CENDI / 97-2

CENDI

IMPACT OF THE INTERNET ON CUSTOMER SERVICE AND PRODUCT DEVELOPMENT AMONG THE CENDI AGENCIES

Workshops Held
February 4, 1997 and April 8, 1997
DOE Forrestal Building, Washington, D.C.

Submitted by
CENDI User Education Working Group

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August 1997

DTIC QUALITY INSPECTED 1

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20000411 146

CENDI WORKSHOP ~ FEBRUARY 4, 1997 AT DOE

THE IMPACT OF THE INTERNET ON CUSTOMER SERVICE

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CENDI WORKSHOP ~ APRIL 8, 1997 AT DOE

THE IMPACT OF THE INTERNET ON PRODUCT DEVELOPMENT

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CENDI is an interagency cooperative organization composed of the scientific and technical information (STI) managers from the Departments of Commerce, Energy, Defense, Health and Human Services, Interior, and the National Aeronautics and Space Administration (NASA).

CENDI's mission is to help improve the productivity of Federal science- and technology-based programs through the development and management of effective scientific and technical information support systems. In fulfilling its mission, CENDI member agencies play an important role in helping to strengthen U.S. competitiveness and address science- and technology-based national priorities.

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EXECUTIVE SUMMARY

The CENDI agencies are putting more and more information on the Internet, where traditional as well as new user communities have access. The Internet is creating new opportunities for immediate response, up-to-date support tools, and new products. However, it is also providing new challenges for customer service (including helpdesk support, user training, documentation, and order processing) and for product development in a rapidly changing environment. Agencies are finding a new user community for their products and services, but resources originally intended for the agencies' more traditional audiences are being stressed to provide services to the new communities.

In order to address this situation, the CENDI User Education Working Group conducted two inter-agency workshops. The first, on the topic of the *Impact of the Internet on Customer Service,* was held at DOE, Forrestal Building, on February 4, 1997. The second, the *Impact of the Internet on Product Development,* was held at Forrestal on April 8, 1997.

In the first workshop, the agencies shared information regarding the increased helpdesk activity due to the Internet, the use of agency WWW sites to provide information to users that otherwise might have required helpdesk support, the staffing and training issues in this new environment, and the use of the WWW as a resource for helpdesk staff. The group identified seven recommendations for follow-up.

In the second workshop, the agencies discussed the impact of the Internet on various aspects of product development. Lead agencies presented information about products they had developed for the Internet and the WWW in particular. Product design considerations, public user access, interface design, overlap with other products, and provision of adequate documentation and training were discussed. The group identified three recommendations for follow-up.

The evaluation of the two workshops by the participants was extremely positive. It was felt that these types of informational sessions should be held once or twice a year to provide a forum for the customer service and product development staffs from the CENDI agencies to discuss issues of mutual concern and better serve all their customers.

Introduction

The CENDI agencies are putting more and more information on the Internet, where traditional as well as new user communities have access. The Internet is creating new opportunities for immediate response, up-to-date support tools, and new products. However, it is also providing new challenges for customer service, including helpdesk support, user training, documentation, and order processing, and for product development in a rapidly changing environment. Agencies are finding a new user community for their products and services, but resources originally intended for the agencies' more traditional audiences are being stressed to provide services to the new communities.

Background

The topics were identified by members of the User Education Working Group and the proposal for a task group or workshop was presented at the CENDI Planning Meeting on August 28, 1996. At that meeting, the CENDI members expressed support and requested a more specific proposal. In subsequent discussions by the User Education Working Group and in CENDI meetings, specific issues were raised and some innovative solutions/approaches to these issues within certain CENDI agencies were identified. In its final proposal, presented and approved at the December CENDI meeting, the User Education Working Group (WG) proposed a series of intra-CENDI workshops to share information and search for innovative solutions to the challenges of the Internet. The workshops addressed the new opportunities afforded by the Internet environment as well as the new challenges.

Separate workshops were held to allow the participants to focus on the impact of the Internet on two diverse topics -- Customer Support and Product Development. The User Education WG also determined that the people who should attend the workshop on Customer Support were not necessarily the same people who should attend a session on Product Development.

This report gives the highlights of these sessions. The highlights of the workshops are presented in two separate sessions, since the two workshops were organized in different ways. The workshop on Customer Service was held on February 4, 1997, and the workshop on Product Development was held on April 8, 1997. The attendees are listed on pages I and ii. The workshops were moderated by the CENDI Senior Analyst. Recommendations for further follow-up studies were identified.

1.0 THE IMPACT OF THE INTERNET ON CUSTOMER SERVICE

1.1 Introduction

Prior to the workshop, the Senior Analyst, with the approval of the User Education Working Group, prepared a short questionnaire. The intent was to provide basic information about each agency and its helpdesk and to help the attendees get a quick understanding of each customer service environment. The team also developed an agenda (see Appendix A). At the workshop, a designated representative from each agency gave a brief presentation about the environment and the issues and challenges surrounding the customer service response to the Internet environment. The specific agenda topics were then discussed. The meeting ended with a brief discussion session to develop recommendations for further study or areas where various agencies could work together.

This report provides overviews of the CENDI agency helpdesk operations, highlights the common challenges and potential solutions that agencies have developed, and presents the recommendations for follow-up.

1.2 Agency Overviews

The helpdesks of the CENDI agencies vary widely, from reference desks to computer (technical) support to order processing.

1.2.1 Defense Technical Information Center (DTIC) Overview

The DTIC helpdesks serve the U.S. Department of Defense, its contractors, and federal agencies. There is a wide variety of material in the DTIC database. About one half of the material collected by DTIC is publicly available through NTIS.

There are four separate helpdesks. One provides customer service for registered users. This is staffed by two full-time people. The search assistance and ordering helpdesk is staffed by 12 people. (Over 50 percent of the calls at the search assistance helpdesk are by phone.) The telecommunications helpdesk is staffed by six people. The newest helpdesk for Business Process Reengineering is staffed by one person. The latter helpdesk is the only one that serves a particular database. Each helpdesk works independently.

