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Intranets, which have established their place in corporations, often outgrow their original scopes and become difficult to maintain. Navigation, organization schemes, and labeling are common issues. This paper is a case study of how one newspaper's intranet used information architecture techniques – including user interviews, content analysis, card sorts, blueprints, wireframes, and usability testing – in the redesign process.

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BRINGING ORDER TO INTRANET CHAOS
WITH INFORMATION ARCHITECTURE: A CASE STUDY

by
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Introduction

Corporate intranets have a tendency to grow out of control. Many of them are started by one person or one department, then, in response to user requests, content is added in an unsystematic fashion over time until it becomes difficult for users to find what they need. When the sites are redesigned, it is often cosmetic, without consideration for the site's usability. Having a usable intranet is important to companies for several reasons – the most important being to save the company time and money by making employees more productive and efficient. Research has shown that it is almost always cost effective in the long run for companies to spend time and money investigating user needs and testing prototypes before building a site in order to ensure its usability (Rosenfeld 335). This study is a case study of one newspaper's intranet. The newspaper applied information architecture techniques in the redesign of the intranet – including a content audit, user testing of the existing site, personas, card sorts, and finally a usability test of a prototype. Findings in this case study will be applied directly to the newspaper's intranet redesign project, but the methodology could be applied to other intranet or extranet projects.

Poor information architecture on websites – and intranets in particular – is common. Jakob Nielsen's organization, the Nielsen Norman Group, has conducted extensive intranet usability studies and found that “most intranets are chaotic collections of documents that cannot be navigated” (Nielsen “Intranet Portals”). Nielsen goes on to say that efficiency, memorability and error reduction are the most important usability

traits for intranets; and that the top three infrastructure components are news, search and a directory hierarchy (Designing Web Usability 276).

Alison J. Head, who performs usability studies and design work for clients, agrees with Nielsen's assessment of the state of intranets. "Many Web and intranet information sites are crazy quilts of whimsical design, patches of disjointed content, and jumbles of color – all loosely stitched together with a score of indecipherable links," she writes in "Web Redemption and the Promise of Usability." "But a redesign is not always a sure remedy" because redesigns rarely focus on improving the usability of sites (21). Nick Throp, a communication consultant, says it is common for intranets to grow haphazardly, often because they are started in different departments and then merged together. To improve intranets, he says, it is necessary to change the focus to user needs (6). He suggests a user experience audit by a usability expert, along with testing actual users to see how well they perform a series of scenarios.

A recent article citing a study of more than 250 companies in five industries discusses trends in intranets over time. One of these trends is that intranets are often started by different departments within a company (Lamb 70). While implementing a single corporate intranet is considered a primary goal by many, some companies allow multiple intranets to continue, mainly because employees resist incorporating them into one (71).

The Ford Motor Company's Research Library and Information Services regularly revised their site every six to 12 months in the early 1990s, making hundreds of minor patches. In 1997, they realized, however, that they had not stopped at any point to consider their users and their users' needs then and in the future. They started discussing

the site's design in staff meetings and listening to users' comments at the reference desk and in e-mail messages (Varnum 53). Based on what they learned, they decided to do several things: create a subject organization, create a way for users to customize the site for their individual preferences, introduce a clean and consistent graphic interface, and move from static HTML pages to database-generated pages. "Developing the basic intellectual underpinning of the entire site was the single most important part of the design process. If we got the organization right, we felt the site would be easy to use and maintain" (54).

The purpose of this research is to describe one case study of an intranet redesign. The case study most similar to the study being proposed was a master's paper about usability testing of a corporate intranet by Beth Fowler, written in 1998. That paper applied usability techniques and testing to the redesign of a corporate intranet. It included interviews, heuristic evaluations, and user testing of three iterations of a design. It looked at ways users thought the design had improved over the course of the tests and attempted to uncover design principles that could be applied to improve the design of intranets for improved usability. Results of the study were goals for the site based on interviews with managers; the results of the heuristic evaluation; and quantitative and qualitative data from the usability tests. Iterative user testing of the redesigned site was shown to improve usability (68).

Literature Review

Newspaper Intranets

A survey of nine newspapers that had intranets in the United Kingdom determined that they were used for three main purposes there: 1) as a way to get the paper's archives

to the staff; 2) as an editorial intranet to get not only the archives, but also links and fact files, to the staff; and 3) as a company-wide intranet, with sites for all departments including editorial, research, human resources and production (Drennan 270). “The main or original purpose of all of them is to provide information for journalists to assist with the writing of articles and features, and the majority of the intranets do not cater for the whole staff of the company or contain company information,” Drennan writes. “The situation looks likely to change in the future, as several newspapers are contemplating creating a company-wide intranet.”

Newsroom intranets, as one might expect, have many of the same problems as intranet sites in general. It is noteworthy that none of the UK newspapers carried out needs assessments of their journalists before embarking on their intranets because they felt they already knew their staffs’ needs (Drennan 270). Most of the UK papers plan to make their intranets company-wide and, following content and design guidelines, departments will be able to contribute information to the site (271). Only two of the papers had one person overseeing the intranet. All the papers saw the time it takes to maintain intranet content as a problem (272). There was also agreement that keeping content to a manageable level would continue to be a challenge. “It is an area in which user needs analysis could help in decision-making; users know which types of information they find most useful, and intranet developers can build on this knowledge to create systems of the most relevant material” (273).

