OBSTACLES IN WEB-BASED INFORMATION AND REFERRAL

by
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Advisor
This study explored the challenges that traditional, phone-based information and referral (I&R) agencies face in expanding their services over the World Wide Web (Web) medium. Through the use of an online survey, agencies providing Web and phone I&R were asked to compare their levels of service, support, and satisfaction between the two contact methods. Overall, 21 agencies across the nation with diverse service characteristics participated in the survey. From their responses, it was determined that the major challenges facing Web-based I&R was a lack of funding, insufficient evaluation methods and procedures, and inadequate usability for the searching process. Recommendations were presented to overcome these obstacles.

Headings:

- Community Information Services
- Information Networks
- Information Services
- Referral
- Web Usability
Introduction and Purpose

It is often noted that we, as a society, live in an information age where information seekers have unbridled access to the wealth of information around them. Given the vast amount of information, many information-seekers are overwhelmed by the sheer volume available. As a way of providing assistance to information seekers, information and referral (I&R) agencies were developed. By its general definition, information and referral refers to the process where an information seeker is provided some form of information that they can use to locate resources related to a topic or service they are interested in. Oftentimes, I&R agencies serve their purpose within the domain of human services. From a systems perspective, I&R can be defined as:

“...an organized set of systems of services, agencies, and/or networks that aims to facilitate universal access to human services. Through the use of an updated and readily retrievable resource file and/or automated databases, trained I&R staff link inquirers in need of information and/or services to appropriate resources in accordance with standards of professional practice. A reliable database also provides resources for advocacy, policy, programming, and social planning in the interest of promoting universal access to human services.” (Haynes 1995, p. 1,465)

For the scope of this study, information referral is defined from a two part content viewpoint: an informational component and a referral component. The informational component varies depending on the intended target audience of the I&R system. On the other hand, the referral-based component provides contact information, such as an address, phone number, email, or Web site for
the information seeker to use in their quest. Traditionally, an I&R specialist has been used to help guide the information seeker. These specialists serve as information brokers between the system and seeker and serve to translate the expressed information need into relevant results from the system. Historically, I&R agencies have used communication methods such as the telephone and mail service to provide information to their clients. The advent and growth of the Web has opened another avenue for providing information to facilitate universal access to human services. However, a large percentage of agencies have been slow to adopt this new method of providing information. As funds for I&R agencies become strained during times of economic difficulty, it may be in the interest of agencies to seek the cost effective benefits of expanding their services via the Web. In addition, as the general population continues to go “online”, it is assumed that information seekers will desire to have the option of receiving the same quality of service via the Web as they do by the more traditional methods. Thus, the purpose of this study was to explore existing obstacles I&R agencies encounter in providing their services via the Web and provide recommendations for service improvements in current and future Web I&R initiatives.
Literature Review

In order to better understand the challenges that the next generation of I&R systems face, one must examine the history of the field. Although the concept behind information and referral has been in existence since the earliest days of our society, it has only been a formalized system or service since the 1960’s (Health and Welfare Council of Central Maryland, Inc., 1971). Historically, its origins can be traced to the development and growth of service organizations within the United States and Great Britain in the later part of the 1800’s (Levinson, 2002). As information began to become a more valued commodity in the 20th century, reliance on information and referral services began to increase. Predominantly, I&R agencies reside within the generalized human services domain and as such are geared toward providing information such as housing, healthcare, and financial assistance toward its recipients. As the government continued to increase its participation in providing human services, it became apparent that standardized models would be needed to best convey relevant information to information-seekers. Thus, formalized constructs were put into place regarding information and referral services in the 1960’s. Since that time, the service delivery methods of I&R may have changed but the underlying constructs mirror the earlier thoughts of its originators.

As the numbers of I&R agencies have continued to increase since then, three major organizations have helped develop and guide the field over the last
forty years. The oldest of the three, the United Way of America organization (UWA), has been in existence since 1921 (Brilliant, 1990). UWA is a voluntary organization whose purpose is to provide referral information on a host of human services across America through its 522 statewide and regional chapter affiliates (United Way of America, 2001). It was the first agency to develop and adopt standards and criteria for being an I&R agency (Levinson, 2002). Today, it is still active in this endeavor and is a major proponent of the 211 initiative, an universal free telephone number that provides I&R and which is currently being developed at the state level across the nation.