1.2.2 Department of Energy/Office of Scientific and Technical Information (DOE/OSTI) Overview

The traditional helpdesk serves DOE and its contractors. It is staffed by six part-time employees who take turns manning the helpdesk. Voice mail is used for complete 24-hour coverage. There are approximately 1,000 inquiries per month. Five to six percent of these inquiries are for technical issues. The majority of the inquiries (85 percent) are by phone. Five percent are received by e-mail and 10 percent are by surface mail.

The Homepage Desk is different because it serves the public. There is one part-time DOE staff person on the desk. There are approximately 200 inquiries per month on subjects that vary widely. Approximately 20 percent are technical in nature. All inquiries are received via the homepage e-mail

address.

1.2.3 National Aeronautics Space Administration (NASA) Overview

The NASA Langley Research Center has been given responsibility for the administration of the NASA STI helpdesk. It is available from 8:00 am - 6:00 pm, EST. Inquiries are received by phone (including voice mail) and e-mail. Four staff members are dedicated to the helpdesk. The STI helpdesk provides consolidated access. Approximately 30 percent of the users of the database are NASA employees and its contractors, 10 percent are foreign users, 40 percent are from the public, and 20 percent are other government agencies and their contractors.

The number of inquiries have increased because of the Internet. The peak load for the helpdesk during 1995-1996 was 1,099 inquiries per month. Of this total, e-mail access averages 655 messages per month, the highest in FY 1997. Some requests are very technical and others are more "public" questions. Other NASA helpdesks are run by the NASA Public Affairs Office and the NASA Technical Transfer Office.

There has been a new emphasis on data tracking and customer service. The new customer support system includes the customer service homepage. It also includes materials ordering, registration, distribution and address maintenance, system assistance (NASA runs its own online search system), telecommunications, and search assistance. There is a fee for comprehensive search services.

1.2.4 National Air Intelligence Center (NAIC) Overview

NAIC has a single helpdesk to serve its intelligence analysts, other NAIC staff, and registered users of its systems. It does not serve the public. The majority of the calls are by phone or the customer can log his own inquiry into the support system. The support covers both computer support and technical support for the scientific content of the database. There are 18 full-time helpdesk staff.

1.2.5 National Library of Medicine (NLM) Overview

The NLM provides access to the health science literature. Its primary customers are health professionals and medical information specialists, but may include any member of the worldwide public. There is an interlibrary loan routing system called DOCLINE that is available with participating medical libraries in the United States and Canada. A national and local telephone service helpdesk is available. The MEDLARS online system has about 150,000 registered users. There are other medical information services available from the NLM that do not require user registration. The service desk handling many online services users is available from 8:30 am - 11:00 pm, Monday through Friday, and Saturday from 10:30 - 5:00 pm. A service desk is also provided in the main reading room of the NLM since there are many "walk-in" patrons. Eighteen information specialists are on the online service desk part-time. There are two people for most two-hour shifts for the online service desk. These information specialists and librarians also provide indirect customer service in terms of documentation, training, and database and systems testing.

The NLM online service area supplies information on using NLM's computer services (especially the Grateful Med and other search systems), provides account information, and supports technical troubleshooting on telecommunications, software installation, etc. A wide variety of products are

supported. At the NLM online helpdesk, Lotus Notes is used for a knowledge base of questions and solutions.

Ninety-two percent of the customer requests come to the helpdesk (menu options let callers leave name and address for mailed materials if they choose). Thirty-three percent of the customer queries for online services are received by phone (mail is a small portion). Internet e-mail is high and growing (700+ a month). There are about 170 phone questions daily (50 percent from health professionals, 25 percent from information professionals, and 25 percent from others). Currently, user registration from NLM online services is over 1,000 new customers a month.

The helpdesk has two e-mail addresses. There was an average of 165 messages per month but, with the introduction of Internet Grateful Med, this has increased to about 500 messages per month. The NLM WWW site had approximately 1 million hits in January 1997 alone. These messages are handled by 10 part-time people, for a total of 30 hours per month.

NLM is currently studying and reinventing customer services, including helpdesks and their activities.

1.2.6 National Technical Information Service (NTIS) Overview

NTIS has a variety of helpdesks to support specific databases/services, such as FedWorld, the *World News Connection*, and the new Health Care Finance Administration (HCFA) Payer ID file. The helpdesks have traditionally centered around particular products because of funding. This provides good in-depth support for each product, but creates an insular approach that can cause problems. NTIS is in the process of creating a separate help desk unit and establishing a closer connection between the helpdesk and the respective product manager. NTIS also is conducting cross-training programs so that there is an understanding of all NTIS products and services across the various helpdesks.

The National Performance Review study showed that two-thirds of the people using FedWorld have never heard of NTIS and 80 percent of the people never order a document. This means that there is the potential for much support and little revenue generation. However, as online ordering capabilities increase, this situation could change. Also, as part of the survey, it was identified that 85 percent of those surveyed rated the helpdesks from "good" to "very good". This is now part of an annual survey with ongoing feedback from users via e-mail.

1.3 The Impact of the Internet on Who Is Served

The floodgates have opened with the advent of STI program homepages. Everyone from graduate students to researchers and foreign nationals are now accessing the pages. There are more inquiries by non-registered users.

The populations to be served by the agencies are identified in their missions and, in some cases, by legislation. Most agencies have primary responsibility for their agency staff, contractors, and others working on agency-funded projects. In the case of DOE and DTIC, the STI program does not directly serve end users. The NLM community involves not only many professionals but also the general public.

In some cases, the customers that are served directly are dictated by location. At DTIC, there is a small amount of walk-in traffic because of the location in Fort Belvoir. There is no public reading room. DTIC has four regional offices that also serve walk-ins. NLM, on the other hand, has significant walk-in traffic because it is a national library and is close to the NIH and other medical institutions.