Scottish Media Newspapers took advantage of internet capabilities in 1989 to start an intranet that would provide access to the newspaper’s archives on employees’ desktops. This did not work as well as the company had hoped it would, however,

because reporters and editors were not used to the command-line interface (Watson 4). In 1995, the archive system moved to a web interface, and was more compatible with reporters. “Desktop access to the archive using a friendly GUI has not only been a major boon to the journalist, it has also freed library staff from a certain amount of routine searching, allowing them to concentrate on the management of information resources” (4).

The Atlanta Journal-Constitution is an example of a paper with an intranet that started small – as a collection of Web links arranged by topic – and kept expanding. “We added things to it: internal resources, policies, procedures, training, contacts, anything we could think of that would be useful,” as well as commercial databases such as WilsonWeb and the Encyclopedia Britannica, and internally created databases about topics such as disasters (Pack 17). There was no single person in charge of the intranet; instead, the library staff members share the responsibilities. The news library was the first to have an intranet (to serve the newsroom), and then other departments started their own intranets with the help of the news library. “We’ve written a proposal for a plan to develop a corporate intranet,” she said.

At the San Antonio Express-News in Texas, a similar situation took place in the late 1990s, Toner writes. An information-services editor created and rolled out a newsroom intranet that allowed newsroom employees to tap into the newspaper’s archive and other resources. After that, she convinced the human-resources managers to invest in a company-wide intranet. The various departments then created their own sites, becoming the main way of interdepartmental communication and saving the company at least \$70,000 in printing costs its first year. “Such is the way intranets gradually work

their way into newspaper operations,” Toner writes. “Organic by nature, the networks often grow like kudzu. After being planted in one department – say, the newsroom, as a means to access archives – networks spread into other departments. And, like kudzu, their growth can even supplant original, mission-critical applications.”

With a primary goal being interdepartmental communications, the Express-News’ intranet includes a searchable phone book with photos and biographies, clickable maps to see who works where in the building, forms, and morale-boosting information such as awards won by people in different departments. Eight public-access terminals in break rooms allow production workers and others on the third-shift to have intranet access as well. And because maintaining intranets is often a challenge, especially when no single person is dedicated to the task, the Express-News’s news library hired a full-time person to be the site’s editor and webmaster, with some news research duties.

The Research and Information (R&I) Unit at the Guardian/Observer newspaper in London offered what is known as a Computer Assisted Reporting (CAR) intranet, which is separate from the main corporate intranet (Martin 162). This intranet, ResearchNet, provided content to help newsroom employees write articles first and foremost. It offered links to information gateways and Web sites organized by subject areas, such as “Accidents and Disasters,” “Crime and Law,” “Facts and Reference,” “News and Media,” and more. The unit’s employees, who were new to web skills, constructed the site by hand using HTML. After a time, however, the simple site adopted the design of Guardian Unlimited, the newspaper’s Web site. The idea was that if the design was similar, employees would more easily find their way around. The redesigned site featured the R&I logo on every page, to market the department. The primary goal of ResearchNet,

however, remained providing access to sites “that would be useful to journalists for research purposes” (162). In fact, some information formerly on their ResearchNet, such as nearby restaurants, was moved to the main corporate intranet.

ResearchNet offered access to the site’s information in different ways from the home page. Down the left side of the page was a list of questions such as “Need Internet training?” and “Need a Sidebar?,” allowing users quick access to useful information. Another box called “Useful Stuff” contained chronologies of major events, training guides, and a useful section called “Tracking people down.” There was also a set of quick reference links to frequently used sites such as phone books, directory information, an encyclopedia, and a currency converter. There was also a place for “What’s new on the intranet,” where they could feature new content. A search feature was planned, but was not possible at the publication time of the Martin paper, so a site map was used instead to help users find information. A blue column down the left-hand side of each page indicated the library holdings as they related to the topic shown (163).

The R&I did have a major regret about the intranet, though: “there is no facility for evaluating the use of ResearchNet.” As it turned out, there was confusion among staff about the difference between ResearchNet and Editnet, the editorial intranet on which ResearchNet sat. In addition, many people did not know what an intranet was (164). The unit discussed compulsory training for all employees, but this idea was not greeted well by employees. “The inference is that reporters will pick these things up as and when they need to” (164).

Information Architecture

Information Architecture for the World Wide Web by Louis Rosenfeld and Peter Morville examines the four main categories of information architecture, which are organization systems, labeling systems, navigation systems and search systems. In addition to those primary components, information architecture addresses the ideas of browsing aids, search aids, tasks and “invisible” components such as thesauri.

There are different types of organization schemes, including exact and ambiguous schemes. Exact schemes are alphabetical, chronological and geographical (Rosenfeld 56-57). Ambiguous schemes include topic, task, audience, metaphor, and hybrids (57-64). Exact schemes are useful when users will be performing known-item searches because they make it clear where to find information. “The problem with exact organization schemes is that they require the user to know the specific name of the resource they are looking for. The white pages don’t work very well if you’re looking for a plumber” (56). Ambiguous organization schemes, on the other hand, can help people who don’t know exactly what they are looking for find information. They “defy exact definition” and can be difficult to design and maintain. “While ambiguous organization schemes require more work and introduce a messy element of subjectivity, they often prove more valuable to the user than exact schemes” (59). Whenever possible, Rosenfeld and Morville recommend using a combination of the two schemes, considering what will work best for a particular audience.