The Administration on Aging (AoA) is a federal agency that was established in 1965 under the Older Americans Act of 1965 to provide information referral and assistance to the United States’ elderly population. It maintains and directs the national eldercare I&R service and maintains approximately 655 regional centers across the United States (National Association of Area Agencies on Aging, 2002).

The youngest organization of the three is the Alliance of Information & Referral Systems (AIRS). With the growth and diversification of information and referral agencies in the 1960’s, there arose a need for an organization to help standardize the field in addition to providing a level of professionalism. AIRS was established in 1973 to serve as an independent organization dedicated to the professional growth and coordination of the information and referral field. As such, AIRS has been responsible for the development of certification levels for information and referral professionals such as CIRS and CIS and
accreditation for I&R agencies. In addition, the organization has been a major contributor to the field through its numerous publications such as the Journal for Information and Referral. In promoting standardization, it has encouraged the adoption of the Info Line taxonomy developed by the Info Line organization (Sales, 1994) as the standard for all human service I&R systems (AIRS, 2000). By doing so, AIRS is attempting to bring consistency across I&R programs that will allow for greater collaboration between I&R organizations as well as consistency to end users of the system. Of the three major organizations, AIRS has the largest member base with 2,263 agency-members. In 1996, this reflected a 281% increase over measures taken in 1984 (AIRS 1996).

The introduction of the personal computer into the home and office in the 1980’s helped introduce automation technology to I&R systems. Prior to this period, the majority of I&R systems existed as files organized and searched by staff at their respective agencies. As collections grew, this method of searching became increasingly inefficient. Also during this time, numerous authors such as Schroder (1981) began publishing articles highlighting the benefits of computerization and automation for I&R systems. As funds became available, I&R agencies began migrating their systems to a digital format. It is important to note that for a majority of I&R agencies, available funding has been a strong factor in the agency’s adoption of newer technologies. By the late 1980’s, a large percentage of I&R systems were computerized (Levinson, 2002).
The next major technological wave to hit the I&R community was the development and growth of the World Wide Web. At its core, the Web and its various search engines can be viewed as a type of information and referral system. Given this similarity, one might expect extensive research on the Web and its impact on information and referral services. Unfortunately, this is not the case as it appears that there are few, if any, published articles regarding the topic of Web-based I&R. This may be indicative of the small percentage of I&R agencies using the Web for the dissemination of its information. What are the reasons for this lack of adoption? As mentioned earlier, available funding plays a significant role in agencies determining their level of technology implementation. Thus, the small numbers of Web I&R could be due to agencies not being able to adequately fund this service extension. Another possibility could be the field's indecision on its stance on the Web. As alluded to previously, the Web and I&R systems perform similar functions. As such, it may be that many perceive the Web as consuming the field of I&R. In reviewing the national standards from AIRS, it seems that a mixed message is presented concerning the Web. On one hand, the standards promote the adoption of technology but condemn it when it is used apart from human supervision as evidenced by the following statement:

"Under no circumstances shall technology reduce or replace supported access through a qualified I&R specialist. The main role of technology is to enhance or strengthen person-to-person contact, not to reduce or eliminate such contact or to make it more difficult.” (AIRS, 2000 p. 9)
One wonders whether the slow rate of adoption of the Web as a service delivery method could be due to the fear of being replaced by a computer. Due to this slow rate of adoption by the I&R community, entities such as community information systems (CIS) or community networks have been established to fill this void (Levinson, 2002). Oftentimes, these agencies act independently and without knowledge of the related I&R agencies. Thus, they do not draw upon existing models for organizing information or establishing policies. From a service delivery standpoint, there exists a gray area of responsibility between the two entities causing duplication of services and unclear information and service paths for users (Pettigrew and Wilkinson, 1996). In addition, it seems that these entities often engage in "turf battles" for funding, information, and users. In reviewing the I&R literature, one senses a lack of confidence in these other systems by the I&R community (Sales, 2000).
Methodology

Initially, the scope of this study was to be limited to North Carolina I&R agencies that provide their services via the telephone and Web. Candidates were selected from the membership directory of the North Carolina Alliance of Information and Referral Systems (NCAIRS), an affiliate of AIRS. The survey was designed for input from persons responsible for managing the I&R services of the agency (such as project coordinators or directors) that could provide specific information regarding the agency’s I&R services. Given this potential base of candidates, it was assumed that between twenty and thirty surveys would be submitted. Survey requests were emailed to the list of members (see Appendix: 1). Unfortunately, response was below expectations. After two weeks, the scope of the study was expanded to include input from I&R agencies across the nation who met the prerequisite of providing their services via the Web and telephone. The primary method of contact to this group was through an I&R listserv known as the AIRS Networker. The AIRS Networker is a project of AIRS and its current version has been in existence since September of 2000. It contains approximately 544 members. Due to time constraints, the survey was open to this group of candidates for one week. It was estimated that between 30 and 40 surveys would be submitted.

