

19 DEVELOPING A VIRTUAL COMMUNITY-BASED INFORMATION SYSTEMS DIGITAL LIBRARY: A PROPOSAL AND RESEARCH PROGRAM

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Abstract

This paper proposes that the worldwide, virtual community of information systems researchers develop a digital library system to support the needs of its members and those of the larger community that IS researchers serve. It describes an initial vision for an information systems digital library (ISDL) and the potential contribution of an ISDL to the worldwide virtual IS research and practice communities, in terms of improving the research function, contributing knowledge to the IS field, improving transfer of knowledge to IS practice, and improving the reputation of the IS field with respect to other academic disciplines. While the academic and professional domain of an ISDL would be information systems, the lessons learned could be applied to other domains. The paper argues that, to be successful, a virtual community-based approach is needed for the planning, analysis, organization, development, and operation of an ISDL. Taken together, the development of an ISDL and the

institution of a virtual community-based approach provide rich opportunities for research into information systems that serve an entire community, development approaches that take community and consensus-building needs into account, and ways to restructure and improve upon the IS research community as an inquiring system. The paper briefly describes a framework for a research program and initial and planned research toward the practical realization of both an ISDL and community-based IS development.

Keywords: Digital library, group support system, soft systems methodology, information systems development, virtual community, virtual organization, scholarly discourse

1. Introduction

This paper proposes and discusses a research program into the creation of a digital library system by and for the IS community. A digital library is defined here as a computer-based system for the electronic storage of documents and publications in digital form and for their retrieval and presentation in human-comprehensible form. This definition is deliberately unrestrictive of the kind or format of the “document,” e.g., including multimedia. An information systems digital library (ISDL) would be intended to serve the needs of IS researchers, publishers, teachers, students, and practitioners, as well as other interested parties.

Digital library systems (covering whatever subject matter, in this case, information systems) are themselves information systems. They are also much more than just technological artifacts. They have potentially profound implications for the people and organizations that work on, use, and rely on them and for society at large. They have the potential to profoundly change the way knowledge is created and disseminated, both within (and between) research communities as well as between researchers and other potential societal consumers—in the case of an ISDL, students and IS practitioners. Put into other words, they provide alternative (hopefully improved) ways to conduct scholarly discourse and technology transfer.

Digital libraries have recently become a hot topic for research. There are ongoing series of ACM, IEEE, and European conferences as well as special issues of *Communications of the ACM* and *IEEE Software* on the topic. The advent of digital library systems has been enabled by the simultaneous development of data (e.g., text) compression, storage, and search technologies, faster and higher capacity computers, and Internet technologies enabling organizational and societal access to such technologies. The development of digital libraries represents both opportunities and challenges to the IS field and research community. The opportunities lie in research in digital library technologies and more importantly in suitably fitting them to organizational and societal needs. Therein also lie the challenges.

The practice of and tools supporting scholarly discourse have evolved (or emerged) over time. Use of e-mail, discussion lists such as ISWorld, chat rooms and video conferencing, the WWW such as on ISWorldNet, various conference and publication

websites, and electronic journals has altered the day-to-day practice of most researchers. The potential for these and other changes for IS research was described by Watson (1994). However, at this point in time, there has been little attention to digital library systems within the IS research community.

The field of IS provides much in the way of a theoretical basis for the establishment of suitable digital libraries within scholarly communities. As a human activity system (Checkland 1981), the system of scholarly discourse within the IS research community is an emergent one that is partly rationally designed and has partly evolved through accidents of historical timing, exercises of power, and serendipity. In *The Design of Inquiring Systems*, C. West Churchman describes different foundations and components for such systems (which include scholarly communities and discourse). Jürgen Habermas (1984) describes standards for the conduct of discourse by which the results of the discourse are legitimized for its participants. These ideas, together with many others that form the theoretical basis for the field of IS, could be (and, from the point of view of the authors, *should* be) brought to bear on the development of digital library systems and the roles that they might play within research communities.

This paper, therefore, proposes that the worldwide IS research community seize the opportunities for research and learning, as well as for improving scholarly discourse, by building a digital library system for itself and by studying the development processes and ongoing impacts.

The IS community can be characterized as a worldwide, virtual community with many and varied interests. As such, it is an example of the kind of communities that are evolving in the age of information. Such highly distributed, diverse communities present difficult challenges for the development of systems to support them. In order to adequately serve the needs of, and facilitate agreement among, the diverse stakeholders, which is essential to enable the success of an ISDL, we propose taking a virtual community-based approach to the planning, analysis, organization, development, and operation of an ISDL.

In the next section, we describe a vision for an ISDL, including possible features and the advantages that it would offer to the IS community. Section three describes a virtual community-based approach for developing an ISDL. Section four describes a framework for a multi-project program of research on both the ISDL and the community-based development approach. Section five discusses the potential benefits to the IS research community of building an ISDL. We then summarize and briefly give future directions.