None of the CENDI organizations have a formal list of persons they would not serve. However, some prescreening is done by the self-selecting mechanism on the phone mail. If a person calling 1-800-CAL-DTIC doesn't know how to respond to the prompts, the system switches the call to the Customer Service Helpdesk. DTIC helpdesk staff do not ask people if they are U.S. citizens.

Prescreening is also accomplished by traditional registration mechanisms. Because of security issues, most traditional DTIC files have authorized users. Authorized users are determined by a registration/authorization function that may include security level and citizenship checks; it does require a user code. NLM, NAIC and NASA also register users.

1.4 Setting Priorities

Prioritization of requests is often an intuitive process. Few agencies have strict time limits on customer service calls. Agency related requests may be emphasized. For example, Pentagon and Congressional requests are given high priority at DTIC. NTIS has a time limit on certain types of calls. The level of difficulty is assessed and the helpdesk assistant may require up to 2-3 days to respond. NTIS helpdesk staff also routinely ask the person when the answer is needed.

1.5 Automated Tracking Systems to Support the Customer Service Activities

NASA, DTIC, and NLM have recently redesigned their customer support systems. Both internally developed and purchased systems are being implemented. The NASA Customer Support System (CSS) handles registration, document ordering, and distribution. It was developed internally, and has not yet been integrated with the helpdesk activity. DTIC developed the Customer Retrieval System. This system provides access to previous transactions and subscription information based on the user's ID. This system also was developed internally.

NLM recently purchased a new automatic customer service call distribution system called Teloquent, and a new call-tracking system called CustomerQ. NLM historically did not track daytime helpdesk

calls except during a two-week survey period. Their evening hours contractor collects complete statistics. However, they have been unsuccessful in linking their Lotus Notes knowledge base directly this tracking system. The new software and hardware will be installed and activated over the next few months. Several agencies expressed an interest in a demonstration of this system when it has been installed.

1.6 Automated Phone Systems to Support Customer Service

In addition to automated customer support systems, automated phone systems are important tools when managing workload of helpdesk staffs. Many agencies rely on automated systems and voicemail to balance their workload and to provide statistics. DTIC's ACS phone system has the ability to handle 51 operators simultaneously. Two-thirds of the full-time people in DTIC could be connected at the same time.

Simple, direct voicemail systems are important. NLM decided to use one new "800" number, a simplified menu, and integration of customer service information and staff so that users can get consistent and complete information. At DTIC, the computer support branch worked with a triage system, but eliminated the first tier operator in favor of multiple selections, because users did not like being "shunted" from one operator to another. [There was a discussion of the problem of too many menu choices and misdirected calls. The group suggested that no more than four menu choices should be included at any level.]

NTIS uses answering services to supplement staff and to ensure that customers get connected to a real person. The helpdesk staff check the answering service report each morning and throughout the day.

The discussion of software packages used for various purposes within the customer service environment led to the recommendation of a special session and more technical discussions on certain kinds of software.

1.7 Using the Internet to Provide Referrals

The increase in inquiries from non-registered users and non-traditional customer groups leads to more questions that are out-of-scope for the particular agency. This leads to referrals to other agencies and organizations.

DOE/OSTI tries to help the caller by giving him relevant URLs, hotline numbers, or by pointing him to the DOE homepage from which he can access other areas within the agency. A well designed homepage can reduce the number of vague and general questions that are received at the helpdesk. The Webmaster may also provide some answers or forward questions as necessary.

NASA refers users to WWW pages and URLs. Finding these references takes time on the part of the helpdesk staff, but retaining these references can speed future referrals and build a knowledge base for the staff. [The problem of changing URLs was discussed briefly.] Each NASA center has its own specialty, that is important for the helpdesk staff to know. There is also an extensive collection of phone books.

The Intranet can serve as a means of training and supporting helpdesk personnel. For example, staff meetings are documented and made available via the Intranet, so that those staff who must man the helpdesk during the meetings can be kept informed. NTIS has found that GOVDOCL is a valuable listserv. It contains answers from librarians to patrons on a variety of government databases and resources. NTIS also uses internally developed canned messages to deal with receiving requests. NASA has developed several support tools for the helpdesk staff, including standardized responses to frequently asked questions and access to NASA press releases. NLM provides its helpdesk staff an online manual. NASA has developed a series of e-mail folders that hold messages for different categories of questions.

At NLM, it is a question of one funnel or numerous helpdesks. They are looking at consolidating the phone mail choices. The goal is to have 80 percent of all the calls routed correctly the first time. This requires training and they have seated the helpdesk staff in the same area. It comes down to a question of how wide the base of knowledge is of the individual staffer. They have developed checklists so that staff with less experience can still help the user. Helpdesk staff are trained in other resources almost as if they were librarians.

1.8 WWW Design for Customer Support

All agencies, except NAIC, have a customer service presence on their public WWW sites. The placement of the customer/user services homepage varies within the entire site for the STI program or the agency. The public presence of these sites increases the need to pay attention to the content of the customer services portion of the site.

DTIC finds the people who access via the homepage to be polarized at two extremes-- the very technical and sophisticated user or the very naive user. The helpdesk was asked to supply information for the homepage that would help both types of users. There is also a Mail To feature that provides e-mail access directly to DTIC staff. DTIC phone numbers are very visible on the site, which may be the reason for the increased phone traffic.

The Doe Webmaster at OSTI described efforts to revise the DOE Home Page which is operated and maintained for the DOE Office of Human Resources and Administration by OSTI. There is now a Revision Subteam, led by OSTI, made up of program and department employees interested in DOE WWW development.

The current DOE Home Page is organized by the DOE organization structure. Approximately fifty percent of the users are non-departmental users who have trouble working through the bureaucratic structure to find needed information. Therefore, the major effort has been to develop a Subject / Topic Pathway to direct users to the contents of the main DOE Home Page as well as the other Websites it points to across the DOE complex. The pages are organized by subject or topic to supplement the organization structure of the main site. The Subteam has developed a dozen primary subjects and is in the process of prototyping this concept.