Survey Instrument:

After examining various survey methods and options, a Web-based survey was selected for data collection due to the predicted benefits in efficiency,
cost and reduced paper use and handling for the participants in this study. Since this research involved human-subject participation, an online consent form (see Appendix: 2) was presented to the user before they were presented the survey. Given the use of a Web-based survey, it was decided that the survey would need to be relatively short in order to encourage participants not to exit the survey before submitting their results. Thus, a survey of twenty questions was developed (see Appendix: 3). Initial tests by the author indicated that the survey would take less than 10 minutes to complete. The goal of the survey was to evaluate how an I&R agency provides for their Web and phone services. The questions on the survey were organized into the following categories: service, support, and satisfaction. The service component of the survey (questions 1-8, 16, 17) recorded descriptors on the service of the agency such as its service area, Web history, and reasons for providing this service. In addition, questions seven and eight inquired about the software product used in the Web service. The support section (questions 9 - 11), focused on financial resources involved in establishing and supporting the systems. The satisfaction section of the survey (questions 12 - 15, 18-20) captured data regarding the agency’s internal satisfaction with their service delivery models such as perceived strengths and weaknesses within their system. Also, it inquired about the satisfaction levels reported by users of the various methods (telephone and Web).
Results

After three weeks, twenty-one surveys were submitted, which was lower than expected. For reporting purposes, the percentages listed below have been rounded to the nearest whole number whereas the tables list the actual values.

In examining the characteristics of the surveyed agencies (See Table 1), it was discovered that 76% focused on I&R at the community level, whereas 19% concentrated their services at the state level and 5% at the international level. A large majority of the agencies did not report a specific audience for their given service focus. The majority of agencies surveyed (52%), reported that their agency had been providing Web I&R between 3 to 5 years with 95% reported having their Web I&R system developed and implemented within 12 months.

<table>
<thead>
<tr>
<th>Table 1: Web I&amp;R Characteristics</th>
<th>Population = 21</th>
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<tr>
<td><strong>Service Focus</strong></td>
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<tr>
<td>76% Community</td>
<td></td>
</tr>
<tr>
<td>19% State</td>
<td></td>
</tr>
<tr>
<td>5% International</td>
<td></td>
</tr>
<tr>
<td>0% National</td>
<td></td>
</tr>
<tr>
<td><strong>Web I&amp;R History (in years)</strong></td>
<td></td>
</tr>
<tr>
<td>10% less than 1</td>
<td></td>
</tr>
<tr>
<td>19% 1-2</td>
<td></td>
</tr>
<tr>
<td>52% 3-5</td>
<td></td>
</tr>
<tr>
<td>9.5% 6-8</td>
<td></td>
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<tr>
<td>9.5% greater than 8</td>
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<tr>
<td><strong>Software Product Used in Web I&amp;R</strong></td>
<td></td>
</tr>
<tr>
<td>76% Staff or contractor developed solution</td>
<td></td>
</tr>
<tr>
<td>9% IRis</td>
<td></td>
</tr>
<tr>
<td>5% Refer</td>
<td></td>
</tr>
<tr>
<td>5% Tapestry</td>
<td></td>
</tr>
<tr>
<td>5% Other</td>
<td></td>
</tr>
<tr>
<td><strong>Time needed to implement Web I&amp;R (in months)</strong></td>
<td></td>
</tr>
<tr>
<td>14% less than 3</td>
<td></td>
</tr>
<tr>
<td>38% 3 - 6</td>
<td></td>
</tr>
<tr>
<td>43% 7 - 12</td>
<td></td>
</tr>
<tr>
<td>5% greater than 12</td>
<td></td>
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Although all of the agencies in this survey provided Web-based I&R, only 29% receive funding to do so (see Table 2). Approximately 90% of the participants cited providing greater access to their information as a major reason for the implementation of a Web I&R system. Additionally, agencies listed the cost benefits associated with providing Web I&R such as having the system available 24/7 without having to pay for increased salary fees. The average cost in the development and implementation of a Web I&R system was less than $25,000. The average category for the yearly Web maintenance cost was in the $5,000 - $25,000 range. By comparison, the average category for the yearly phone maintenance was in the $25,000 - $100,000 range.