Van Djick also discusses several organization schemes, including time-based, subject-based (or topic-based), and task-based (80). An example of time-based organization is news articles grouped by date. An example of subject-based organization

is news by Sports, Local News, Features, etc. An example of task-based organization includes tasks such as searching, e-mailing, and so on. A combination of schemes is often used in a website. Once the organization scheme has been chosen, developers define categories and determine the actual words, or labels, that will be used in the categories.

Rosenfeld and Morville also discuss different organization structures, including hierarchy, database and hypertext models (65-72). Hierarchy models take a top-down approach such as a family tree; database models take a bottom-up approach similar to a Rolodex, and rely on metadata; hypertext models take a non-linear approach where “content chunks are connected via links in a loose web of relationships” (73). Intranets typically require all three types of structure, the authors say. They recommend that the top-level, umbrella architecture be hierarchical in nature, and suggest the database model for sub-sites (70-71). Less structured relationships can be handled through hypertext, which also allow designers to point to the same information from different pages and different categories (Reiss 121). Together they form a cohesive organization system.

Labeling, which refers to the actual words used in the site’s contextual links, headings, navigation system choices, and index terms, is another important category of information architecture. “Labels are often the most obvious way of clearly showing the user your organization and navigation systems” (Rosenfeld 76). Navigation systems, the next category of information architecture, include global, local and contextual systems. Global navigation is intended to be present on every page in a site; local navigation appears on pages in a particular area; and contextual navigation, such as “See Also” links, does not fit neatly into the other navigation schemes. The navigation system gives users a

sense of where they are and where they can go. Supplemental navigation systems include sitemaps, indexes and guides.

The final information architecture system is Search. It is helpful to have a Search feature when there is too much information in a site to browse, Rosenfeld and Morville say (134). It should also be available because users expect it to be there. “Users won’t always be willing to browse through your site’s structure; their time is limited, and their cognitive overload threshold is lower than you think... But perhaps most of all, users expect that little search box wherever they go. It’s a default convention, and it’s hard to stand against the wave of expectations” (135). Search features usually involve indexing the site’s contents in one or a variety of ways. It is also important to provide results in a meaningful way, explaining where the results came from and offering suggestions for improving the search when possible.

Martin White has his own, simpler definition for information architecture. “To me, information architecture is the process of designing the access to information so that users can rely mainly on their intuition to navigate quickly and productively around the site” (46). He says this easy navigation can tend to be a particular problem on intranets, which are often created, at least initially, without clear objectives and which often suffer from content being added without clear thought about the overall structure of the site. Intranets are too often developed around an organization’s structure, which makes it difficult for users to know what information will be where. “Even for long-term employees this can be a problem as departments change their names and responsibilities, but for new employees it’s too much of a challenge” (47). White stresses the importance of usability testing with real users on intranets.

Elaine G. Toms offers this definition of information architecture: “In essence, it enables access to a content by providing a systematic and primarily a visual approach to the organization of content and thus facilitates the quest for information.” Her article discusses how information architecture helps facilitate information interaction.

“Information architecture is a blueprint for the information system in Web sites or other information-rich systems,” she writes. “As such, it contributes significantly to the information interaction – the way that a user interacts with the content of a Web site” (Toms 860).

Several techniques are used to discover how information architecture can be used to improve users’ interactions on particular Web sites, including content analysis, user interviews, card sorts, and wireframes and blueprints. Content analysis involves thoroughly reviewing what currently exists in the site. A high-level content survey is useful for learning about the scope and nature of the site’s content (Rosenfeld 221). Typically, reviewers keep track of formats, document types, source, subject, and existing architecture. One benefit of the content analysis is that reviewers become thoroughly familiar with existing content; however, the main purpose is to get data that will help in the development of an information architecture. At the same time, it is very useful to collect usage statistics that show how people have been using the site and where they have had difficulties.

User interviews help designers understand users’ priorities and needs with respect to the site (Rosenfeld 234). There are many ways to study users, including interviews, focus groups, watching people in their natural settings, surveys and user testing. There is no one right way to learn about your user population – and it’s best to use more than one

approach when possible. Rosenfeld says it is important to remember that any user data and testing is better than none, and that users can be powerful allies. “It’s easy for colleagues and your boss to argue with you, but it’s difficult for them to argue with their customers and with real user behavior. User research is an extremely effective political tool” (227). Part of analyzing users also includes analyzing usage statistics about how users use the current site.

Personas are descriptions of archetypical examples of a target audience. They are given fictional names, photos, and characteristics, but they have real scenarios that are typical of that user group’s goals for using the site. Personas can be useful to refer to throughout the design process as reminders of user groups’ primary tasks.

Card sorting involves labeling index cards with headings from categories and content from the site, and getting users to group them. This exercise can help clarify how users think items should be grouped. In open card sorts, users create their own labels for the categories they create, and in closed card sorts, users place cards into existing categories. “Open card sorts are used for discovery. Closed card sorts are used for validation” (235). Card sorts can be used to help determine the primary hierarchy of a site, or alternate navigation paths. In addition to keeping users’ comments, it is useful to keep track of the percentage of time that users group certain cards together, and the percentage of time that users place a specific card in a specific category. Caution is required, however. Van Djick does suggest card sorting as a way to help come up with categories, which can then be worked into hierarchies (88).