There are maintenance issues involved. One, the DOE content providers for the Subject / Topic Pathway need an efficient and effective way of identifying or tagging their content. The tags will enable the software indexing the sites to post the designated content to an appropriate location(s) within the Subject / Topic Pathway. Another issue is the inclusion of currency or date tags as well as

author or source tags in the content records. These tags will provide the maintainers of the Subject / Topic Pathway a means to identify older material and provide a source from which to obtain replacement data or deletion agreement, etc. This process will work to ensure data in the Subject / Topic Pathway is up-to-date. Recent activity of the Subteam includes identifying DOE WWW content providers and organizing them via a listserv.

OSTI has dedicated staff to managing the homepage activity. The Intranet carries guidelines and standards to be used by content providers when producing HTML documents. HotDogPro instructions also are included. The MOM Spider Robot is used every Sunday to check for broken or problem links or pages that have become unlinked. A committee will provide editorial review of the content.

Several agencies have Frequently Asked Question (FAQ) pages on their customer service WWW sites. At NTIS, FAQ's have not been well developed. There is a sense that people don't read them, especially if they must go through several layers of WWW links. NTIS has developed canned responses to cut and paste into e-mail messages. NTIS uses broadcast e-mail for HCFA Payer ID, WNC and other subscription services to keep customers informed and to anticipate questions in advance (e.g., holiday hours, system problems). NLM is interested in making customer service information available via the WWW, so that interested users may access solutions data using any Web browser. NLM may be able to import e-mail inquiries, track them using CustomerQ, attach WWW documents, and put the message back out to e-mail to the customer.

1.9 WWW Search Engines

There is another subteam at OSTI looking at a search engine for the site. They are intentionally showing the subject access visually rather than just as a text search tool. DTIC mentioned that they have added a FINDIT to their WWW site to make it easier for users to find specific bits of information.

1.10 Logging WWW Activity

All agencies had statistics on how many "hits" were logged against their WWW sites. However, all acknowledged that these statistics based on WWW access logs are problematic. The number of individuals accessing the sites are fewer than the number of hits would imply. DTIC counts accesses by links (three links constitute a real access). DOE indicated that some statistical packages also count by the "gif" images that are opened, which increases the number of hits depending on the number of "gif" images used on a page. An alternative is to count those accesses coming into the homepage only, but then lower-level bookmark accesses are not counted properly. Some statistical packages have problems with sites that have been removed. DoD is looking for a standard from access to leaving rather than the link hits.

Identifying who is accessing the WWW site is equally difficult. The specific IP address is not necessarily valid, but the domain level can provide valuable information. IP addresses are hard to categorize in a meaningful way because " .com" could be a government contractor. Most systems track by IP address, not from where the business is coming. There are also issues of privacy and of

archiving the logs. DTIC has developed a guest log-in page on its WWW site where users can provide information about themselves.

The group also discussed the use of "cookies" to attach to the accesses that come to the WWW site. This technology is used by commercial organizations to distribute advertising. The privacy issues were discussed. Minimally, the user should be made aware that a "cookie" could be attached and given the option to have it bypassed.

The group decided that a more thorough discussion of what statistics to collect would be helpful—how to count and what impacts do they have? The work of the Federal Web Consortium was discussed. The thought was expressed that statistics for hits should be addressed as part of their work. A member of the DTIC staff is the chair of this group.

1. 11 Intranet Support to Helpdesk Personnel

At NLM, results of the helpdesk assistant's research are moved from e-mail to the solutions group and the solutions database is created, searchable under Lotus Notes. The problem is the aging of the database of solutions and the answers. It is impossible to create an online database answer for every question. The group discussed the likelihood that the helpdesk staff would actually complete the database when there is other work to do. It is important for the staff to understand that, in the long run, this effort will reduce the time involved in answering questions.

1.12 Physical Environment

While not directly impacted by the Internet, the group discussed the physical set up of their helpdesks. At NLM, there is a central helpdesk area to which the staff move. DOE also rotates the people because of the concern about burn-out. NASA rotates staff to a central location, but they can also pick up the phone as backup at their own desks. DTIC's reference area also participates in the helpdesk staffing, but not all the time.

DTIC indicated the problems of managing the helpdesk within the flexible work schedules. However, flexible scheduling has also helped to extend the work day so that the helpdesk can be easily manned for a longer period of time. DTIC encourages the use of the regional offices when a call comes in from one of these locations.

1.13 User Registration Via the WWW

The group discussed user registration via WWW forms with the results going directly to a database. NLM has implemented an online registration system using the secure Netscape and MS Explorer browsers. This collects the information for the registration; it goes directly to a proprietary Inquire database. There is an encrypted credit card area and the user only gets a user ID back in the clear, unencrypted area. The browser's encryption is used. DTIC, on the other hand, provides only the means to do an online request for the registration packet because of the security checks involved in the registration process.

NASA reported on a Process Action Team study to look at different points of collecting user information, multiple platforms, and different access points. The aim is to reduce redundancy. The

helpdesk system will "sit on top of" both the customer support and accounting systems, so the data is collected and maintained from only one system.

DTIC and the Department of Justice sponsored a WWW Security Workshop on March 4, 1997. Attendance was limited to system administrators and Webmasters. The DTIC representative ensured that relevant information from the security workshop was distributed through the User Education WG.

1.14 Recommendations

Several members mentioned the benefit of the Helpdesk Conference that is generally held in March of each year. Institutional membership is $ 425. Registration for the meeting is expensive. NIH attends and has tried in the past to get a special interest group for federal helpdesks created under this organization. There was some discussion about a separate group within the government that would not be affiliated with the formal helpdesk conference. Agency staff that participate in helpdesk-related conferences were encouraged to share what they learn with other CENDI agency helpdesk staffs.

In addition, the following recommendations were identified:

Hold a helpdesk conference specifically for federal helpdesk staff.

Create a set of helpdesk staff tools of value to all agencies.

Share URLs that the agencies find to be of value for helpdesk staff, both for their own professional awareness and to help customers.