<table>
<thead>
<tr>
<th>Table 2: Financial Support Characteristics</th>
<th>Population = 21</th>
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</thead>
</table>
| **Web I&R Funded** | 29% Yes  
71% No |
| **Setup Costs (in thousands of dollars)** | 33% less than 5  
19% 5 - 25  
29% 25 -50  
19% 50 - 100 |
| **Cost Comparisons** | **Yearly Maintenance Costs (in thousands of dollars)** |
| **Phone** | **Web** |
| Less than 5 | 19% | 38% |
| 5 - 25 | 14% | 29% |
| 25 - 50 | 10% | 24% |
| 50 - 100 | 14% | 5% |
| 100 - 500 | 38% | 5% |
| 500 - 1 Million | 0% | 0% |
| Greater than 1 Million | 5% | 0% |

In comparing usage numbers and satisfaction results, Web systems lagged behind phone I&R systems. In usage numbers, agencies reported an average Web monthly usage category of 100 - 500, whereas the average category for phone I&R was in the 500 - 1000 range (see Table 3). For self-
reported satisfaction results, the average for Web I&R was in the neutral category, whereas the average for Phone I&R was in the satisfied category.

The results presented for the user feedback totals are skewed given that 62% of the agencies reported not collecting information for this I&R service. For the data that was collected, both I&R service averages were in the satisfied category although the phone average was considerably higher (4.71 versus 4.13).

Table 3: Comparison of Usage Numbers and Satisfaction Results

<table>
<thead>
<tr>
<th>Population = 21</th>
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<tbody>
<tr>
<td>Average Monthly Usage Numbers</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Not Collected by Agency</td>
</tr>
<tr>
<td>Less than 100</td>
</tr>
<tr>
<td>100 - 500</td>
</tr>
<tr>
<td>500 - 1,000</td>
</tr>
<tr>
<td>1,000 - 5,000</td>
</tr>
<tr>
<td>5,000 - 10,000</td>
</tr>
<tr>
<td>Greater than 10,000</td>
</tr>
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Self-Rated Satisfaction Values

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<th></th>
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<tbody>
<tr>
<td>Very Dissatisfied</td>
</tr>
<tr>
<td>Dissatisfied</td>
</tr>
<tr>
<td>Neutral</td>
</tr>
<tr>
<td>Satisfied</td>
</tr>
<tr>
<td>Very Satisfied</td>
</tr>
</tbody>
</table>

User-Rated Satisfaction Values

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<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Collected by Agency</td>
</tr>
<tr>
<td>Very Dissatisfied</td>
</tr>
<tr>
<td>Dissatisfied</td>
</tr>
<tr>
<td>Neutral</td>
</tr>
<tr>
<td>Satisfied</td>
</tr>
<tr>
<td>Very Satisfied</td>
</tr>
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</table>

In examining the software choice used for implementing, it was surprising to see the large percentage (76%) of staff or contractor developed implementations over the “off the shelf” solutions such as IRis, Refer, and Tapestry (see Table 4). The opposite was expected given the success of the software vendors in the desktop I&R domain. In examining the reasons for the
implementation of a particular system, cost and customizable features weighed heavily in the decision process. Upon further review, the average setup cost for the staff/contractor solution was in the $5,000 - $25,000 category. In comparison, the average setup cost for IRis, Refer, and Tapestry was in the range of $25,000 - $100,00. In evaluating yearly maintenance costs, the staff/contractor solution fell in the $5,000 - $25,000 category, whereas the other solutions were in the range of $5,000 - $50,000. Satisfaction levels between the implementations averaged in the same categories (satisfied) although the average user satisfaction results for the latter category are based on one result.

