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Assessing the Provision of Networked Services: ERIC as an Example

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ABSTRACT

ERIC is an important component of the U.S. Department of Education's dissemination activity. It has been a source of innovation, and is a powerful tool that supports a range of user services. However, large-scale adoption of the Internet into the program has lead to a fragmented ERIC that finds its greatest value, service, marginalizing its biggest product, the ERIC database. This chapter examines key components of ERIC for assessment and proposes models, key questions and solutions for improving ERIC. The paper suggests that an experiential evaluation approach, combined with deductive modeling, may offer one way to redesign a program such as ERIC.

BIOGRAPHICAL SKETCH

R. David Lankes rdlankes@askeric.org works in the area of digital reference and education information. He completed his Ph.D. from Syracuse University, School of Information Studies. He is the co-founder of the AskERIC service, and principle investigator of the Gateway to Educational Materials (GEM) and the Virtual Reference Desk (VRD) projects as well as director of the ERIC Clearinghouse on Information & Technology. He has also served as a visiting scholar to Harvard's Graduate School of Education. Additional background information can be found at: http://www.askeric.org/~rdlankes.

Introduction

The Internet has had a significant impact on nearly every sector of the information industry. From e-commerce to libraries to education, the interactive capabilities of the worldwide network has changed users expectations and organizations' delivery vehicles. Yet, not all aspects of the "Internet effect" are immediately evident. Some organizations that embraced the Internet early are only now discovering the consequences.

While "early" is a relative term, this chapter will focus on Internet adoption after commercialization and popularization of the network. This can be marked at approximately 1993 with the advent of the World Wide Web and removal of commercial restrictions on Internet content and traffic. While certainly the Internet existed long before the early 1990's and had an impact on research and education, many of the impacts discussed in this chapter can only be seen in the large-scale popular adoption of the web. An example of an early adopter of the Internet is ERIC.

The paper does not attempt to provide a comprehensive literature review about ERIC, evaluation approaches in the networked environment, or key issues in the evaluation of networked services such as ERIC. Other chapters in this book do provide such background reading and will not be repeated here. Instead of a literature-based approach for considering the evaluation of ERIC, the author prefers to rely on a more experiential and deductive approach.

This chapter will examine ERIC and the impacts of Internet adoption in light of assessment. It will identify key aspects of the system that have been affected by a phenomenon known as disintermediation. It will further use post-Internet efforts such as AskERIC and the advances in metadata research to propose a solution to improve the valuable ERIC service. The paper suggests that the existing assessment models for ERIC are inappropriate and that an experiential approach, combined with a deductive model may offer some insights into how best to redesign the ERIC program.

Why ERIC

ERIC is a particularly revelatory case for examining the provision of networked services for several reasons:

- ERIC is representative of large information resource providers: While having significant funding and structural differences from services like the National Library of Medicine's MEDLINE (http://www.nlm.nih.gov/) and the National Library of Agriculture's AGRICOLA (http://www.nalusda.gov/ag98/), there are many common features. All are federally funded and part of larger national libraries (in ERIC's case the National Library of Education). Further ERIC has many similar issues with traditional information providers of bibliographic online systems.

- ERIC is government funded and an active member of an emerging market: While the majority of the ERIC creation process is funded by the U.S. Department of Education it plays a significant role in a larger education marketplace. This role can be seen in partners such as Dialog and SilverPlatter, and in standards setting activities such as the Gateway to Educational Materials (GEM) as well as popular web services such as the National Parent Information Network (NPIN) and AskERIC.

- ERIC's decentralized nature provides a rich environment of Internet services and resources: As will be discussed in this chapter, ERIC is far from a monolithic service; rather it is a series of subject experts and support components. Each of these ERIC elements has approached the Internet and networked resources in different ways.

- ERIC is at the initial stages of a large-scale evaluation: As ERIC enters into its 35th year it also enters into a two yearlong evaluation process. The first phase of the evaluation came in the form of five commissioned papers (McClure, 2000). The next phase will be a formal yearlong evaluation looking not only at ERIC's past, but setting directions for the future. As the commissioned papers have already demonstrated, the process of evaluating the system and setting direction will be no easy task.

This chapter continues that ongoing ERIC assessment as well as providing an examination of how traditional information resource providers cope with the effects of the Internet.