Design a page that could be incorporated into each agency's helpdesk Web site that would connect users to other relevant sites within the CENDI agencies, thereby reducing the referral time of helpdesk staff.

Do a study to define and evaluate technical aspects of software used to aid the helpdesk, particularly for collecting and analyzing Internet statistics.

Sponsor demonstrations of the new customer support systems that various CENDI agencies have developed or purchased with a view to resource sharing.

Hold a session to update staff on the technical aspects of WWW development tools.

Prepare and hold a meeting to demonstrate the customer service pages of the CENDI agency WWW sites (and perhaps those of other agencies) to identify "best practices".

Convene a task group to discuss the various types of metrics and statistics that can be collected for WWW sites, how they can be interpreted and analyzed, and what are the most meaningful in this new environment.

2.0 IMPACT OF THE INTERNET ON PRODUCT DEVELOPMENT

The second workshop was held to share information and identify common concerns regarding the impact of the Internet on product development among the CENDI agencies. The design of products, the impact of the Internet on the product development life cycle, and the speed with which products need to be designed and then mature were discussed.

During the planning for the workshop, lead agencies were identified to give presentations on their experiences and concerns, and to lead the discussions of the group on that topic. The agenda developed for the meeting included a series of questions under each topic to guide the lead agency's presentation and the discussions (see Appendix B).

2.1 Product Design (Led by NTIS)

A major concern for NTIS was how to put the bibliographic database on the WWW as a product. The Order Now project is NTIS's introduction into electronic commerce. It allows the user to request a document and then provide ship to and billing information. The need for billing information means that accounting files must be maintained and there must be encryption for credit card transactions.

In order to make the Order Now system most effective, it was necessary to provide the users with some type of bibliographic database from which the user could start. (It is also possible to have located the NTIS accession (order) number in another system, but to order it through Order Now.) The decision to have a bibliographic database on the WWW raised two questions: 1) the type of search engine, and 2) the impact a WWW-based product would have on NTIS's current license agreements.

With regard to the search engine, the first important move was to procure Cuadra STAR as the database management system for the internal production system. This made the transition to the in-house electronic system easier. NTIS also purchased a Z39.50 compatible search engine, WAIS. It is not as robust a search engine as NTIS would like, but it does have a lot of front end help and menus to support the users.

Order Now online contains all bibliographic records added to the NTIS database in the past 90 days. It is updated each week.

Through this process, NTIS also discovered that they had a number of internal systems that didn't "talk" well. The components that needed to be integrated included the database, the inventory, and the distribution systems. NTIS is now working toward a more integrated environment.

NTIS also learned that development of a WWW version of the database has an impact on the presentation of the data. The public was unfamiliar with terms that are routinely understood by information professionals and central to the NTIS ordering process. The field tags used in the regular online product were modified for the WWW product. There are only 16 fields instead of 19. Unlike the vendor product, the field tags are spelled out. The term Accession Number was not used, because it was not understood by the WWW users. The category codes are available for users who know them. The price codes must be coordinated between the distribution and database functions in order to present the actual prices to the users, rather than the traditional NTIS price codes. Descriptors and

identifiers were merged into a single keyword field, because it is hard to determine when the terms go from general use to technical terms in common usage. The major versus minor descriptors were dropped in part because the indicator for major versus minor was the *, the same symbol used for truncation in WAIS. Document types were provided. The option of searching all fields or searching specific fields is provided.

The online ordering system requires that the WWW database "talk to" the Order Now system. An Oracle database was developed with only the indexing in WAIS format. This allows the Oracle database to talk to the accounting and inventory systems that are also Oracle-based. C, PERL and HTML coding are used to integrate the system.

2.1.1 Discussion: WWW-Based Search Engines

NTIS may migrate to another search engine. The study is being undertaken in the strategic planning area. In addition to other engines, NTIS is looking at RetrievalWare that is already used for the *World News Connection*. RetrievalWare is also used by NAIC. The RetrievalWare product was discussed briefly. There is a Federal RetrievalWare Users Group chaired by Tom Pedtke of NAIC.

NLM faces the problem of a home grown 25 year-old retrieval engine. NLM is dealing with a family of 40 databases and the main database, MEDLINE, has over 5 million records. They have investigated the Inquiry text database management system/search engine, but there are problems handling controlled terms. NLM is a government Reinvention Laboratory. This has helped to focus on these technology issues, and there are important studies underway at the National Center for Biotechnology Information (NCBI), where a new search engine for WWW access to the database is being developed.

It was noted that many of the WWW-based search engines reduce the value of the controlled vocabulary, because all terms are treated the same (as free text). Scalability and response time are also issues, along with precision and recall.

2.2 Product Design (Led by NTIS)

In contrast to the Preview product, a product developed strictly for the Internet, NTIS was also described in the *World News Connection*, that began as the Foreign Broadcast Information Service (FBIS) Daily Reports, went straight from paper to the Internet. The FBIS analysts monitor open source material. The FBIS Daily Reports were produced for intelligence analysts in paper organized by regions. There was also a series that centered on scientific and technical reports. The information took 48-72 hours from the point of foreign source publication to presentation in the daily reports. The time lag was due in part to the paper medium that was used. NTIS handled the non-FBIS distribution of the FBIS paper product through a subscription service.

FBIS requested internal electronic versions and a public version that NTIS would distribute. A five person team including database developers, information scientists and marketing people, was formed. This NTIS team was also supplemented by contractor and FBIS input. Another requirement was a profiling service that was more tailored to the individual analyst. The public version required a copyright agreement program that sets aside 25 percent of the income that is then reimbursed to the publishers based on the use of material from their sources.

In June 1995, the team held a focus group meeting to elicit the needs of customers. The focus group participants responded to screen mock-ups and identified factors that would determine if they would subscribe to the service. The focus group session used a series of networked PCS to anonymously display comments about the system on a big screen for all participants to see. The focus group was also asked about other competing sources, features, pricing and technology. The focus group participants were critical of the lack of indexing in the old paper product. They did not like the *World News Connection* title (internally it had been called FBIS Online).