<table>
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<tr>
<th>Table 4: Software Implementation Comparison</th>
<th>Population = 16</th>
<th>Population = 4</th>
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<tbody>
<tr>
<td>Category</td>
<td>Staff/Contractor Implemented</td>
<td>Combination of IRis, Refer, Tapestry</td>
</tr>
<tr>
<td>Average Category Setup Time</td>
<td>3-6 moths</td>
<td>3-6 months</td>
</tr>
<tr>
<td>Average Category Setup Cost</td>
<td>$5,000 - $25,000</td>
<td>$25,000 - $100,000</td>
</tr>
<tr>
<td>Average Category Yearly Maintenance Cost</td>
<td>$5,000 - $25,000</td>
<td>$5,000 - $50,000</td>
</tr>
<tr>
<td>Average Category Self-reported User</td>
<td>Satisfied</td>
<td>Satisfied</td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Category User Satisfaction**</td>
<td>Satisfied</td>
<td>Satisfied</td>
</tr>
</tbody>
</table>

**High percentage of not collected values excluded. Population size was 8 (7 staff/contractor, 1 for Tapestry)**
Discussion

Given the results, what are the major challenges that these agencies face in providing Web-based I&R? The first hurdle that many agencies face is providing this service without the proper funding for this endeavor. With over 70% of the surveyed agencies operating their Web-based I&R without designated funding, the agencies are providing this service at a cost to themselves. As funding for I&R services becomes difficult to obtain, agencies without properly supported Web I&R may have to discontinue this service. Thus, it is imperative that agencies attempt to secure funding for this service extension. Just as one would not expect an I&R agency to provide its phone-based I&R without funding, an agency should not be expected to operate an additional service without the proper support. I&R agencies should present a plan to their financial backers highlighting the benefits of a Web-based I&R service for their intended audience. For example, an agency could report on the potential to provide their service beyond normal working hours and as a means of reducing the workload on more traditional routes of I&R. Additionally, a case for Web I&R could be made given the recent US Census statistics reporting over one-half, and rapidly increasing, of the homes in America having Internet access. As more individuals gain Internet access, their use of it as a means of information seeking will increase. Thus, it would be in the best interest of I&R agencies to be proactive and implement the systems for the growing base of users. If not, information seekers may turn to other
methods and may not receive the best possible service for their need. In doing so, this may cause a reduction in the use of the I&R agency as a whole and could adversely affect its funding. In essence, I&R agencies should actively seek funding for the expansion of their Web services as it may prevent them from becoming extinct in the new millennium.

Another challenge facing Web-based I&R agencies is the adoption and implementation of evaluation tools for their services. It was alarming to note that over 60% of the surveyed agencies do not collect data on user satisfaction regarding their Web systems. From an information system perspective, evaluation plays a vital role in determining its future. It lays the groundwork in the justification of any decision regarding a system such as to modify an existing system, build a new system, or do nothing at all. In order to properly evaluate a system, measures of performance need to be defined and monitored throughout the process. For a Web-based I&R system the following performance measures could be used in evaluating the system’s effectiveness: user feedback, I&R representative intervention incidences, and usage numbers.

Increased numbers of positive user feedback would suggest an increase in the success of the system to meet the user’s needs. Inversely, increased numbers of negative user feedback would suggest a decrease in the success of the system. User surveys could be used to capture the opinions of the users as well as any suggestions that they may have for improving the system. One approach could be to provide links to user surveys on every page in addition to providing an exit survey. The logic behind having a link to a survey on every
page is that it would allow the users who do not complete the process, possibly due to a system or user error, the ability to provide feedback rather than just gathering feedback once they have completed the entire process. In addition, the surveys could capture information on the individual pages that users are at and may provide a greater level of detail than only having an exit survey. It is recommended that the surveys contain a small number of questions, but still allow the user to elaborate on the feedback of they provide.

A decrease in the number of instances where an I&R representative aids in the online search with a user or does the search for them would suggest an improvement in the system. An increase would suggest the opposite. Like user surveys, direct feedback from I&R representatives could provide the data needed for this performance measure. In addition, a tracking system could be developed to review instances where Web users ran into problems and what was needed from the I&R professional to remedy it. Training on the Web I&R system would need to be provided to the staff in order for them to handle an additional information system.

Regarding the number of users, an increase over a given time period, especially return users, would suggest an improvement in the system. A decrease would suggest otherwise. Identifying devices such as cookies or logon id's could be stored and used for return visitors. Interactions with the I&R system could be tracked and used in reporting on return user incidences. A report system for showing Web-user volume over time would be used. These numbers could be used to compare with phone-user volume over identical time
periods. The goal in comparing the results would be to provide a baseline to measure gains or losses. Without having a benchmark for comparisons, faulty assumptions could be made.