2. A Vision for an ISDL

The authors' vision of an ISDL is one of a community-based service, which supports the IS community's goals and values. There are many possible (candidate) purposes, goals, objectives, functions, features, and services for an ISDL. In this section, we briefly introduce a vision of what we consider to be desirable for an ISDL system. We assert that we cannot and should not impose this vision on the community. Rather, we present it here only to motivate interest and begin discussion. In section 3, we propose and discuss a virtual community-based development approach that could be used to make specific decisions about an actual ISDL to be built.

2.1 The Central Idea

An ISDL could provide a single, unified source for flexible, full-text searching and retrieval of any kind of IS publication, at little or no cost, via the Internet. The central idea is to overcome the complex, chaotic situation illustrated in Figure 1, in which there are many means of distribution of IS research and knowledge, *none or even a few of which are sufficient by themselves*. Even existing digital library systems have problems of inadequate coverage, diverse user interfaces, and limited accessibility to subscribers. The current situation makes it difficult and costly to obtain publications (or the knowledge represented within them) and there is still a strong likelihood that some publications or knowledge will not be found, even with careful searches of multiple sources or distribution channels. Furthermore, easy access to web search engines is leading to reliance on lower quality material found on the web

We propose to augment, supplement, and possibly replace existing publication channels with an ISDL (see Figure 2), while providing additional services (described further below).

An essential feature of our vision is full-text searching. Full-text searching has become a practical way to overcome difficulties of keyword indexing systems (Witten et al. 1998). Full-text searching also offers the possibility to search publications' reference sections to locate those publications that cite a particular work, allowing one to conduct citation analysis and to identify related works.

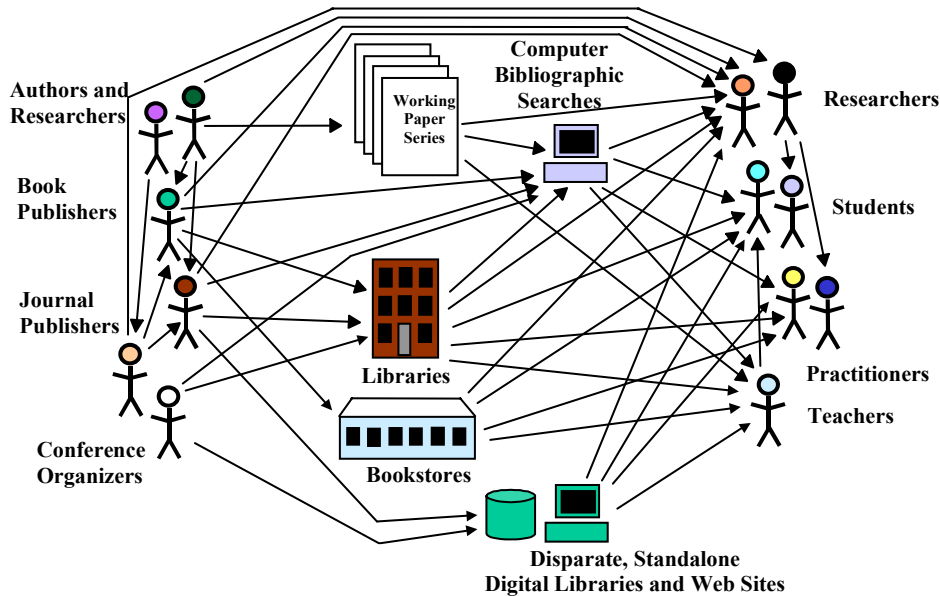


Figure 1. The Current, Very Complex Publication Distribution Situation (Simplified)