Through the use of the Internet, NTIS is able to provide 24-hour access. It is priced as a flat fee service. They originally planned on a per hit/view charge, but the focus group members wanted a subscription. The major users are university area studies programs, international law firms, and the mass media. There is also a 7-day trial subscription plan for a very low fee.

It was necessary to develop three different types of search screens. A free text search screen is provided. A box called "Meanings" allows the user to pick the particular definition of the term in the search. You can also click on the checks for definitions if you want them. These search aids are based on RetrievalWare's semantic network capability. The weight of the terms can also be controlled. Another screen was developed to emphasize the original topic-orientation of the paper products. However, this improves on the paper version because topics can be combined.

The third screen is a structured Boolean search screen. The helpdesk gets a proportion of search questions, but not that many on other topics. Search Help and Sample Search aids are available. The results are ranked by relevancy. The display options are by source publication title or by publication date. A profile can be created and modified. The material is then provided daily, directly to this user's e-mail box.

FBIS uses the same interface as the public interface. The main difference is the sources that are covered. FBIS has a larger set of records available internally, because it is not necessary to establish copyright agreements and it includes government documents with distribution limitations, which the public version does not.

NTIS noted that it is imperative to be responsive to customer demands. For example, academic groups were vocal about their requirements for networked access. While NTIS was developing this access, university technical staff were creative in writing scripts to allow for broader access for their campus. Networked access to the World News Connection is now available and broadly accepted by the academic community.

The latest trend at NLM has companies leasing the MEDLINE tapes and serving them on the Internet free of charge. However, NLM is mandated to recover costs. There is an experimental system underway from the NCBI that provides information free from the NLM. The movement is toward providing access via the Internet. Some costs will go away, but not all the costs. This requires new models for charging for non-catalog services, such as document delivery and direct connections to the journal publishers.

2.3 Product Design (Led by NLM)

NLM developed Grateful Med software, primarily for use by non-information professionals, 10 years ago. Instead of the traditional DOS and Mac versions of Grateful Med, NLM is now focusing its efforts on Windows and WWW versions. The Internet Grateful Med, recently introduced, "talks" to the old MEDLARS search engine. However, NLM has developed a data model that is flexible and separates the interface from the process and the data. The Request Manager interfaces between the CGI script, the HTML of the interface and the mainframe search engine. It negotiates the process. It also maintains state, an idea of what the user has done previously, which is not available through the regular WWW browsers.

The development began about two years ago. The beta version was introduced last April. There was a significant amount of input from the libraries. Calls for beta testers resulted in 200+ interested individuals from various backgrounds. Beta testing lasted six to seven months. This testing was facilitated by the Internet through the use of a mail group. The Internet provided almost instant feedback between the testers and the developers. NLM is incorporating the use of the Internet evaluation form and listserv into the overall approach and development cycle for future projects.

The group identified a moving target problem. The users want new features, but development of new features may result in problems with the "look and feel" of the product on older machines and browsers. What looks good in one environment does not look good in another. There are things you can do in a WWW environment, for example windows within windows, that cannot be done in other environments.

The issue of user setable profiles was discussed. Tailored print commands and display formats that were previously maintained on the mainframe, must be handled locally on the disk. Java is one way to work around this problem by sending little executables to the client machine. However, this requires a browser that is Java compliant.

It was noted that the WWW provides a consistent interface, and removes the producer from the business of development and distribution of end-user software. The DOS and Mac versions of Grateful Med required mailing out disks once per year. As more users move to Internet Grateful Med, they won't need to do this. However, NLM will not drop the support for the older versions until the users have moved to the WWW. A recent study indicated that more users are moving to Internet access. (It was noted that the results of this Customer Service study on the use of the Internet by NLM customers was supplied by NLM to the CENDI Principals at a recent meeting.) The only updates currently provided in the DOS and Mac versions of Grateful Med are updates to the controlled vocabulary.

Another benefit of the WWW software is that it can be updated and new functions added immediately. Bugs can also be fixed more quickly. There have been 2-3 minor versions since Internet Grateful Med was released last April. New databases have also been added.

2.4 Discussion

2.4.1 Interface Development

NAIC developed a Java interface to RetrievalWare. It works with the front-end client of RetrievalWare. Any Java compliant browser can be used to access RetrievalWare through this

mechanism. However, NAIC has other versions of software for access. They have developed a Motif version that incorporates tools to visualize search results. The WWW interface to the CIRC bibliographic database will be introduced later this summer.

2.4.2 Development Teams

The question of who should develop the interfaces was discussed. NAIC found that the first attempt by the computer systems department had to be completely rewritten. That part of the project is now in the hands of the information specialists. A team approach worked well at NTIS.

2.4.3 Training Impact

A really good interface still requires some training and online help. The interface must be useable in vanilla WWW form and also tailored for the expert. NAIC noted that top management seems to be particularly happy with visualization tools.

2.4.4 Impact of Agents and Robots

The NLM has experienced problems with the number of hits taken by the server because of search agents being developed by or added-on to more advanced browsers and search engines. It is possible to build robot text files in a particular system area to control the impact of agents. However, not all agents are polite; those that don't read the robot text file can hit the server very hard.

2.4.5 Development Time

NLM noted that they are still trying to speed the development time for Internet-based products. Some aspects of development have sped up and others have slowed down. The critical path becomes the transitioning of a research project to the operational side of the house. There is less time to do this, yet it is more critical.

NTIS noted that the traditional modes of development and distribution were often dampers to innovation. For example, changes to formats and database structures require that the vendor be notified in advance of these changes. Innovation has intensified on the WWW because it is easier.

The ease of change, however, leads to a question of version control. When DTIC does incremental changes, they do not consider them new versions. NLM can port over bug fixes that also do not result in new versions.

2.5 Document Conversion/Presentation (Led by NAIC)

NAIC is an intelligence production center. The emphasis is on publishing for internal groups and related external DoD and intelligence organizations. There is, therefore, a need for a private encrypted Intranet.

