5. Applying the Model: Some Approaches

The model we presented can be partially implemented as a faceted classification scheme from which a series of formulaic potential user profiles can be constructed, for example: A1a, B2b, C3a etc. The formula B2b, for instance, would be an intermediate user (senior or first year graduate student) with a reasonably broad, but not very deep, knowledge of domain and its terminology, modest computer skills and experience of searching, and a semi-complex task which could be completed by accessing a mix of general and scholarly materials.

The task of the librarian as bibliographic instructor, would be to create such a faceted classification scheme as a means to identify generic profiles and user views existing in the user population he or she serves. These generic profiles could be attached to sets of prepared UEP’s,
one UEP for each identified profile. The classification scheme presented earlier allows for 27 combinations, but it is possible to sophisticate the classification. The scheme should be as detailed as the makeup of the user community demands. Clearly it is possible to create a UEP for each user and each possible topic. And, indeed, this is what we could and should do in the best of all possible worlds and if we all had an unlimited amount of time.

In the real world we are more likely to succeed with a more modest approach. The bibliographic instruction community in a particular organization should undertake a kind of "ethnography" of the user community. This ethnography should identify the number of classifications required in each category. The ethnography should identify, perhaps by frequency, the subjects and topics most often requiring bibliographic instruction. From the ethnographic information a set of base UEP's could be constructed. This base set would provide user-appropriate training for as much as 80% of routine bibliographic instruction.

It should also be possible to combine these base, pre-prepared UEP's with interviews to allow for the inclusion of profile information that is highly variable, such as the specific topic of an assignment. In most user populations certain features of the user profile will remain relatively constant over time. It should be possible for a generic profile to accurately describe the user characteristics of the "typical undergraduate English major with a moderate level of computer skill." Such a profile will remain relatively stable over a period of years, shifting only gradually. A UEP for such a user could be instituted in the nature of an open-ended training document. If stored in electronic form, a simple interview prior to the training session could be used fill in any variable data, such as the particular topic the English instructor wants this particular class to research.

Of even greater value would be a database of plans on various topics at the various classification levels stored on-line and retrievable by the BI prior to a session. Ultimately the goal should be for every bibliographic instruction session, even those with individuals, to be developed and recorded as an electronic UEP document stored in a database. Then users could gain access to the UEPs themselves and look at search strategies, explanations and examples on topics and at levels that match their own profiles.

6. An Example of a UEP linked to a User Profile

The following is a training plan, including a core search strategy, which reflects the needs of a User Profile classified as a B2b. The B2b comprises the subject area for intermediate users (B), the computer literacy intermediate level (2), and the nature of task as semi-complex (b). The B2b will be implemented for the user profile of nursing students, the example we mentioned previously. The UEP for the scenario is as follows:

The librarian consults with the nursing professor prior to the bibliographic instruction. During this interview, the librarian learns that this course is on geriatric nursing and it is the first course of the core nursing program. The librarian also discovers that the nursing professor is discussing the topic of Alzheimer's disease, and only wants her students to search for review articles from professional nursing journals.

It is from this interview with the nursing professor that the librarian determined the appropriate user profile and user view. For example, the student/user is upper division undergraduate students who have knowledge of nursing terminology, and the student/user has a specific objective when searching the CINAHL database. The only information not determined yet is the level of computer literacy. Here, the librarian can conclude that these students are upper division undergraduates who are probably familiar with using the computer, keeping in mind that this is a class instruction where some students have little or no computer skills, using the
intermediate level of computer literacy would be appropriate in this given situation.

After determining the user profile and user view, the librarian is able to create a UEP tailored to student/user need's and expectations. The librarian designs the following UEP:

- introduction of CINAHL by OVID. explaining that for this B.I. session, only the easy mode will be used, begins demonstration
- explanation of easy mode function keys and the keys relevant for this B.I.
- demonstration of the search strategy, using the 'subject' function key for the topic of Alzheimer's disease, and explanation of topic relevance to the course
- explanation of how to limit the subject to age specification, using the 'limit' function key, since the course focuses on geriatric nursing
- explanation of how to limit the topic of Alzheimer's disease in the aged to review articles, as requested by the nursing professor

After completing the UEP portion of the B.I., the librarian can explain how to retrieve the citations and where to locate the actual journal review articles. This process should be completed in 25-30 minutes. The remaining time should concentrate on allowing the student/user to use a hands-on approach and practice the search themselves. This hands-on approach allows the student/user to become familiar with the search techniques and the database. As a result, the student/user is not overwhelmed by using the computer and will begin to explore various search strategies and techniques.

The UEP scenario, designed by the librarian for a specific situation, fulfills the requirements of the user profile and user view to tailor to instruction to the needs of the user, therefore, delivering the appropriate informational goods.

7. Conclusion

Adopting the user profile, user view, user education plan model should improve the ability of the librarian or bibliographic instructor to develop a training strategy that more closely meets the needs and matches the levels of ability and subject knowledge possessed by user groups. By improving the quality of instruction, we can better provide users with the means to successfully access and retrieve the information they need from public knowledge organizations.

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