“Card sorting is not an evaluation technique and will not tell you what is wrong with your current site,” write Donna Maurer and Todd Warfel of the website Boxes and Arrows (Maurer). “Card sorting is not a silver bullet to create an information structure. It is one input in a user-centered design process and

should complement other activities such as information needs analysis, task analysis, and continual usability evaluation.” Also, “Card sorting will provide benefit to most sites, but can be challenging to use against some sets of information,” such as that on intranets. For those sites, “card sorting will provide less direct input into the information structure; you may need to undertake a range of card sorts and more user-centered design activities.”

Once information is gathered, blueprints and wireframes can be developed to organize the elements of the site. Blueprints show the relationships among pages, and wireframes show the layout of individual pages. These are useful for mapping out the organization, navigation and labeling systems for the site. Finally, usability testing is an important aspect of information architecture because it provides feedback based on users’ interactions with a prototype to be incorporated into the redesign process.

Usability Testing

No amount of work up front can replace the value of usability testing of a prototype with actual users, which van Djick calls “the bread and butter of research techniques” (58). The practice is highly recommended by both information architecture professionals and usability experts. Usability testing is best done as early as possible in the design stage so that changes can be made to address any problems. It is best to have iterative testing throughout the design process. Usability testing can range from low-fidelity tests using pencil drawings on paper to high-fidelity tests using a semi-functioning website. The main benefits of low-fidelity testing are that it is inexpensive and does not take much time to do. The benefits of high-fidelity testing are that it is a more effective way to test such features as navigation and links because users will actually be able to use them.

According to usability expert Jeffrey Rubin, there are four types of usability tests: exploratory tests, assessment tests, validation tests, and comparison tests (30). An exploratory test is conducted early in the site development, when ideas for the site are being considered before the design phase begins. The main objective is to explore the design concepts. Assessment tests are conducted early or midway into the product development cycle and are used to build on the findings of the exploratory test. Validation tests are conducted late in the development cycle and are intended to verify that the product is usable. Comparison tests can be used at any stage to compare the usability of two or more alternate designs. This study will use an exploratory test.

Early analysis is considered important because this is the point when critical decisions about the site are made. “If the project begins with wrong assumptions and faulty premises about the user, the product is almost guaranteed to have usability problems later. Similar to building a house, once you lay the foundation for one type of model, you cannot simply build a totally different model without first ripping out the existing framework. The underlying structure determines all that will follow” (Rubin 33). For an exploratory test, the prototype need not be fully functioning; it just needs to work well enough so that users can accomplish test objectives. Users are often asked to perform a series of tasks to see how they navigate the site, and to talk aloud about their thought processes so that test monitors can understand their difficulties. Exploratory tests are often conducted as comparison tests, with different designs being tested. This helps designers form designs before moving forward with any one design.

Although Nielsen, in “Why you only need to test with 5 users” suggests that five users will catch 80 percent of usability problems in any given usability test, the

overriding guideline, according to Rubin, is that “you cannot have too many participants,” especially in experimental studies (93). Rubin concedes that for less formal usability studies, four to five participants will in fact expose 80 percent of usability problems, and that they will cover most of the big problems. “Of course, if you have the time and resources to study more than four or five participants, by all means do so. It is possible that the additional 20 percent of deficiencies you might find could be important for your product” (93).

According to Brinck (423), the major steps in any usability test are as follows: 1) plan the test; 2) assemble the materials such as consent forms and questionnaires; 3) prepare the testing room and any equipment; 4) test one or two co-workers first to work out bugs; 5) select users and schedule them for testing; 6) conduct the tests; 7) analyze the results, prioritizing problems and offering possible solutions; and 8) fix your site and retest, either once or several times. It is important during testing to get users to talk aloud so that you can understand their thought processes and take notes on them. “Evaluation is a critical component of every phase of design. It raises the quality of your design and keeps costs under control by preventing the design from drifting off track. User testing, in particular, is an extremely informative approach to involving users in design evaluation” (Brinck 441).

Nielsen says that “user testing with real users is the most fundamental usability method and is in some sense irreplaceable, since it provides direct information about how people use computers and what their exact problems are with the concrete interface being tested” (Usability Engineering 165). He suggests that it is important to set goals for testing and choose an appropriate type of test; get representative test users; choose the

people to run the test, considering biases; consider the ethical aspects of tests with human subjects such as confidentiality; create representative test tasks; prepare for the four stages of the test – preparation, introduction, the test itself, and debriefing; and performance measurement.

Purpose of study

The News & Observer Publishing Company in Raleigh, N.C., has maintained an intranet since the mid-1990s. The company's News Research Department (known as NeRD) started the site as a simple set of links to the archives and to external Web sites by subject area. It has evolved over time to include much more information – and more links from the home page. The NeRD pages were created for the newsroom, and afterward other departments created their own intranet pages, each with its own look, and asked that the NeRD pages link to their pages – and also to specific links on their pages. The NeRD pages have undergone several minor redesigns over the years, but those redesigns have not included information architecture methodology or a major overhaul based on users' feedback. The existing site did not have a consistent look and feel, labels were often inconsistent or nonexistent, and there was no navigation system (Appendix C).