Although not as vital or as directly conclusive, recording the number of page hits and search results could provide additional evaluation tools. Given that an online I&R system contains a logical sequence structure (e.g., a logon page precedes a search page which precedes a results page), an unequal number for the sequence pages, especially the search results page, could demonstrate that users are not following through the intended sequence of steps. This could be due to a problem with the system. An equal number for the sequence pages would suggest that the users were completing the process although it does not strongly imply that users were able to gather desired information. It only demonstrates that there were no insurmountable obstacles, which prevented them from using the information system. The use of a Web site analyzer could provide the data needed to evaluate the page hits for a Web-based I&R system. For the numbers of search results, instances of large search results or zero search results may suggest user difficulty in expressing the information need to the system (a breakdown in performance). In addition to the system being able to track the number of return uses, it could be used to record search results for a given information need. Thereby, providing the data needed for this performance measure. Although Web hits and search results only capture actions performed by the user, and not what they were thinking, they could be very helpful in evaluating a system. For
example, an inordinate number of page exits from a search page with a specific browser may suggest a coding problem that has not been tested for that particular Web browser. Besides, recording page hits does not require enormous effort given the numerous Web site tools capable of performing this basic function. Examining search results could provide interesting information. As mentioned above, it may reflect the system’s inability to help the user in properly stating their information need. On the other hand, it may show the uneven distribution of resources within a given I&R system. For example, suppose a user is searching for summer camps for children with developmental disabilities. The system with which they are performing the search may not contain any information on this topic or it may contain thousands of referrals. By examining the results, one could do a better job of collections development of resources within the system.

From the user’s perspective, the greatest challenge in Web-based I&R is finding the information they seek from their interactions with the system. As many agencies noted, the search process was viewed as the greatest weakness of the system. As mentioned earlier, Web I&R differs from the more traditional routes in that it occurs without the intervention of an I&R professional to translate the stated information need into an acceptable query for the system. Without this intervention, it is imperative that the search interfaces be user-friendly and the search process yield accurate results. In examination of the current generation of Web I&R systems, it appears that many fail to provide the needed usability for the information seeker to obtain comparable results as
the information seeker aided by an I&R professional. The majority of Web I&R systems provide the information seeker with three different categories for searching: name searching, location searching, service searching (often a combination of the three). Of these, name searching may be the easiest for the user to understand and use since it tries to find referral information for a given name. It is analogous to seeking information using the "white pages" of a phone book. Location searching focuses on providing referral information based on a geographic descriptor or descriptors provided by the information seeker. For example, one may want referral information for everything in North Carolina. Thus, North Carolina would be used as the geographic descriptor. By itself, location searching may not yield useful results since it is doubtful that users often search for human services solely by location. Only when combined with other discriminators such as services or names, does location searching play an important role as a discriminator. Of the three search models, service searching may be the most difficult for the user, but traditionally holds the greatest discriminatory value and is at the core of the information need. In keeping with the telephone book analogy, service searching is analogous to searching the "yellow pages" of the phone book where information is categorized by subject headings. In traditional I&R encounters, the I&R professional serves as the information broker between the information seeker and the system. They are the experts of taxonomy used in identifying and retrieving referral information and translating the expressed need within the confines of the taxonomy. In comparison, the information
seeker often is not aware of the taxonomy, only of their need. Problems occur when the term used by the information seeker does not correlate with the vocabulary used by the system. For example, an information seeker looking for housing shelters may enter in the term “shelter.” The system may have housing shelters categorized as “Assisted Housing Opportunities” or something similar. Without the use of a thesaurus to convert the user’s term into a system defined term, the search may yield no results, thereby causing the information seeker to leave believing that the I&R system does not hold information regarding this topic. Given this problem, some systems have been implemented that display the taxonomy to the information seeker and allow them to browse rather than search for services. However, problems can still exist when an information seeker’s understanding of a term is different from its intended use. One recommendation as suggested by Head (1999) and Raskin (2000) is to provide varying levels of search sophistication to the information seeker. For example, novice users could be provided a search interface that displays the taxonomy used as well as the system’s interpretation of the terms. As users continue to use the system, their mastery over the taxonomy would improve to a point where they would not need the same interface and could be better served by a more advanced version. By providing multiple interface options, the system gives the information seeker improved access to the information it contains.

Another option for improving usability is to provide extensions to the search results such that an information seeker can broaden or narrow the scope
of their results. The concept is similar to the use of a thesaurus for search terms but focuses on relationships between terms in the taxonomy. The incorporation of these anticipatory search features (Durrance and Pettigrew, 2001) could be beneficial in helping the user to better understand the taxonomy structure as well as promote serendipitous discovery of information.