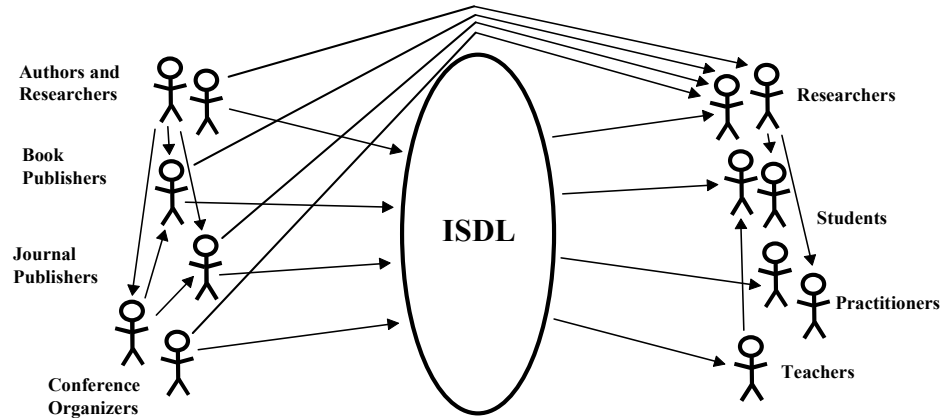


Figure 2. The Envisioned ISDL

Another essential feature of our vision is that the body of documents should be comprehensive, for example, including IS journals, conference proceedings, books, magazine articles, working papers, theses, web pages, even the content of discussion groups—whatever material is considered to be relevant and desirable to be searched and retrieved. In our vision, we distinguish between searchable publications and retrievable publications. While direct, free retrieval is preferable in an ISDL, it may not be practical in all cases. Where copyright or other interests prevent direct retrieval, support should be given for obtaining the publication indirectly, e.g., through physical library systems or at a cost from the publishers. Thus we might have comprehensive search support with less comprehensive retrieval support.

As a final element of our vision, we would like to see delivery of an ISDL service as a part of ISWorldNet, thereby making it freely available worldwide.

2.2 Candidate ISDL Features

Our main objectives for an ISDL would be to increase the probability of locating relevant publications and to reduce the costs of both searching for and retrieving relevant publications. However, an ISDL could potentially provide many other useful facilities. Table 1 proposes a number of possible features.

In our view, a particularly important potential area for an ISDL could be to greatly expand on the traditional role of libraries by providing a tighter connection with and support for scholarly discourse. For example, one could store/support reviews, ratings, or full discussions of particular publications within an ISDL (see White 1999) or have general discussions with references to publications available through the ISDL. The ability to reference publications from other publications and support tracing of their links (i.e., hyperlinks) within an ISDL would be a particularly useful way of supporting

scholarly discourse. We further envision integrated, full-text searching of these ancillary annotations and discussions (in addition to the main publications). A digital library could also support the review process (Roberts 1999; Sumner and Shum 1996). These concepts follow directly from a view of the IS scholarly community as an inquiring system (Churchman 1971) or as a (virtual) inquiring organization (Courtney, Croadsell, and Paradise 1998). There is much interest in the library science community in changing the role of libraries in scholarly discourse (ARL 1999).

Table 1. Some Candidate Features for an ISDL

Topic Area	Candidate Feature
Improve search	<ul style="list-style-type: none"> • Publication coverage (book, journal, magazine, conference, working papers, web page, discussion lists, etc.) • Full-text searching • Meta-data searching (publication type, date, etc.) • Combined (full-text and meta-data) searching • Search interfaces (graphical, shopping cart, etc.) • Multi-session search/query saving/refinement • Automatic notification of long-term searches • Cooperative (multi-user) searching • Intelligent (machine) support • Librarian (human) support
Improve retrieval	<ul style="list-style-type: none"> • Direct retrieval of free publications • Specified level of free retrieval (e.g., title/author, abstract, first page only, full-text, etc.) • Take payments for non-free publications • Indirect retrieval of copyrighted publications from publisher/holder • Link to library systems for alternative retrieval
Publication collection	<ul style="list-style-type: none"> • Meta-data (author, title, etc.) form filling and automatic fetching into ISDL • Electronic/e-mail system interfaces • Automatic, periodic search and retrieval from known sites
Facilitate scholarly discourse	<ul style="list-style-type: none"> • Citation analysis via full-text searching • Hyperlinks between references and publications cited • Links to reviews and/or critiques of publications • Discussion of publications • Ratings of publications
Technology: Open systems	<ul style="list-style-type: none"> • Standard interfaces for electronic queries from other systems, • Query results returned, retrieval from ISDL, links to other retrieval systems (e.g., libraries' or publishers' systems)
Other	<ul style="list-style-type: none"> • Subject browsing • Virtual reality interfaces (e.g., for browsing) • Multi-media documents • Thesaurus/dictionary/terminology support • Teaching/collection building support • Multiple, user-selectable bibliography format support

2.3 Usage Scenarios

To better illustrate the potential usefulness of an ISDL, we will discuss how an ISDL might support some common research tasks or scenarios.

The primary purpose that we propose for an ISDL would be to support the scenario of researchers searching for and retrieving publications on a new (to the researcher) topic or concept. To do so, the researcher (or an agent for the researcher) would go the ISDL web site, enter a query using the full-text search capability, view and refine the results, and click on publications to be retrieved. Depending on the availability, the publication could be viewed and/or printed immediately, or could be received via other means, such as by fax or normal post. Possibly on-line payment might need to be made to a publisher. This scenario is much like for existing bibliographic search systems except that a more comprehensive body of IS literature would be supported, which would reduce the need to know how to use multiple systems with disparate user interfaces and would enable the location and retrieval of publications unsupported by any other systems.