In the summer of 2004, The News Research Department realized that its intranet had grown beyond its scope and needed to be redesigned. The major problem was that people had difficulty finding information. The department wanted information about improving the information architecture and adding navigation and organization schemes to the site. They decided that because some of the major concerns with the site were organization, navigation and labeling, it would be useful to apply information architecture techniques as part of the redesign effort. This would specifically include a

content analysis, user interviews, creation of personas, card-sorting exercises, development of blueprints and wireframes – and, finally, usability testing of a prototype or prototypes. At the same time, the web design team planned to address issues that are common to newsroom intranets, such as the purpose of the intranet, the scope of the intranet, responsibility for maintenance, and whether the intranet should be newsroom-wide or company-wide.

This study is significant because, while user needs assessments have been rare in the redesign of intranets, applying information architecture techniques has been rarer still. These techniques apply to an intranet redesign, however, because they address many of the problems of newsroom intranets, especially organization, navigation and labeling problems. An important aspect of information architecture is including users in the design process by interviewing them about the current site, involving them in card sorts to help determine the organization and labeling, and having them test the redesign before it is implemented.

The new study will be different from the most similar case study, Fowler's study of a not-for-profit hospital and medical service corporation, which included user interviews, a heuristic evaluation of the current site, and three rounds of usability testing. Instead, this study focuses on information architecture techniques, and included only an informal heuristic evaluation, and only one usability test due to the time constraints of this study and the redesign team.

Redesign Background

In the summer and fall of 2004, the News Research Department collected data from newsroom reporters, editors, designers and researchers in a variety of ways – including user interviews and card sorts – with the goal of having as much information to draw from as possible for the redesign effort. The content analysis, user interviews and card sorts yielded various results with regard to data collection. In addition, blueprints and wireframes of the site were created to map out the site layout and pages.

The content analysis helped the redesign team see what content existed, get a sense of what could be eliminated, how the labeling could be improved (especially with regard to consistency), and who, if anyone, was maintaining what information. A typical procedure analyzing Web site content is entering page id numbers, page titles, and other page information into a spreadsheet, and then making notations about the pages. The redesign team decided to take a different approach and print all the major pages in the intranet and keep them in a binder, making comments on each of them. They marked items as redundant, outdated or trivial to help them see what needed to be removed or better maintained. Because many pages were long, they also indicated links and other information that could be removed or moved to a separate archive so that information could be found if needed, but it would be out of the way of more timely and relevant materials. The content analysis also helped the team view the content critically and find patterns in the site. For example, they decided to move much of the locally written and compiled information (such as major North Carolina airplane accidents and hurricanes, and information about local officials) to subject area pages. At this point, web server logs

also would have been analyzed to get an idea for how employees were using the site, but such logs were not available.

Early in the information gathering process, users were asked what they used most on the intranet and what suggestions they had for improvement. In addition, they were asked to perform a series of common tasks. The user interviews yielded qualitative data, and the tasks yielded both qualitative data (user comments) and quantitative data (number of users able to complete each task and how many users said they regularly used various features of the site). Information from the user interviews was used to create fictional personas that represented archetypal users of the site – one each for editors, reporters, copy editors and researchers – that included typical tasks that user group performed on the site.

The nine users who were interviewed and performed tasks on the existing site revealed the following information:

- **Most often-used features:** staff phone numbers, MediaSphere (the newspaper's archives), Factiva (an online database), forms, general reference, and Facts & Contacts (a section featuring locally generated information about topics the newspaper covers).
- **Easy tasks:** Finding staff phone numbers and the newspaper archives (both on the home page).
- **Difficult tasks:** Finding the newsroom ethics policy (in part because Policies was not one of the titles in the Newsroom dropdown menu) and the online card catalog.
- **Different paths:** Users accomplished certain tasks in a variety of ways, including phone numbers (Reference USA, Switchboard.com and phone book) and the

population of Garner, N.C. (newspaper archives, Google, Facts & Contacts and <http://www.Census.gov>).

- **Requested features:** Search, news feeds (especially for North Carolina papers).
- **Negative comments:** Users noted that they were often overwhelmed by the large amount of information on intranet pages. A few also pointed out that they used to use Facts & Contacts more often, but because the information was often outdated, they had stopped using it.

“This alone (the user interviews), in my opinion, was the single most effective thing we did,” one redesign team member said. The team found the user interviews informative and were surprised by certain information, such as how important graphic request forms were to users, and that the way the phone number information was organized was confusing to people. They did not find the personas particularly useful, however, because they felt they already kept the newsroom’s needs in mind, especially after the user interviews. “If we had a user group for the NeRD pages that we did not work with regularly (maybe the folks from circulation, display advertising, or another N&O department), personas might be more helpful.”

For the open card sort, 11 employees were each asked individually to take 73 index cards with labels being considered for the home page that included specific databases, directories, company departments, stylebooks, policies, news items, associations, newspapers, and news events, sort them into logical groupings, and write a label for each group. The sort, which was intended to get a sense of how users grouped information overall, yielded data about how users thought various areas should be labeled and grouped. All the data from each individual’s card sort was entered into spreadsheets

that analyzed the results and illustrated which items were grouped together and how often. One concern with the card sorts could have been that people were too familiar with the existing site and have a hard time thinking outside the box and coming up with their own labels. This was addressed by including a large number of participants in the sorts.