ERIC Background

The Education Resources Information Center (ERIC) program was founded in 1966 to capture the fugitive, or gray literature (Stonehill and Brandhorst, 1992), in the field of education. The idea was simple: make the mass of research in education easily available to the field of scholars, and scholarship will improve. ERIC set out to capture dissertations, conference proceedings, white papers, research reports, and the information that was often hard to find (later adding a mission to index and abstract relevant journals). It did so in a revolutionary way for the time. It created a decentralized system of subject specific clearinghouses to build both a digital bibliographic database (a cutting edge concept at the time) and a microfiche archive of the documents themselves.

In the intervening year ERIC has added an active publication program within the clearinghouses producing both major monographs and small synthesis pieces. The system also has a rich tradition of special projects that have resulted in a rich a varied set of research and development projects including the AskERIC service (Lankes, 1995) and the National Parent Information Network (http://www.npin.org/). In recent years ERIC has become a key player in the Internet environment with each ERIC component hosting a website and sponsoring one of the first 100 web sites and the first web presence for the U.S. Department of Education.

Assessment Background

In 1999 the ERIC program office in the U.S. Department of Education began a major system-wide evaluation of ERIC by commissioning 5 papers on different aspects of ERIC (ACCESS ERIC 2000): Mission, Structure, and Resources; The ERIC Database and Its Technical Processes; Technology and the ERIC System; ERIC User Services; and ERIC Products and Information Dissemination. The papers made a series of observations and discoveries. In some cases they recommended specific technologies, while other papers concentrated on areas for further examination. Across the papers, however, common themes emerged (Lankes, 2000), e.g., that while ERIC is a well known and successful service with much to be proud of, ERIC was far from a unified system and needed to re-evaluate its users and mission as well as its technology.

The decentralized model, however, also has caused the system to appear fractured. For instance, the clearinghouses' web sites are rich with valuable resources, but links to the ERIC system (http://www.accesseric.org) and AskERIC are not consistently provided. Nor do the web sites provide links to other clearinghouses that may have information relevant to their users' needs. At some sites a visitor would need to be persistent to find information on a clearinghouse's relationship with the central ERIC system. The visitor also may need to know of the existence of another clearinghouse to obtain relevant resources from that clearinghouse. Furthermore, the number of interfaces to the ERIC database, the large number of ERIC components, and the different look and feel of components' web sites all contribute to users' confusion over the ERIC system. More coordination is needed to give users a more coherent picture of the system. This is one of the easier tasks to enhance ERIC user services. Giving users a clear map of what the ERIC system offers and how a particular clearinghouse relates to the central system and other components will enable users to navigate the system and take full advantage of ERIC services and products. (Hsieh-Yee, 1999**)**

These themes, particularly the unambiguous call for major changes to the ERIC database and database processes then have formed the basis of a half-million dollar assessment to be conducted in 2000 and 2001. This chapter will seek to add an insider view to the commissioned papers as the assessment gets underway and build a revelatory case for other's assessing information systems adopting the Internet.

A Model for ERIC Assessment

What follows is a basic model for assessing ERIC. It can be applied to other large information resource providers. It begins by establishing a basic set of ERIC components and their relations to each other before and after large-scale adoption of the Internet. It then explores these system components in greater detail.

Figure 1 represents a simple view of the ERIC system before 1992 and wide-scale adoption of the web. The key components of the system consisted of:

- Users: ERIC users could be characterized as education researchers, librarians, education students and front-line educators.

- The Database: a coherent collection of bibliographic records managed by the ERIC Processing Facility

- Clearinghouses: a distributed set of subject experts selecting material for the database, indexing and abstracting this material for the Facility and publishing synthesis pieces based on the contents of the database.

- EDRS: The ERIC Document Reproduction Service, the document delivery service of ERIC that provides microfiche and paper copies of non-copyright documents in the database.

The key relationships of this figure are between the users and the database, the database and the Clearinghouses, and the users and the clearinghouses.

In this model the user's primary interaction with ERIC is through the database and some form of intermediation. The intermediation in this model is primarily provided by agents external to ERIC such as libraries or online database providers such as Dialog or SilverPlatter. While there is some minimal interaction directly between users and clearinghouses, this is restricted to database searches, and publication requests. In this model the primary role of the clearinghouses is to feed the database. All information is controlled and processing is centralized. To the end-user ERIC seems like a coherent system under a single database, and the user population seems to be cohesive.