The Open Source Information System (OSIS) is a "virtual private network". Any government agency can get access to OSIS. There are sites that are OSIS nodes and also firewall protection from non-node access. This Intranet is not connected to any public network. In 1994, NAIC began using

Intelink, a secure inter-organizational network based on Internet standards and protocols, for product dissemination. Intelink has reduced the volume of hardcopy production at NAIC.

DLIPS is the NAIC document conversion system that will replace the current CIRC database system. There are several automated components in the design including scanning, OCR, and machine translation. The concept is to enable online real-time source document delivery. It includes scanning, OCR, and a fuzzy search engine. The system also uses a Government-Off-the-Shelf workflow manager and Pentium workstations. The bound volumes will be scanned. A graphical user interface has been developed to separate larger publications into smaller units. Differences in the input formats and quality will require some clean-up work after the OCR process. The goal is to improve the system to handle more and more unattended processing. However, DLIPS will never be truly automated because there are languages that aren't available for translation. There is a distinction made between "just enough for searching."

As part of a redesign project, the record structure for CIRC was analyzed. The redesign is not vastly different than the old CIRC. NAIC has added some fields and made some previously mandatory fields optional. One new field is for the foreign language of the OCR. This is used to control the OCR software process.

NAIC is also investigating Gist-type products. Currently, the first 10 lines of the text are included in this field. However, they are evaluating InfoGist software that will do an extraction from the text itself.

There are several output filters, most notably SGML. The SGML will be filtered to formatted text or HTML for WWW presentation. NAIC has defined five views of the data.

RetrievalWare using an Oracle bridge will be used to handle the searching. Queries will be passed to the Oracle database. The motif-based Simple Query Tool was developed. It has five primary functions and 100 calls. Originally it was thought that the users only wanted a WWW interface. However, at that time, Java was not authorized for development. NAIC will retain the Motif-based interface and develop a Java interface, now that Java has been approved for use.

The AirShow brochures have been made available under OSIS. The user reaction has been very positive. The information has been scanned, OCRed, spell-checked, and then WAIS-indexed. The source to imagery scanning is done at 1200 dots per inch (dpi). The photographic pages are converted to JPEGS. A PERLscript creates thumbnails of the photographs for presentation on the OSIS screens.

2.5.1 Discussion

The group discussed the issues related to various electronic document formats. DOE indicated that DOE laboratories are converting many documents to PDF (Portable Document Format), since users continue to print out the documents to hardcopy. PDF preserves the look and feel of the original. However, PDF is proprietary and requires the Adobe Acrobat reader on the client machine. TIFF is the most common format for images. OCR-generated files are searchable. NAIC and DOE are incorporating SGML tagging at various levels to provide for fielded searching and identification of

bibliographic information. HTML conversion from these files is not difficult. New HTML authoring tools aid the process of dealing with texts written in common word processors. The group identified the provision of legacy documents in HTML as an issue. Also, links within the text must still be designed and often implemented manually.

2.6 Security Issues (Led by DTIC)

In January 1996, DTIC's overall system support was moved from the Defense Logistics Agency (DLA) to DTIC. A new ADP security position was established to provide guidance to the staff on network and other ADP security issues. The increasing security needs brought about by the Internet environment contributed substantially to this change.

DTIC hosts more than 80 homepages for DoD. When DTIC encountered security problems with one of its WWW sites, it decided to be proactive in this regard and hosted a federal conference on security for Webmasters. A videotape and the overheads of the conference are available. [The Webmaster/UNIX System Administrator Security Seminar (Video recording), $70.00, ADM 200 446; The Computer Criminal & the Internet (Computer Diskette) - $20 - ADM 200 444; Industry and Web Security - (Computer Diskette) - $20 - ADM 200 445; Unix and Network Security Tutorial - $6 - ADB 194 146.] Defense Information Systems Agency (DISA) and Air Force offices are willing to help with security issues.

The Attorney General's Office has prepared a videotape to advise on how to protect your WWW sites from break-ins and how to plan for damage control. A press release plan in advance is important. It is expected that many of these ideas will be incorporated in the Federal WWW Guidelines. A new version of the guidelines was issued on April 3. The WWW site is http:skydive.ncsa.uiuc.edu/cybrary/2/agency_policy.html

DTIC noted that Secure STINET will be a physically different node. Limited information is going to be available. A second log in is required for non-public documents. DTIC recommends including WWW security in the more traditional security training that is currently provided to employees.

2.6.1 Discussion

Periodic security audits are valuable. NLM has implemented a system whereby the public server will page the system administrator if there is unusual activity. NLM also hired a company to do a security check. DTIC also has outside evaluations and has implemented extensive security tools. During the fall of 1997, DTIC will be integrating the Automated Security Incident Measurement (ASIM) monitoring software into its network environment. This software will aid DTIC in monitoring for Internet intrusions 24 hours a day. Over the last several years, DTIC has contracted with two separate commercial vendors and a government activity in an effort to determine possible network vulnerabilities. The advances in electronic commerce will solve some of these security issues, but it won't solve the data security problems.

2.7 Online User Registration

Online registration is used by many agencies. A memorandum of understanding is provided to

potential NLM users. Because the user is providing credit card information, NLM requires a secure browser, Netscape 2.0 or Microsoft Explorer 2.0. Users who do not have these browsers have registered complaints. Users who do not want to register with their credit cards must use the paper registration forms. The processing and mailing of these forms takes at least a week to 10 days.

It should be noted that there is no encryption when the user is actually searching online. This is no different than when people searched using regular MEDLINE over the phone lines.

If the user wants to change his password, he must call the service desk. Free databases still require user IDs and passwords because statistics are tied to these elements. NCBI may begin requiring user IDs and passwords in order to provide more statistics (not just hits and statistics based on domains).

NTIS noted that they verify the registration information at the zip code level. However, they do not validate the credit card number. The cost and time to do an interactive validation is more than the loss when the credit card is determined at billing to be invalid.