Here is a summary of some categories for which there was general agreement:

- **Departments:** Circulation, Advertising, Marketing, Information Services.
- **Newsroom Guides:** Stylebooks.
- **Newsroom and Professional Development:** A distinction was clear between which items belonged under “Newsroom” (ethics policy, newsroom news) and “Professional Development” (Poynter Institute, Columbia Journalism Review, Grammar Training).
- **Forms or Employee Tools:** Forms, expense reports, and conference room signups.
- **Archives:** Mediasphere, Factiva and Newsbank.
- **Databases:** Voter registration records, property records, social security database and tax records.
- **Demographics:** Log in to North Carolina, Census.gov, North Carolina State Data Center.

Although the department used information from the card sort to create labels on the front and internal pages, it was seen as the least helpful step, perhaps because it did not provide a clear sense of the categories needed to construct the site’s navigation. “I had really hoped we could get some clues for labeling, but at times the reporters' labels and categories seemed to cancel each other out,” a team member said. “Perhaps we could have focused on just one section rather than the front page items.”

When the redesign team drew up their blueprints and wireframes for the intranet, and by extension the prototype, they took into consideration what they learned during the content analysis, user interviews, and card sorts. In doing the content analysis, they found new ways to group information logically as they became familiar with its contents. Based on the interviews, they made a point to include information that the users used often and wanted to have accessible – such as forms, archives, local information, demographics information, phone numbers, and a Search feature – on the home page as task facets, giving users different paths to information. They used information from the card sorts to help determine the labeling, categories and navigation – including having “Research Resources,” “Newsroom,” “Professional Development,” and “Company Resources” as part of the main navigation. And they used the knowledge that people want shorter, simpler, “chunked” pages to reorganize internal pages with categories from the card sort, such as “Databases,” “Statistics,” “Web Sites” and “Guides.” “The blueprints/wireframes were useful to me in wrapping my head around how things will relate to one another, and where things should go on the site,” one redesign team member said.

It was strategically important to keep links to the non-news departments on the intranet – and it was clear from the card sorts that users understood the departments to be a group. On the existing site, however, the information about other departments took up a good deal of real estate at the bottom of the page, contributing to clutter. In the prototype, the departments were moved to the top of the pages both so that they could be included subtly and so that other departments could potentially use the same template to create a more cohesive corporate intranet.

The team also considered several other ideas for the intranet, some of which they dismissed and some of which they planned to implement later. They planned to implement a Search system, and were researching options. They also hoped to implement RSS (Really Simple Syndication) feeds, but were having a difficult time finding them for other North Carolina newspapers. They also considered offering personalization so that employees could set up the home page with features they use the most; that idea was discarded because the redesign team did not think enough users would use that feature to make it worthwhile. The ideas of a content management system and web database system also were considered but discarded, mostly because they would be difficult and costly to implement. Instead, the department purchased Macromedia's Dreamweaver application, and the site designer was sent to classes to learn it. The team is considering purchasing Macromedia Contribute licenses so that various employees could have the rights and ability to add content, taking some responsibility for maintenance off the News Research Department and making users more invested in the intranet.

Usability Test Methodology

The usability test served to test the effectiveness of a prototype of the new site (Appendix D), which was created using a Dreamweaver template and posted on a company web server. A news researcher who was a member of the redesign team selected subjects for the usability test non-randomly, but with attention to achieving diversity with regard to age, sex, length of time at the newspaper, job and estimated time spent using the current intranet. The test-takers break down as follows: two men and seven women; two editors, two designers, three reporters, one copy editor and one news

researcher. There was a range in length of time at the newspaper and estimated time spent using the current intranet.

The testing was held in a small conference room at the News & Observer with the principal investigator (the author), the site designer, and the participant. Each participant read a confidentiality statement (Appendix A) that explained that his or her individual comments would not be shared with anyone outside the testing room. Instead, only summary data would be provided to the design team after all participants had completed the test. It also explained that the screen and their voices would be recorded with a video camera during the testing process so that the principal investigator could review them later. The site designer signed a confidentiality form agreeing not to discuss individuals' comments; she also did not interact with participants during testing because her connection to the site might make her inclined to help users find information rather than remaining neutral as they searched.

The purpose of the exploratory test (Appendix B) was to see how well users were able to find information on the redesigned prototype. The tasks included several that users had difficulty with in the testing of the existing site. Other tasks were added to test some of the ways information had been reorganized, such as moving much of the Facts & Contacts information into subject areas. Separate questions asked users to rate the navigation, organization and labeling systems to gauge how users felt about them. The results of the test would be used to make changes to the site before the actual design was implemented.

The usability test resulted in qualitative information about how users made decisions as well as suggestions for improvement. Quantitative data included the length

of time it took each person to complete each task and the number of tasks each person was able to complete. The study included six tasks, which users tried to accomplish using the prototype of the new site design. The principal investigator took notes on each subject's progress and encouraged the subjects to talk through their experience. In addition to performing the tasks, users rated the ease of use of each task on a scale of 1-5 (with 1 being difficult and 5 being easy) and the ease of use of the navigation, organization and labeling (with 1 being strongly agree that it works and 5 being strongly disagree that it works) , which resulted in quantitative data. Users also were to offer their suggestions for improvement, which were quantitative data.