This scenario could be extended over time to include storage and retrieval of previous search queries and results, spreading the search out over multiple sessions and refining queries over time, as the researcher's understanding of the topic and how to form a more successful query changes.

Another extension to this scenario is where the researcher has an on-going, long-term interest in a particular (re)search topic. In this case, the researcher might leave a query in an active mode. The ISDL would then periodically check all active queries against newly arrived publications and notify the person who owns the query about any relevant, newly arrived publications.

A potential difficulty with query search systems is information overload in the query results, i.e., where there are an overly large number of hits (publications that match the query constraints). The ability to refine the query and to spread out refining the query and viewing its results over multiple sessions (as noted above) addresses this issue. However, the researcher might also wish to constrain the query in ways other than on full-text search criteria. An ISDL could support this by allowing refinement of the search by constraining it both on the text and on the publications' meta-data, such as date of publication (e.g., no publications over four years old) or type of publication (e.g., refereed publications only).

Another way to reduce information overload might be to prioritize the publications automatically in some way. One way might be to prioritize the search terms in the query, whether on the text or on the meta-data. Another way (assuming that this feature is supported) might be to sort based on ratings given by other readers/raters. A third way (again assuming that this feature is supported) might be to sort query hits based on how many other publications cite a particular publication that matches the query.

Researchers are often interested in locating publications that reference a particular publication, particularly their own publications, not just for reasons of ego, but because they identify papers and authors with similar research interests. The full-text search capability of an ISDL, which also covers the reference sections of publications, would make this relatively easy. The researcher would just enter the title of the publication in the full text search.

Researchers often work cooperatively when conducting searches. An ISDL could provide facilities to share work spaces, either synchronously or asynchronously, to divide up search results among different people to determine relevance, or to forward queries and/or results to others.

A common, simple scenario is where one has become aware of a particular publication and wishes to retrieve that single, known publication. If the researcher found the reference while viewing a referencing publication on-line via an ISDL (and this feature was supported), one might simply click on a hyperlinked reference within the referencing publication. Alternatively, the researcher (or agent) could do a quick search by typing in the author and/or title and retrieve the appropriate query hit.

Another research scenario/task that could be supported by an ISDL is learning how other researchers view a paper or discussing a paper with other researchers, including the authors. Currently such discussions happen formally through discussants' comments, which may or may not be published, semi-formally at conference presentations, and informally through face-to-face or e-mail discussions. An ISDL could store discussants' written responses, conference presentation slides, or even audio and video. An ISDL could further provide support for discussions of particular publications, whether synchronous or asynchronous, and store those discussions for future reference. Such discussions could greatly increase the richness of the captured scholarly discourse and make it more widely available to others.

A common research scenario/task is to construct a list of known references. Support for individual researcher's reference lists could be provided within an ISDL. This could be very useful in constraining searches by including a query term to *not* return a hit for any publications on a researcher's known reference list. Researchers could then easily add references to such lists. A researcher might even keep multiple lists, e.g., a list of "to be read" publications as well as a list of ones already read.

Another simple research task is obtaining a correct citation for a publication and incorporating it into the reference section of a paper. After conducting a search and locating a paper, an ISDL could provide its citation in whatever referencing system format the researcher desires, which could then be cut and pasted into the new paper's reference section. If one had a personal reference list, one could also copy it from there.

We have said little here about supporting the roles of teachers or students. Obviously many of the above scenarios apply to both of these roles. However, another task/scenario might be for a teacher to construct a list of references and to publish it for students to use in the context of a course. This might also be supported by an ISDL.

Finally, the creation of this sort of facility would create the need for various usability and housekeeping tasks that would also need to be supported, such as updating passwords, contact information, default settings, and so forth. Intelligent and tailorable defaults for search queries and the ability to change them easily would have a large impact on the usability of an ISDL.

In this section, we have discussed some task scenarios and how an ISDL might support them. The particular support would be dependent on the features provided by the ISDL, which would need to be designed and built. Some of them would be easy to provide and others more difficult. The above discussion also represents only a partial listing; many other scenarios could be supported.

3. A Community-based Approach to Developing an ISDL

There are many issues to be decided in the establishment of an ISDL. It is our view that the actual choices for the requirements, design, implementation, operation, and maintenance of an ISDL and for the resolution of important issues should be made in open discussion by the IS community as a whole. In this section, we discuss some issues and propose a method for addressing them.

3.1 Issues to Be Addressed

The most critical issue for the success of an ISDL system is to provide a suitable approach and features that will be accepted by enough of both the publication consumers and publication providers and publishers of Figure 2 to ensure a critical mass of users (Venable, Travis, and Sanson 1996a). Without enough consumers, there will not be adequate motivation for authors and publishers to provide publications. Without enough publications, there will not be adequate motivation for consumers to bother accessing an ISDL.