Figure 1. ERIC Before Large-Scale Internet Adoption

The current large-scale evaluation of the ERIC system must be careful NOT to evaluate ERIC on this model. As will be shown, this model is no longer a valid representation of the current ERIC system. While ERIC may return to this approach, it does not currently work in this manner. One trap that the evaluation must avoid is assuming that the database still forms the basis on interactions between users and the ERIC system. Another assumption that must not be made is that the majority of intermediation between users and ERIC is done with resources external to the ERIC system (and budget). These assumptions are invalid in light of large scale Internet adoption.

Wide scale adoption of the Internet has significantly changed the model offered in Figure 1. A new model has emerged as represented in Figure 2. As clearinghouses went online, their subject expertise became increasingly available directly to end-users. End users could go directly to ERIC Clearinghouses they felt best matched their needs (so reading teachers began to identify with the Reading Clearinghouse while guidance staff began going directly to the Counseling Clearinghouse). Clearinghouses began responding directly to user needs by posting materials and creating services on the Internet. Often these services were seen as small increases in effort, and so clearinghouses mounted web-based resources with little or no

additional resources from the federal government. In the e-commerce literature this shift of access from user to intermediary to user directly to producer is called disintermediation. The rest of this chapter deals with the impact of a disintermediated ERIC system.
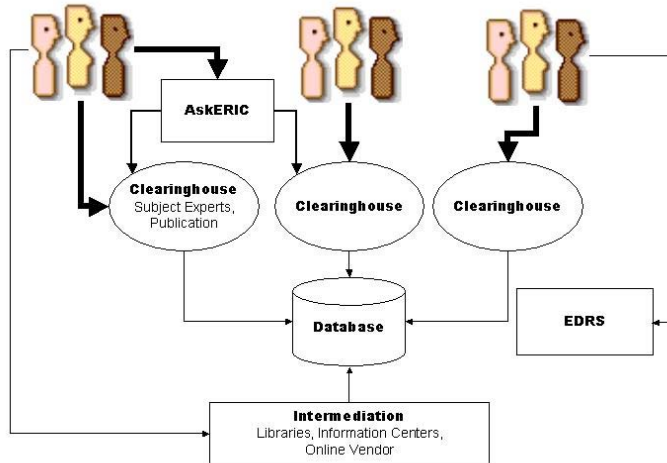

Figure 2 Post-Internet Adoption ERIC

Components of ERIC for Assessment

As previously mentioned there are four key components that must be considered in an assessment of the ERIC system:

- Users

- Database

- The Clearinghouses, and

- EDRS.

In this model, however, a new element is added: AskERIC. AskERIC began as a special project of the ERIC Clearinghouse on Information & Technology, but has grown to a system-wide effort involving every clearinghouse and ERIC component. AskERIC consists of a web site with practioner-oriented resources such as lesson plans, pointers and response archives, and a digital reference service that takes end-user questions and provides expert answers including ERIC database searches and relevant Internet cites and non-Internet resources.

AskERIC is a significant new component in that:

- It is the first ERIC service born after Internet adoption,

- It has attracted large scale use often from users that know nothing about the larger ERIC system (3 million web hits per month and over 1,400 question per week at peak use)

- It involves all of the ERIC clearinghouses, and

- It does not directly feed the database function.

The author will examine the impacts of Internet adoption and subsequent disintermediation in each of these components.

<p align="center">Users</p>

ERIC began its mission to disseminate education research primarily to education researchers. Over the years this mission was significantly expanded to reach front-line educators such as in-classroom teachers, school librarians and faculty. It has also been expanded to encompass parents and special rural and urban populations. In the pre-Internet adoption model this population, while wide, could still be considered somewhat cohesive. It could be sampled, trained and changes in the ERIC database impacted all user segments equally.

However, considering ERIC users before Internet adoption could be seen as a bit misleading. ERIC's primary users were intermediaries and information organizations that repackaged ERIC for the eventual end-user. Microfiche was produced for libraries. Computer tapes were produced for external organizations, such as universities and online database vendors, to incorporate into their own unique products. The first ERIC produced interface to the database did not happen until nearly 1994. To date there are no controls placed on interface and database manipulation on the part of third party vendors such as SilverPlatter.