Lastly, it is recommended that help constructs such as search examples be provided to the information seeker. Although this may seem elementary, a large majority of Web-based I&R systems surveyed do not have this feature. Having a link to an example helps a new user gain a better understanding of the information flow for the interface as well as the system. In addition, it allows the I&R agency to provide more information regarding the system and its interface and could highlight any problem areas associated with the system. Its implementation should reduce the level of requests for intervention by I&R professionals in aiding the user.

Conclusion

Further research is needed in examining the role and impact that Web accessibility has in information and referral. It is hoped that research such as this will pave the way for additional studies to discover other obstacles to Web I&R besides funding strategies, evaluation development, and usability issues. If the field of information and referral is to advance in this new information age against competing interests, it must take an earnest look at its service delivery methods and plan accordingly to meet the needs of their audience.
References


Appendix
Appendix: 1. Recruitment Email

Hello,

My name is Chris Lee and in addition to being the IT Manager for the Family Support Network of North Carolina, I am a master’s student in the School of Information and Library Science at UNC-CH. I am conducting a study of information and referral (I&R) agencies that provide a phone and a Web based system for meeting their I&R needs. The objective of this research project is to examine the challenges that phone-based agencies face in providing their services over the Web medium. Below is a link to a survey consent form that explains the goals of this research project as well as provides a link to the online survey.

http://fsnnc.med.unc.edu/ir_survey/ir_consent.htm

I hope you will take a brief moment of your time to answer this survey. It is composed of twenty questions and should take no longer than ten minutes to complete. Without the help of people like you, research on I & R systems could not advance. Your participation is voluntary and there is no penalty if you do not participate. Regardless of whether you choose to participate, you may have a summary of these findings. To receive a summary, please send me an email at Chris_Lee@unc.edu.

If this email has been sent to you in error, please accept my apologies and forward this email to the appropriate person, if any, within your organization.

Thanks in advance,

Chris Lee
Appendix: 2. Consent Form

Dear Survey Candidate,

My name is Chris Lee and I am a master's student in the School of Information and Library Science at UNC-CH. I am conducting a study of information and referral (I&R) agencies that provide a phone and a Web based system for providing their I&R services. The objective of this research project is to examine the challenges that phone-based agencies face in expanding their services onto the Web.

At the bottom of this page is a link to a survey. I ask that you look over the survey and, if you choose to do so, answer all the questions and submit the completed survey. **Note: This survey is limited to participants over the age of 18** (in order to ensure that minors are not being surveyed without proper parental consent). The results of this project will be summarized and included in my master's paper on Web-based I&R systems. I guarantee that your responses will not be identified with you personally or your organization as the survey does not contain any self-identification questions.

I hope you will take a brief moment of your time to answer this survey. It is composed of twenty questions and should take no longer than ten minutes to complete. Without the help of people like you, research on I&R systems could not advance. Your participation is voluntary and there is no penalty if you do not participate. Regardless of whether you choose to participate, you may have a summary of these findings. To receive a summary, please send me an email at Chris_Lee@unc.edu.

As our society continues to become more acclimated with the World Wide Web, I&R agencies need to focus on providing their services via this medium in addition to their traditional phone-based approaches. Through your participation, I eventually hope to understand the challenges that these organizations face and develop a "best practices" guide for other agencies to use as they venture into this realm.

If you have any questions or concerns about completing the survey or about being in this study, you may contact my master's paper advisor, Claudia Gollop, PhD at (919)
962-8362 or gollop@ils.unc.edu, or me at (919) 966-9773 or Chris_Lee@unc.edu. You may also contact the chair of the Academic Affairs Institutional Review Board (AA-IRB), Barbara Davis Goldman, PhD at (919) 962-7761 or aa-irb@unc.edu

Sincerely.

Chris Lee,
Master's of Information Science Student
School of Information and Library Science
University of North Carolina at Chapel Hill

If you agree to participate in this survey, please click the link below

I Agree
Appendix: 3. Survey Instrument

### 2002 Web-Based Information & Referral Survey

If you have any questions regarding this survey, please contact Chris Lee at 919.966.9773 or via email at Chris_Lee@unc.edu

Note: In order to use this service, your Web browser will need to be able to handle: Javascript

[Click here to test your browser](javascript:alert('Test your browser for Javascript support.')) (if no response, you need to activate javascript).