It is our belief that current technologies make an ISDL with the basic features described above easily technologically feasible. While technical issues are important, the primary obstacles are economic and socio-political issues. The various issues that would need to be decided in a community-based approach can be grouped into three main categories, as shown in Table 2.

Table 2. Categories of Issues for an ISDL

Economic and Socio-Political Issues:	<ul style="list-style-type: none"> • Ownership of the ISDL (IS community?) • Clients/customers to be served by the ISDL • Governance/organization • Funding for development, operation, and maintenance • Economic policy (e.g., fee charges, agreements with publishers) • Protection of the interests of copyright holders • Operational policies (access, etc.) • Relevant publications to be included
Functionality Issues:	<ul style="list-style-type: none"> • As in Table 1 • Prioritization and timing of delivery
Technical Issues:	<ul style="list-style-type: none"> • Centralized vs. Decentralized • Communication protocols • Security

While we believe that these issues need to be decided by the IS community, the authors' personal opinions are that ownership, clients, policies, and publication relevance should be as widely public and open as possible. We favor a model like that used for

ISWorldNet, in which a variety of people can be involved in as detailed a way as they choose. As for economic issues, we believe that the core functionality can be provided within the confines of normal discretionary research funding and that further development of more advanced functionality can be accomplished through grant funding and various forms of institutional research and teaching support. We believe that there will be no need to charge for services provided over the Internet. Nonetheless, these are only opinions and we recognize the need for interested stakeholders within the IS community as a whole to choose solutions to these issues themselves.

3.2 Development Approach

There are many different methods that could be used in a community-based approach to address the above issues and determine an appropriate way to go forward. One could use SWOT analysis, critical success factors, cognitive mapping, the Delphi method, or even focus groups. However, it must be recognized that the highly distributed nature of the IS community presents difficulties in applying any approach. It seems that for the actual development, a prototyping approach would be the most useful to ensure user satisfaction with the interface and functionality by the different stakeholder groups.

We believe that the choices of development approach and the decision-making process to be used in addressing the above issues are also matters for the IS community to decide. However, we again have our own ideas as members of that community as to how to best proceed, which we describe here. The IS community needs to develop a better understanding of the above issues in order to move toward action by building an ISDL. We need to be able to investigate the goals and desired functions of an ISDL in order to achieve a sufficient consensus to obtain a critical mass of adopters and to enable the system to be a success. In particular, we propose to use soft systems methodology (SSM), supported by a web-based group support system (GSS).

SSM (Checkland 1981; Checkland and Scholes 1990) is a well-known means for addressing “wicked” problem situations (such as requirements for an ISDL). The soft systems approach and its associated techniques (e.g., rich pictures, CATWOE, and root definitions) have proven useful for overcoming conflicting goals and complex problem situations to arrive at effective solutions to those problems. Furthermore, SSM is a systemic approach, which would invite wider consideration of the role of an ISDL within the IS research community and other academic practices. The use of the SSM conceptual modeling technique would provide better understanding of the functions and activities of the research community to better see where an ISDL could contribute and what other activities would be needed to enable an ISDL. SSM is also a flexible approach, into which one can incorporate other techniques not traditionally associated with SSM itself, such as the development methods discussed in the first paragraph of this section.

As an illustration of the relevance of SSM, in Appendix A we give examples of an initial exploration of the problem domain using some of the SSM techniques, which we developed from our own point of view. Participants in an SSM study would develop other versions from their own points of view.

SSM is generally applied by a person who is skilled both in the techniques and in facilitating groups to apply the SSM approach and techniques to take on the problem and to arrive at and implement their own solutions. Typically, this is accomplished through

face-to-face contact with the stakeholders individually and/or in groups. Group support systems (GSS) have been proposed as a way to facilitate the group processes in SSM (Galliers et al. 1991, Venable, Travis, and Sanson 1996b). Research in the use of GSS to support SSM has concentrated on their use in supporting same time, same place (face-to-face) group meetings.

However, in the case of an ISDL, face-to-face contact is difficult, if not infeasible, because the communities of stakeholders are highly distributed, i.e., they are located worldwide. The obstacles to scheduling and traveling to meetings with all the stakeholders individually or to face-to-face group meetings may be too difficult to overcome. Regardless of the choice of development method from among those identified above, the worldwide nature of the IS and publishing communities complicates the problem of applying the method. Venable, Travis, and Sanson (1996b) proposed the use of a web-based GSS as a means of overcoming situations where the stakeholders are too widely distributed for the normal application of SSM. A web-based GSS would be accessible to any stakeholder who has access to a web browser.