This disconnect between end-users and ERIC had some advantages. Accessibility and technical development for example were not concerns of the ERIC system. Third parties handled database technologies and connectivity of end-users to ERIC with little or no cost to the government. With the Internet this disconnect with users is gone. However, as ERIC has taken a greater role in providing direct intermediation resource issues have become obvious. Clearinghouses have discovered that mounting an adequate web presence to meet user needs and expectations is a significant new cost from pre-Internet

adoption. ERIC has absorbed the work of direct user service without the resources being expended by the previous third-parties. Further, the once coherent user population has fragmented based on subject expertise. Parents may be a major user of one clearinghouse, but not another. The ERIC system is losing its ability to talk about ERIC users, and must now talk about Clearinghouse constituencies. Users of one clearinghouse are often completely ignorant of other ERIC resources.

The ERIC assessment in terms of users must question:

- What are the individual constituencies of each ERIC component (clearinghouses, the ERIC database, EDRS)?

- What is the overlap of these constituencies?

- What impact would limiting these constituencies have on each individual component?

- What is the extent of current and predicted demand on clearinghouse intermediation efforts (Internet services)?

These are all key evaluation questions whose answers are not obvious without a formal ongoing assessment program.

<center>Database</center>

The database lies at the heart of ERIC. While Clearinghouses have become publishers, reference centers, trainers, and web designers, they still feed from (and to) the database. Furthermore, much of the system-wide approach and history stems from database building, therefore making the database a core element of assessment.

The ERIC database can be seen as having four functions:

- Archive: A collection of objects (cataloging records, and digests) that represent the field of education at a given point in time. While one can argue how complete this representation is, it is nonetheless a view of the past. Extensive cataloging acts as a historical record of a document's existence. In this capacity it is not responsible for locating the article, merely marking its existence at a point in time (when it was entered into the database). It is also in

this capacity that the database serves educational researchers asking the question "where have we been."

- Institutional Memory: Strongly related to the concept of archive is that of institutional memory. In a sense the database represents the collective memory of the ERIC system. From the inclusion of ERIC publications and manuals, to implied selection criteria, the database documents ERIC and its changes. This role can be extended to the Department of Education in the system's attempts to capture the publications of the entire department.

- Research/Reference Aid: Possibly the largest use of the database is as a reference aid. Users access the database to find information to be applied to a given circumstance. In this way, the database is merely a finding aid for original documents such as articles or monographs. It is in this capacity that the database serves users asking, "where can I find something?"

- Decision support: Strongly related to the concept of reference aid is that of decision support system. While information purists may find fault, the truth is a large percentage of users come to the database as a means of supporting action on its own. That is, users aren't looking for the cataloged document, but rather use the abstracts and document resumes as documents in and of themselves. Examples of this function might include researchers conducting a literature review, or a teacher looking to support technology plans.

All of these roles must be considered as part of an ERIC evaluation. In a disintermediated ERIC all of these roles have been significantly affected by the web environment, resulting in an increasingly marginalized database. The key to this marganilization is the print-orientation of the database. Even web materials entered into the database are printed and processed. While this made sense for archiving the gray literature of the past, today an increasing amount of the information to be captured is electronic only. This problem is further compounded by the fact that ERIC Clearinghouses are now producing electronic and non-print resources that cannot be processed into the database. The bottom line is that while the clearinghouses have changed their materials and service to better meet user needs through the Internet, the database has not made any significant changes in light of the World Wide Web.

Clearinghouses

The Internet has signified the dawn of the clearinghouse. While each clearinghouse was always given room for individual innovation and always had some contact with end-users, the Internet has raised the visibility and access by at least an order of magnitude. Each Clearinghouse has its own website and a series of web services aimed at unique constituencies. Since these websites and services grew around (and often to circumvent) established quality and consistency standards geared towards the ERIC database, there is very little consistency from clearinghouse to clearinghouse. For example, three of the clearinghouses mount their own versions of the ERIC database. While most clearinghouses mount short synthesis products, some mount larger synthesis pieces as well. Some clearinghouses have even created full-text collection of documents in their subject area separate from the database.