The principal investigator used Ovo Studios Ovo Logger 4.1, a freeware tool, to input testing observations. The tool allowed users' performance of tasks to be timed and allowed the note-taker to keep track of each participant's comments and observations alongside the associated tasks. It also made it possible to create a report for the redesign team at the end of the testing.

Possible threats to validity in this study included having test administrators who were too close to the design (either the current or future design), who might have felt defensive about the design, or who might have tried leading users to answers. This was addressed by the fact that the principal investigator, who was not as personally invested in the intranet as the members of the design team, conducted the user testing. The principal investigator was involved in the stages of information gathering; however, she did not design the prototype and did not work for the newspaper. In addition, although she had an interest in the intranet being successful, her principal goal was to assess the

usability of the prototype, and she was mindful of listening to users rather than leading them during the usability testing.

Findings

While some positive comments came out of the usability testing, several areas for improvement were also revealed. Among the positive findings were that users liked having tools they use often, such as the archives, phone numbers and forms, on the home page. Users also generally liked the look of the prototype, which they called clean and professional looking. They also liked the organization of internal pages, including the label bars for sections. One area for improvement was the navigation: many people did not notice the navigation bar, and many did not like the bar's pop-up menus. Also with regard to navigation, users said they would have preferred more navigation on the home page. Users also were interested in seeing an area specifically for locally generated information. The labeling got mixed reviews: several people thought the labels in the navigation bar were too similar to each other; and several did not like the term "Hot Now" for the news area. Users also were eager for the Search feature, which is planned for a second phase of the intranet redesign, to work. And although they generally liked the clean look of the prototype, they requested more "pizzazz," such as color and graphics.

Results of Usability Test

Tasks:

	Mean (average) time in seconds	Median time in seconds	Average rating on scale of 1-5 (where 1 is easy and 5 is difficult)	Task Resolution
Scenario 1: Find a graphics request form.	6.9	7	1.11	Successful: 9
Scenario 2: Find a home phone number for Scott Ajax of Raleigh.	69.6	66	1.45	Successful: 7 Successful With Help: 2
Scenario 3: Find the names of the officials of Wendell, N.C.	49.7	30	2.0	Successful: 7 Successful With Help: 2
Scenario 4: Find the News & Observer newsroom ethics policy.	64.5	35	2.22	Successful: 9
Scenario 5: Find the hurricane survival kit and locate the Dare Co. evacuation routes.	141.2	124	3.33	Successful: 4 Successful With Help: 4 Unsuccessful: 1
Scenario 6: Find examples of stories from other newspapers that have been collected on the site.	65.44	56	2.45	Successful: 5 Successful With Help: 4

Ranking of Navigation, Labeling and Organization:

	Average rating on scale of 1-5 (where 1 is strongly agree and 5 is strongly disagree)
Question 7: The navigation is easy to use.	2.11
Question 8: The labeling on the site is clear.	1.89
Question 9: The site is well organized.	1.89

The first two questions were tasks – finding a form and a phone number – that could be answered by looking at the information in the center of the home page, and users found them quickly. The amount of time taken for the second task was longer because it included the time it actually took for people to find the phone number. The people who needed help with that question tried to search staff phone numbers using the input box on the home page, but the person whose phone number they were supposed to find was a Raleigh resident and not a staff member. For the third task, finding information about a town’s local officials, participants could see the link to “Local Quick Facts” in the center of the home page, but because it was under a label called “Demographics,” some users did not think officials’ names would be there.

For the fourth question, people said they would have looked under “Newsroom” for the newsroom ethics policy, but they did not notice the horizontal navigation bar at the top. Once they noticed it, they were able to find the policy document. For the fifth question – about finding the newspaper’s hurricane survival kit – users were looking for a section with locally generated information. They did not readily see such an area – and seemed unsure where it might be under the labels on the navigation bar. Many looked under “Guides/How-Tos/Help,” which was one of the main labels on the navigation bar. Research Resources was often not the first choice – and when users guessed that it might be under “By Subject,” they had a difficult time determining which subject it might be under. Even when they selected “Weather,” which is where the information was located, they usually did not see it at first because it was on the lower portion of the page. Several users had difficulties with the hover feature of the navigation bar on that question.

For the final question – find examples of stories from other newspapers that have been collected on the NeRD site – the main reason help was needed was that participants were not sure what the question meant. Many found it in the news area on the home page once they understood the question. Others, however, looked through the site for the information and had a difficult time knowing where it might be, which was under Professional Development.

With regard to questions 7, 8 and 9, where users rated the site's navigation, organization and labeling, participants were generally positive even if they had difficulty with some of the tasks. Navigation received a slightly less positive score than the other categories.

Discussion

The idea of emphasizing high-priority tasks on the home page should be maintained as the redesign moves forward. Nielsen and Tahir suggest that these tasks be given a prominent location without a lot of visual competition so that they stand out (10). Users' appreciation of the clean interface should be taken under consideration, and plans should be made for the future needs of the site so that the home page does not once again become cluttered with items for which there is no designated area. One option that could help with scalability would be to use vertical navigation rather than horizontal, which could help the site accommodate new categories that might be needed at a later date, simply because there is more space vertically on a page than horizontally – if you consider the fact that horizontal scrolling is bad for usability (Brinck 236). On the prototype, vertical space is being used by local navigation, including anchors to materials

on the page. On most pages, however, the anchors could easily be moved to across the top of the body of the page if vertical navigation were considered for global navigation.