4. A Research Program Framework

The research proposed in this paper fits within a larger planned research program. The proposition, development and use of technologies to address specific or generic problem situations constitutes systems development in IS research. Nunamaker, Chen, and Purdin (1991) argue that this is legitimate research and propose an overall framework for programs of research in that area, similar to Figure 3 (adapted from Figure 2, Nunamaker, Chin, and Purdin 1991). An ISDL would be an example of such a computer-based information system technology. Furthermore, in our opinion, this framework can apply to IS development methods, tools, and techniques. The development and evaluation of GSS support for SSM is an example of such research combining methods, tools, and IS support. Thus, the framework can apply to research in both the ISDL as an example of digital libraries more generally and in the GSS/SSM method that we propose for its development (or in whatever virtual community-based method the IS community chooses to apply). This section describes the framework and our research approach within that framework.

A research program nominally begins with questions and theory building about a particular domain or problem area. General, higher-level theories must be tied down to detailed theories and decisions about individual, lower-level components of some system to be developed. Detailed theories lead naturally into the applied design decisions of systems development, i.e., prototype and/or product development.

In our case, we began our research with the propositions that an ISDL could be built that would be helpful to the IS community and that a GSS might be useful for supporting the distributed application of SSM, based on theories of the applicability of GSS and knowledge of their general capabilities. However, theories of how GSS are applied in distributed situations and how they could support SSM techniques are not extant, so theories needed to be developed in this area. In our case, this meant determining what sort of GSS we should use and how it should be adapted to support the stages and individual techniques of SSM. For our initial research, we chose a web-based GSS, *DiscussionWeb*tm (McQueen 1999), made specific decisions about how we would apply *DiscussionWeb*tm to support SSM, and implemented them in a prototype.

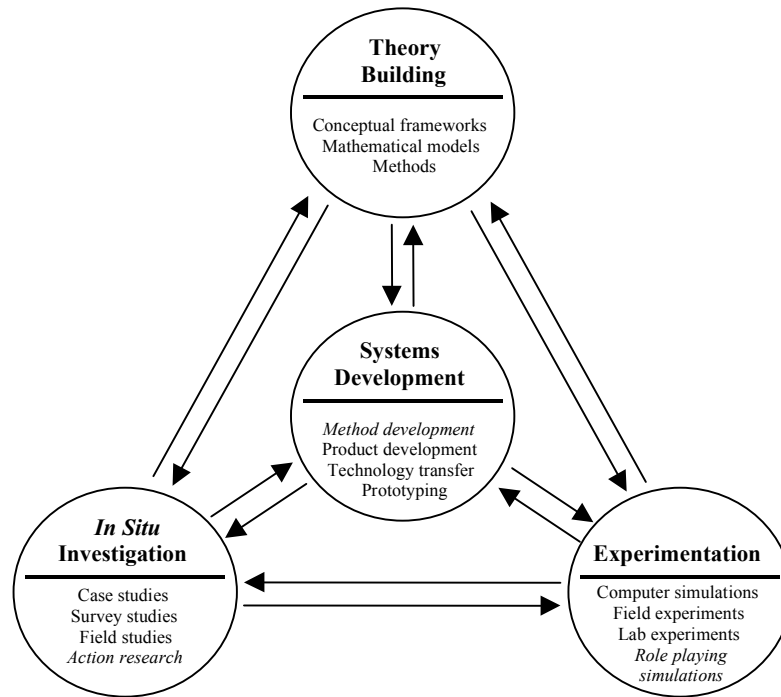


Figure 3. System Development in IS Research
(Adapted from Nunamaker, Chen, and Purdin 1991)

Once the detailed design decisions are made and a prototype and/or product is developed, then it must be evaluated to see whether the theoretical advantages of the prototype and/or product actually apply. As shown in Figure 3, this can be accomplished in either or both of two streams or learning cycles: experimentally (in an artificially constructed situation) or *in situ* (in a real situation). Typically, a research program would first use experimental research to explore the problem space and determine any issues to feed back to theory building and/or systems development, before using the system/technology in live situations, which would contain an element of risk that the system/technology might be inappropriate or cause practical problems. Experimental applications often are carefully designed in order to address specific areas of theory or system development. In other cases, they more generally explore feasibility and general characteristics.

Our initial study of using a GSS to support the distributed application of SSM was an exploratory prototype pilot evaluation using a role-playing simulation (Galliers 1985). We have added this (in italics) into Figure 3. The design of our pilot simulation and some of the results of the study were reported in Venable and Travis (1999).

Experimental application of systems/technologies is not adequate for evaluating systems or technologies that interact in complex and/or unpredictable ways with real organizational situations. What Nunamaker, Chen, and Purdin called observation, we

have termed “*in situ* investigation” in Figure 3, thereby expanding it to reflect the interventionist rather than passive nature of action research and have augmented Figure 3 to include action research (shown in italics) as a research method for *in situ* investigation.