In many ways the ERIC system has become the ERIC database and a series of semi-autonomous clearinghouses. Each clearinghouse has established partnerships with industry, user associations and other organization with little to no consultation with the other ERIC components. These partnerships have been driven, as mentioned earlier, by a need for resources to support direct user intermediation. It has also lead to fragmentation in mission, vision and certainly operations. These differences are becoming evident as the system wrestles with re-designing the ERIC database, and system as a whole.

Further, clearinghouses have become more loyal to their individual constituencies than to the database. This is understandable for two linked reasons: ERIC has always been oriented to serving users and clearinghouses see the database as increasingly unable to meet user needs on its own. In a disintermediated environment clearinghouses have moved faster in response to rising user expectations. They also feel that they have a more direct sense of what users want since they have closer interaction to end-users. This is not to say that clearinghouses have abandoned the database. All still see the value of the database, work hard to keep it up to date, and are dedicated to its improvement. It is simply that many clearinghouses are unwilling to wait for changes to the database when they have direct control over their own websites and Internet activities. This increased control leads to increased ownership, and increased attention. This has always been true of clearinghouse publications and user services s well.

The biggest impact on EDRS with the large scale adoption of the Internet was the introduction of full-text electronic delivery of ERIC materials. Since ERIC is still a primarily document-based system, document delivery is essential. Pre-Internet document delivery was done through microfiche and paper. The Internet has now brought document delivery of Adobe Acrobat files through the World Wide Web. However, this service provides an excellent example of ERIC caught in two worlds.

Currently non-copyright documents are sent to EDRS where they are photographed for microfiche. These microfiche are then scanned as an image into TIFF files that are then converted to PDF files for delivery. The digital files that are sent are images of text, not actual text. This makes the files large, and at best, inconvenient for manipulation. Also, as these electronic documents were created from fiche, not the original document, they wary widely in reproduction quality and lack simple advantages of digital documents such as color. Adoption of full-text has been slow, but is increasing. The first roll-outs have been geared at traditional ERIC clients, namely academic libraries, and so marketing and systems to reach in-classroom educators have been limited.

Key questions for an evaluation of ERIC in terms of EDRS include:

- Is fiche still needed?

- If fiche is needed for archival purposes, does it need to be distributed or can it simply become a

  centralized fiche repository?

- Can the full-text process be improved?

- How can EDRS better handle born-digital documents to speed processing and improve quality?

Once again, answers to these questions will require a careful and ongoing program or assessment.

AskERIC

As previously stated, using the pre-Internet model of ERIC for an evaluation is problematic at best. Aside from ignoring the disintermediation effect, it misses nearly all of ERIC's response to the Internet. The largest scale system-wide response has been the creation and institutionalization of AskERIC. While the service began as a special project of one clearinghouse, it is now part of every clearinghouse contract.

AskERIC, in light of this discussion can be seen as a model of a post-Internet adoption ERIC. It involves components system-wide not only in answering questions, but in creation of policy and quality criteria. While it provides a central door to the AskERIC service, each clearinghouse can provide their own access and interface. Some clearinghouses, for example, point directly to AskERIC from their web sites; some point to parts of AskERIC such as a question entry form. Some ERIC projects repackage the AskERIC service, such as the National Parent Information Network that uses AskERIC as part of its service called "Parents AskERIC."

AskERIC must be considered in an assessment of ERIC. AskEric also points at elements that should be part of any ERIC redesign. Namely:

- A distributed, solution that can be repackaged for specific audiences,

- A system-wide solution that builds on the unique subject-level expertise of the clearinghouses,

- An Internet-based solution that provides the best of the existing ERIC database, but also materials of direct use to practioners,

- Personalized service controlled by the ERIC system itself.

These components have had a significant impact on the operation of ERIC, overall, and have evolved, in part, because of the evolution and development of the web-based environment.

A Proposed Solution: The ERIC Knowledgebase

So where does the disintermediated ERIC system go from here? Two extreme solutions would be to allow the Clearinghouses to continue on their road to autonomy and manage them much as the Education Laboratories (http://www.ed.gov/prog_info/Labs/) run out of the Department of Education now. Each

clearinghouse would be given its own audiences, products and oversight. This approach would require a great deal of oversight on the part of the federal government and would loose the strength of diverse expertise and organizations working together in a comprehensive education dissemination effort.