If these terms are foreign to you, please click the term above to learn more about it and how to enable it in your browser.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are you specifically funded to provide your information and referral (I&amp;R) services via the Web?</td>
<td>Yes, No</td>
</tr>
<tr>
<td>2. Who is the intended audience for your I&amp;R services (e.g. all, elderly, childcare, etc.)?</td>
<td></td>
</tr>
<tr>
<td>3. What is the service-area focus of your I&amp;R services?</td>
<td>Community/regional, statewide, national, international</td>
</tr>
<tr>
<td>4. How long have you had a Web-based I&amp;R system?</td>
<td>Less than 1 year, 1 - 2 years, 3 - 5 years, 6 - 8 years, greater than 8 years</td>
</tr>
<tr>
<td>5. What were your organizations reasons for providing a Web-based I&amp;R system?</td>
<td></td>
</tr>
</tbody>
</table>
6. How long did it take to initially set up your Web-based I&R system (including development and product research)?
   - less than 3 months
   - 3 - 6 months
   - 7 - 12 months
   - greater than 1 year

7. Which product type best describes your Web-based I&R system?
   - In-house or contractor developed
   - IRis
   - Refer
   - Tapestry/VisonLink
   - Other. Please list its name: [ ]

8. What were the leading factors that influenced your decision to go with the above solution for your Web I&R needs?

9. What was the estimated initial cost in deploying your Web-based I&R system (including personnel costs)?

- [ ] less than $5,000
- [ ] $5,000 - $25,000
- [ ] $25,000 - $50,000
- [ ] $50,000 - $100,000
- [ ] $100,000 - $500,000
- [ ] $500,000 - $1 Million
- [ ] greater than $1 Million

10. What is the estimated yearly cost in maintaining your Web-based I&R system (including personnel, hardware/software, network hosting, etc.)?

- [ ] less than $5,000
- [ ] $5,000 - $25,000
- [ ] $25,000 - $50,000
- [ ] $50,000 - $100,000
- [ ] $100,000 - $500,000
- [ ] $500,000 - $1 Million
- [ ] greater than $1 Million

11. What is the estimated yearly cost in maintaining your phone-based I&R system (including personnel and phone system charges)?

- [ ] less than $5,000
- [ ] $5,000 - $25,000
- [ ] $25,000 - $50,000
- [ ] $50,000 - $100,000
- [ ] $100,000 - $500,000
- [ ] $500,000 - $1 Million
- [ ] greater than $1 Million
12. Overall, how satisfied are you with your organization's Web-based I&R system?
   - [ ] very dissatisfied
   - [ ] dissatisfied
   - [ ] neutral
   - [ ] satisfied
   - [ ] very satisfied

13. Overall, how satisfied are you with your organization's phone-based I&R system?
   - [ ] very dissatisfied
   - [ ] dissatisfied
   - [ ] neutral
   - [ ] satisfied
   - [ ] very satisfied

14. In your opinion, what are the strengths of your Web-based I&R system?

15. What do you perceive as the weaknesses of your Web-based I&R system?
16. What is the average (estimates will suffice) monthly number of users of your Web-based I&R system?
- Not Collected
- less than 100
- 100 - 499
- 500 - 1,000
- 1,000 - 5,000
- 5,000 - 10,000
- greater than 10,000

17. What is the average (estimates will suffice) monthly number of users of your phone-based I&R system?
- Not Collected
- less than 100
- 100 - 499
- 500 - 1,000
- 1,000 - 5,000
- 5,000 - 10,000
- greater than 10,000

18. On average, how do your users rate your Web-based I&R services?
- Not Collected
- very dissatisfied
<table>
<thead>
<tr>
<th>Option</th>
<th>Checkbox</th>
</tr>
</thead>
<tbody>
<tr>
<td>very dissatisfied</td>
<td>☐</td>
</tr>
<tr>
<td>dissatisfied</td>
<td>☐</td>
</tr>
<tr>
<td>neutral</td>
<td>☐</td>
</tr>
<tr>
<td>satisfied</td>
<td>☐</td>
</tr>
<tr>
<td>very satisfied</td>
<td>☐</td>
</tr>
</tbody>
</table>

19. On average, how do your users rate your phone-based I&R services?

- Not Collected
- very dissatisfied
- dissatisfied
- neutral
- satisfied
- very satisfied

20. If you were to re-implement your Web-based I&R system, what would you do differently (if anything) and why?