We have developed an initial prototype ISDL (Venable 1999) to provide a discussion point and to make potential stakeholders aware of the possibilities that an ISDL might offer. The prototype ISDL addresses in particular the ability to combine meta-data and full-text searches, as well as entry of publications by authors and/or publishers. Figure 4 shows a top-level data flow diagram of the ISDL prototype. However, further work is needed before the prototype can be released for experimental use by the IS community. When released, the prototype will include an extensive sample of IS publications. Once development of the ISDL commences in earnest, one way to proceed is to continue to enhance this prototype significantly in accordance with requirements determined by the IS community at large.

In our opinion, it is absolutely essential to study technologies such as an ISDL or GSS support for distributed application of SSM further in real situations. Once we are satisfied with our prototype ISDL and GSS for SSM and with our experimental results, we plan to utilize an action research approach. Action research is particularly appropriate

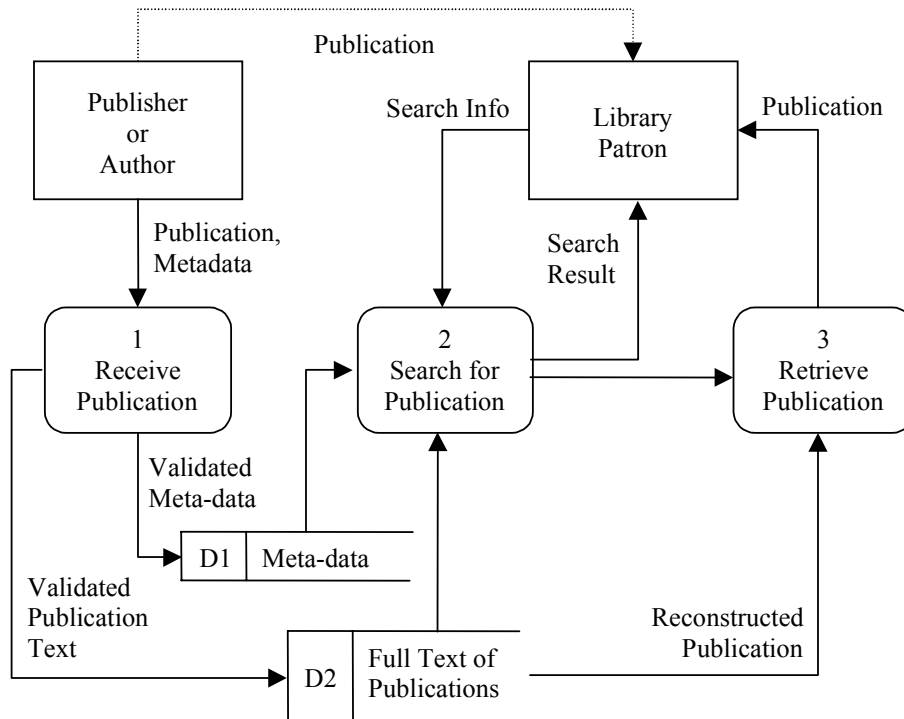


Figure 4. Top-level Data Flow Diagram of ISDL Prototype

in this situation due to our roles as interventionists and facilitators, especially if the IS community elects to utilize SSM. Ultimately, we believe that a research program combining both quantitative and qualitative approaches is appropriate in this situation (Jick 1979; Venable, Travis, and McQueen 1997). To that end, our pilot study of our GSS for SSM prototype was constructed to provide a basis for further quantitative study and measurement of improvement in subsequent versions of the GSS for SSM. As for the ISDL prototype, the ultimate measure of its success will be whether it is used or not. We also plan to study how it is used and to seek feedback on its strengths and weaknesses and on the usefulness of particular features as well as of the system as a whole. What we endeavor to create is an on-going relationship between developers and system users so that the ISDL will continue to be improved so that it better suits its users and the IS community.

5. Potential Benefits to the IS Community from Building an ISDL

We believe that the IS community would have much to gain by building and adopting an ISDL. One group of benefits are those that could accrue from the research and practice during the development process of an ISDL. First, we believe that the dialog engaged in during the process would result in the development of an improved vision and understanding of the community and field of IS. Secondly, conducting the process has the potential to reshape for the better the nature of the cooperation between the IS research community and publishers, as well as the cooperation between the IS research community and practitioners. Third, the process presents a good opportunity for ancillary research on organizational (and virtual organizational) issues relating to change, technology adoption, and development methods. Fourth, there would also be interesting opportunities for research on GSS success/failure, features, or social impacts.