The opposite extreme would be to corral the clearinghouses into a new version of the pre-Internet model. Clearinghouse expertise would contribute to a new ERIC portal, a single ERIC web presence that provided a single interface to ERIC information, print and otherwise. Perhaps the ERIC web-space (a term the author uses to refer to ERIC created/housed information that exists solely on the web), could be folded into the existing AskERIC service, or system wide website run out of ACCESS ERIC. Both of these approaches seem to sacrifice too much. The question becomes how to preserve to strengths of clearinghouse identity an audience linkage while avoiding a confusing maze of disconnected websites.

The Emerging ERIC Knowledgebase

Clearly, a major shift must occur to bring these different information systems, database, web-space and digital reference services into alignment. While this may ultimately lead to a larger price tag for ERIC, the Federal Government will be assured that their investment makes maximum use of allocated resources.

The author argues that the coordination of ERIC systems comes in the form of an ERIC Knowledgebase. This knowledgebase can act as a framework for evaluation (to see how close ERIC comes currently) and a vision for strategic planning. The proposed ERIC Knowledgebase would be a multifaceted information system. It would rely on standard metadata and data interchange standards to create an electronic repository of digital objects (full-text articles, software, lesson plans, etc.), object references (to existing fiche, journal articles, non-ERIC websites, or other items not stored within ERIC), and services (such as digital reference assistance). ERIC's main purpose would be to add data to the knowledgebase through its distributed system of clearinghouses and wider network of partners including authors of education related materials. The knowledgebase itself would be distributed throughout ERIC components, but act as a unified collection with multiple, user-specific interfaces.

Contents of the Knowledgebase

The Knowledgebase would consist of the current ERIC Database, however it would directly link bibliographic records to their full text counterparts if they existed in electronic form. In addition to the current bibliographic records, all the contents of the ERIC web-space would be cataloged and harvested to be part of the knowledgebase. Once again, metadata from the web-space would be directly linked to actual items (web pages, software, etc) where possible. Where an ERIC component could secure proper rights, the actual binary objects indexed would be included in the knowledgebase as well, thereby creating a digital archive. Lastly the knowledgebase would store profiles of subject experts currently available through AskERIC. These profiles could be searched and used to ask questions from within the knowledgebase. The resulting question/answer sets might also be stored in the knowledgebase (assuming privacy issues are resolved).

Facets of the Knowledgebase

The knowledgebase will incorporate a series of facets that will be used to filter information for a given audience and/or interface. For example, instead of a single definition of quality, item quality will vary according to audience and information use. For example, currently ERIC document resumes go through at least two phases of editing before they are entered into the database (one at a clearinghouse, the second at the ERIC Facility). This two-step process minimizes typographical and other errors. However, this process also slows the entry of current information into the database. Many clearinghouses have taken to create a "pre-release" website that list in-process database items. These would be directly entered into the ERIC knowledgebase and tagged as "in-process" records. Searchers worried about data quality could filter these records out. Over time, with proper training and software, the second level of editing could become redundant, thereby speeding up database building activities.

Another facet represented in the knowledgebase would be duration. With the simple addition of document lifespan the ERIC Knowledgebase could become dynamic. Items could be entered into the knowledgebase knowing they will not be archived (therefore needing to meet a to a different set of quality criteria). These items (such as conference announcements) could be automatically weeded from the knowledgebase, or brought up for review on a schedule. Further, items with shorter life spans would be subject to a lower

level of indexing effort. This notion of cataloging depth then becomes yet another facet for the knowledgebase. Some documents could have very brief metadata records associated with them (say a title, and short abstract), while other items may have metadata resembling current ERIC document resumes.

A last facet needed in the ERIC Knowledgebase is that of cataloging intelligence. Here, a record indicates whether or not a human cataloger created a metadata description. This would allow for the use of automated harvesting of information. Such automation would dramatically increase the amount of information ERIC is able to enter into the knowledgebase. By indicating whether a record was human cataloged or automatically harvested, users could filter out automated records if they felt they were not well indexed, or wanted better guarantees of accurate metadata description.