2.8 International Users

The group discussed the impact of international users on Internet product development. Internet Grateful Med uses international credit cards and a browser for registering online. There is an effort to connect the required surcharge for international users to the firewall access. However, this still presents a problem for American citizens who work in a foreign country.

2.9 Statistics

While this was not intended to be a discussion on statistics, the group briefly discussed packages that can provide statistics from the WWW. Many acknowledged that the statistics were not detailed enough. However, there was also concern about the problem of privacy and whether or not these statistics constitute a FOIA-able government record. It was suggested that privacy issues are a tug-of-war that we should keep on our radar screens. We should keep each other apprised of these issues. What is the line between the requirement for customer service information, provision of government-generated information and personal privacy?

2.10 Recommendations

The following recommendations have been identified:

> Track the development of the Next Generation Internet and Internet II as well as keep product development staffs informed.
>
> Study the types of Internet publishing technologies that may supersede the WWW and how agencies can prepare for them.
>
> Discuss the impact of Product Development on the Internet. How can the needs of the agencies for security, formalized commerce, visualization, vocabulary aids, improved search engines, and increased bandwidth be expressed in order to shape the future of the Internet?

Appendix A

Agenda

CENDI User Education Workshop

Impact of the Internet on Product Development

April 8, 1997

CENDI

DOE Forrestal Building

MEETING AGENDA

CENDI USER EDUCATION WORKSHOP

IMPACT OF THE INTERNET ON PRODUCT DEVELOPMENT

April 8, 1997

8:45 Registration

9:00 Welcome (*Cheryl Hunter*)

9:15 Product Design (Lead agency: NTIS)

How does the producer determine customer requirements, which products to make available and how resources should be expended (particularly when a COTS product or multiple agencies are involved)? How should new products be positioned with other Internet products, other online products of a conventional nature, and traditional paper/other media products? How do you adjust the product development cycle to make sure that your product isn't obsolete before it is introduced because of rapid changes in related technologies such as search engines, WWW browsers and agents? Who should design the end user interfaces: computer/systems people or information professions? How does the producer ensure that end users can access its product; i.e., has the necessary hardware and software? How do you keep the product up-to-date? How does the Internet impact the product life cycle (how long it takes a product to mature in the market and how quickly it begins to decline)? How can agencies respond to this impact?

11:30 *Lunch on Your Own - DOE Cafeteria*

12:30 Document Conversion/Presentation (Lead agency: NAIC)

What are the pros and cons of various electronic document formats and what is the most efficient and effective means of conversion/presentation? How do agencies deal with the difficulties of converting documents to electronic format; i.e., "HTMLing" documents (keeping up with the workload, etc.)? What difficulties are agencies encountering when putting up full-text documents? How can errors or changes that result from the conversion process be handled? How does this effect version control and document life cycle management? How do we take advantage of the Internet's ability to handle distributed and linked documents within the limited resources available?

2:00 *Break*

continued

2:15 Security Issues (Lead agency: DTIC)

What security issues have been raised when dealing with information over the Internet and how have security demands been met? Have firewalls been effective? What has been the impact, if any, of dealing with customers on an international level? Are there any negatives repercussions in denying access to customers due to security concerns? How are agencies dealing with this? What issues have agencies faced when setting/up handling credit card transactions over the Internet?

4:00 Wrap Up and Final Discussion

4:30 Adjournment

Appendix B

Agenda/Questions

CENDI User Education Workshop

Impact of the Internet on Customer Service

February 4, 1997

AGENDA

CENDI USER EDUCATION WORKSHOP

THE IMPACT OF THE INTERNET ON CUSTOMER SERVICE

DOE Forrestal Bldg, Room 1E-267

Washington, DC

February 4, 1997

8:45 am Registration

9:00 am Welcome and Introductions

5 min. for each agency

Brief Overview of Each Agency's Helpdesk and Customer Service Functions (using questions from the Helpdesk Survey with an Internet Slant as deemed necessary)

9:30 am Who to Serve?

- Is there any prescreening done or are Help Desk staff the first line of defense?
- How are "authorized" users determined? Is there any formal policy in who must, should and/or might be served? Is there a list of who NOT to serve?
- What is the level of service provided to government versus public customers?
- How do you handle various levels of urgency? How do you prioritize requests?
- Is there a designated amount of time for helping each customers, after which the Helpdesk person has to cut off the inquiry? Are there informal cutoff points? How were these cutoff points determined and how is that handled with the customer?

10:45 am *Break*

11:00 am Using the Homepage

- FAQs - using them to manage your workload
- How to develop? What kinds of links are there? Are FAQs at the front page as well as the Help Desk Homepage?
- How are agencies using the Internet (or their local Intranet) to make self-help or online help available to their customers?

12:30 pm *Lunch and Networking - DOE cafeteria*

2:00 pm Using Technology to Support the Helpdesk

- Intranet solutions using telephone/fax/email addresses for contacts within the organization.
- Collecting feedback via the Internet.
- Using technology to log and analyze user questions/comments

- Providing information for helpdesk problem solving (databases and knowledge bases)
- What kinds of statistics do you collect and how do you collect them?
- Quality vs. Quantity — Quality depending on amoung of time to spend, how much outreach given, etc.
- Statistical and efficiency reports — Options for improvements

3:30 pm Break

3:45 pm Review of Possible Cooperative Efforts

4:30 pm Adjournment

Department of Energy, Forrestal Bldg., 1000 Independence Ave., SW, Washington, DC 20585

Take the metro to the Smithsonian stop. Exit the underground via the Independence Avenue exit. At the top of the escalator turn right. The Forrestal Building is located approximately 1½ blocks. Enter the building via the Visitor's entrance. Proceed to the security desk. There are separate sign-ins for government and contractor personnel. Please have picture ID available. Tell them that you are attending the CENDI meeting and that your contact is Barbara Bauldock at Ext. 6-5666 or Deborah Nance at Ext. 6-8842. The room is located on the first floor in Hallway E. If you plan to drive in and want to reserve a parking space in the DOE garage, please call Deborah Nance at 202/586-8842 by Tuesday, Jan. 28, 1997.