Another group of benefits would come from the resulting availability and adoption of the ISDL itself. Having an ISDL would primarily improve accessibility of IS materials. It could also potentially improve IS teaching and technology transfer, as well as the process, content, and ultimately the results of scholarly discourse.

Finally, in our view, developing an ISDL could substantially increase the reputation of the IS community vis-à-vis other academic disciplines. If the IS academic community is able to successfully put the technologies and development methods that it espouses into practice, it would provide strong evidence of the utility of the knowledge that it creates and promotes both to business and to academia at large. A successful ISDL could serve as an example for improving scholarly discourse and technology transfer to industry, which could be followed by other academic disciplines.

6. Summary and Future Directions

In this paper, we have proposed that the IS community join together in a project to develop a digital library system for its own use. We have proposed some ideas for what an ISDL might look like and what benefits that one might provide to the IS community. We have emphasized that the most important thing is that community agreement will be necessary for the successful creation and adoption of an ISDL. We have also proposed

a virtual community-based method by which the necessary agreement and further development might occur. Once the preparatory work for conducting the development is completed, the commitment and participation of an adequate cohort from the IS community is needed to realize the benefits that the creation and adoption of an ISDL by the IS community could offer.

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Appendix A

Preliminary Soft Systems Methodology Analyses

In this appendix, we present some initial ideas in the format of SSM techniques for rich pictures, CATWOE, and root definitions. These ideas are from our own viewpoint and in the actual application of SSM, we would need to facilitate others to present their own viewpoints.

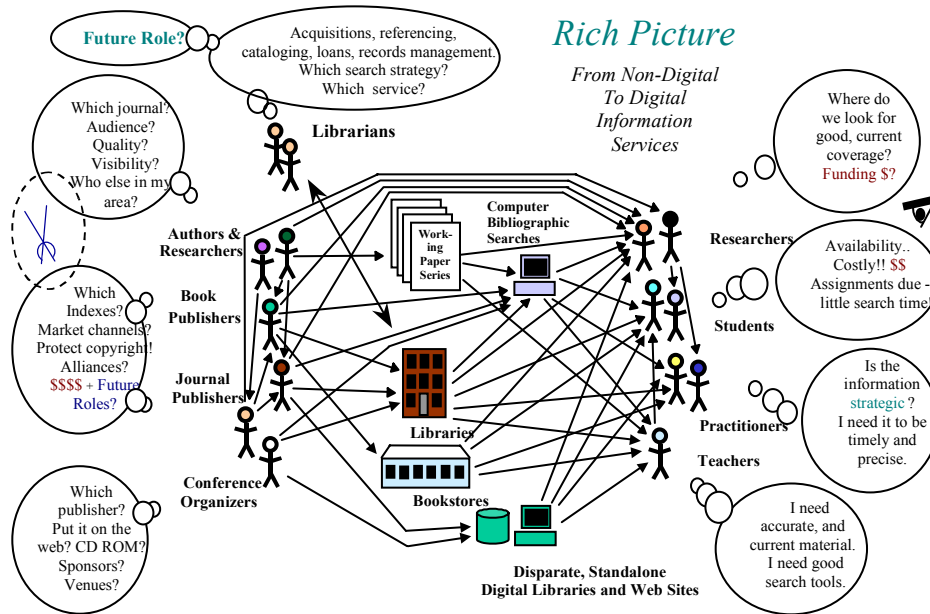


Figure A1. Rich Picture (Partial) of ISDL Context and Stakeholder Issues

CATWOE for an ISDL

Customers:	Publishers, Authors, Conference Organizers, Students, Teachers, Researchers, Practitioners
Actors:	Publishers, Authors, Conference Organizers, Research Librarians
Transformation:	<p>Too many, inadequate/limited publication search sources/distribution channels → Single, comprehensive publication search source/distribution channel</p> <p>Unknown, relevant publications → Identified and retrieved publications</p> <p>Poorly distributed publications → Well/more widely distributed publications</p> <p>Students, researchers, teachers, practitioners lacking information → Better informed students, researchers, teachers, practitioners</p> <p>An apparently chaotic, unstructured, difficult-to-follow scholarly discourse → a linked, better-structured, easier-to-follow scholarly discourse</p>
World view:	There is too much effort required to locate and obtain sufficient publications. Full-text searching can provide better identification of relevant publications. Web-based access is sufficient for enough of the community. Existing technology can be used effectively. Copyright needs to be protected.
Owner:	The IS research and publishing community
Environment:	Substantial web access at most locations, copyright regulations, competition among publishers, tight funding

Root Definition for an ISDL

An information systems digital library is a system owned by the IS community that would provide a single, comprehensive web-based distribution channel for publishers, authors, editors, and conference organizers to place IS publications for very low cost searching and retrieving by researchers, teachers, students, and practitioners, while protecting the copyright and commercial interests of the publishers and authors.