Network of Partners

Another significant change enabled by the creation of the ERIC Knowledgebase would be in determining entities allowed to add information to the knowledgebase. Currently only ERIC clearinghouses can enter records into the database, and then, only through the centralized facility. In the new knowledgebase clearinghouses could enter data directly into the knowledgebase, as could significant non-ERIC partners. Approved publishers, for example, could enter stub records directly, with the system tagging these records for later review, and allowing users to filter these records if they so desired. Further, by using standard metadata approaches, records could be added directly into the knowledgebase through harvesting. The harvest engine for the knowledgebase would recognize standard metadata schemes (such as Dublin Core) and translate this into schemes consistent with the ERIC Knowledgebase. Thus ERIC could utilize the labor of non-ERIC partners.

Interfaces

The key to making the ERIC Knowledgebase successful lies in the interfaces users engage to access the data. Once again, just as no single interface will work for the current ERIC Database, no single interface will work for the new ERIC Knowledgebase. While it will be necessary for ERIC to manage the underlying knowledgebase structure and systems, interfaces should be plentiful. ERIC should license the right to connect to the underlying knowledgebase. This license would not be geared towards revenue, so

much as control that key filters and fields are always obvious to the user (including clear indication of ERIC's identity). By ERIC managing the underlying knowledgebase users will be assured that no matter what interface they use, the underlying data is consistent.

By separating out the interface from the knowledgebase itself, vendors, partners and the ERIC system itself will be able to better match the information needs of users with their interface preferences. These preferences may relate to device constraints (connecting to ERIC on a cell phone), experience (simple searches versus professional interfaces), or software selection (embedding ERIC search capabilities directly into word processors for example).

Assessment Recommendations

This chapter has put forth a series of models, components and possible solutions for an ERIC assessment. It has concentrated on information flow and organizational structure over such assessment criteria as cost and return on investment. However, the author strongly believes that an evaluation focus on cost, particularly using the old operational assumptions of ERIC are dangerous and misleading. In the old model, ERIC did not cover the cost of user intermediation, it had a single information space it needed to populate (the database) and ERIC was a bargain then. Also using the pre-Internet model for ERIC will put ERIC in a very bad light. By looking at ERIC simply as a database, ERIC will come up desperately short in its ability to innovatively meet user needs. An assessment of ERIC must take into account needed changes to the ERIC database, while concentrating on the good work ERIC has done in the Internet. Certainly, means of coordinating these activities and rebuilding the cohesiveness of ERIC must be sought, but not by retreating to a marganilized database, or simply seeking to put the Internet genie back in the bottle.

ERIC must be considered as content aggregator, content creator and context provider. The database is content aggregation, and moving to an expanded and distributed knowledgebase should significantly improve the relevance of this ERIC function. The clearinghouses and their production of synthesis pieces and websites can be seen as the strongest aspect of ERIC and should be preserved and strengthened.

Finally, content without context is increasingly less useful in these days of information overload. User services and AskERIC providing a human voice and subject area expertise is a vital part of any Internet-based information system and should not be seen simply as an "add-on" function to the database.

Surviving the Networked Environment

ERIC is, in part, a victim of its own success, inventiveness and desire to serve. The issues the system must face are large and difficult. However, in the face of these problems, ERIC continues to serve users and increase its reputation as a significant and important resource. ERIC stands at the brink of a great opportunity. The system has not sat idly by as the Internet has exploded. It is an Internet-savvy organization. ERIC knows the Internet, and knows how to serve its users on the Internet. ERIC also knows how to serve traditional non-Internet users as well. The problem is its inability to rectify these two missions in its current operations. The system must begin to ask difficult questions and re-evaluate all its services in light of the current information and networked environment.

As the Federal Department of Education's National Library of Education prepares to evaluate ERIC, it is important to identify the key information services of the system. One means to reconcile ERIC's prestigious past, with its entrepreneurial present (and future) is through the advent of the ERIC Knowledgebase. The knowledgebase would take the current ERIC Database, unify it with the ERIC web-space and digital reference activities while creating a more distributed and agile information system. This knowledgebase would be based on standard metadata and would build a platform for future ERIC activities and priorities. Developing and implementing this model may provide ERIC with the means to fully exploit the web and networked environment for the benefit of its users.

This chapter suggests that an experiential approach to assessment may be a useful tool when used in combination with other more formal assessment techniques. Too often, formal assessment techniques fail to adequately consider the personal experience and knowledge of those who have actually participated in the development and administration of a program. The experiential approach, combined with an analytical deductive model – in this case the knowledgebase model – can offer evaluators one means to consider the future development of a program such as ERIC.

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