The usability testing showed that site navigation needed to be addressed. The navigation bar, which did not stand out to users (“I didn’t realize at first that there was stuff at the top of the page”), should be made more prominent, either by using different colors or larger words or both. In addition, most users had difficulty with the pop-up menus, both because they found them awkward and because they did not want to have to hover over a label to see what was underneath. “I don’t want to have to think through what might belong where,” one user said. The recommendation is to eliminate the pop-up menus, which is in keeping with the advice of Nielsen and Tahir. “Because the primary purpose of a home page is to facilitate navigation elsewhere on the site, it is critical that users be able to find the appropriate navigation area effortlessly, differentiate between the choices, and have a good sense of what lies beneath the links” (19).

The final difficulty with navigation was that most participants wanted to see a hierarchy of the site’s contents, such as a directory, on the home page. “The home page doesn’t give me a sense of the site as a whole,” one participant said. This problem could easily be addressed by creating a directory of the site’s contents, with direct links to subsections, on the home page. When redesigning the front page in a directory structure, designers should consider using the same types of labels used on the internal pages, because participants liked the look and feel of them and thought they stood out well from other elements on the pages. “The design advantages of a broad, directory-type layout are that users can see the full scope of the site from the home page, while still having access to top-level sections of the hierarchy from the navigational bar ... the disadvantage, of

course, is that overarching portal-style layouts run the risk of being too cluttered with choices” (Head “Demystifying intranet design” 40). Having many choices on the home page is considered more acceptable on intranets, however, because users are willing to learn the site (Nielsen Designing Web Usability 275).

One way to address some of the navigation issues is to consider different categories for the navigation bar. For example, if research is the main purpose of the NeRD pages, it might be useful to have the subcategories of the “Research Resources” section – “By Subject,” “General Reference,” “Phone Numbers,” “Computer Assisted Reporting (CAR),” “Card Catalog,” and “Guides/How-Tos/Help” – be the main categories for the site instead of “Research Resources,” “Newsroom,” “Professional Development,” “Company Resources” and “Help.” If that switch were made, however, it would be helpful to also have “Newsroom Tools” as one of the main categories because newsroom employees need that information often. “Professional Development,” which is not used often because most users have indicated they do not have time, could be grouped under “Newsroom Tools.” “Company Resources” could be grouped with the departments at the top, which will be useful if other departments adopt the new intranet design as hoped. The suggested redesign would do several things. It would highlight the research areas in the navigation bar; it would allow the subcategories of those areas to be featured in the new directory structure of the home page; and it – along with the new directory structure – would eliminate the need for pop-up menus on the navigation bar. One effective result of this reorganization would be to give more prominence to the “By Subject” area, which has been greatly redesigned and which is currently difficult to find. The team should also consider using “Databases” as a main category, especially because

that is a main use of the site for research and that heading stood out as popular in the card sort.

Another issue for users was that they had trouble finding locally generated information. “I’m hoping there will be a Facts & Contacts,” one user said. The site designers had consolidated much of the locally generated information into the “By Subject” area of the new design – with area weather information on the “Weather” page, area crime statistics on the “Crime/Courts/Law” page, and more. Although users liked having the information in the “By Subject” area once they saw it, most wanted a separate area with locally generated information as well – and were inclined to search that way. After the usability testing, the redesign team suggested adding a geography facet on the front page with direct links to each of the cities and counties in the newspaper’s coverage area under the label “Local Quick Facts,” which would be a good use of the idea of facets in information architecture, giving users a different path to this information. This way, although the information could still be housed elsewhere, such as under “Demographics,” users would see it under “Local Quick Facts” and be able to find what they were seeking quickly.

There were two labeling issues – that users thought the main category names were too similar to each other, and that some did not like “Hot Now” as a label for the area that is typically called “What’s News,” and some did not like “Good J Outside the N&O” because they thought those headings were unclear. The copy editor who was tested also recommended against abbreviations such as “DBs” for “databases” because that meaning would not immediately be clear to employees. During the usability testing, many users were indecisive about which category in the navigation bar to select when performing

tasks. “Unclear scent, or multiple labels with equivalent scent for the desired content, will often require conscious deliberation ... if a user is indecisive, moving the mouse between two or three links in the navigation bar and not making a decision, it is very likely that the scent is unclear” (Withrow 8). This issue is addressed earlier with the idea of switching to Research Resources categories, although this could likely be resolved by reorganizing the main categories in a different manner. The issue of confusing names could be addressed by keeping labels simple and clear rather than trying to be clever, as is recommended by Nielsen and Tahir (59).

Users were eager for a Search feature because they thought it would help them find information. Search features are highly recommended for intranets – and for all sites – because they help users get to information quickly. The placement of the Search feature on the prototype – toward the top of the page – is recommended (Nielsen and Tahir 59); however, Search would also work well on every page so that users will have access at all times. It is also recommended that the Search feature be implemented with the first iteration of the redesign rather than later because users, both before and after the usability test, have been requesting a Search feature.

Users were interested in more graphic appeal – and some said they had trouble seeing the text because of its color (blue) and size (small). “It’s functional, but doesn’t have a lot of color or pizzazz,” one participant said. The site can be made more graphically appealing without a lot of graphics. Increasing the size and appeal of the logo, adding color for emphasis in certain places, and increasing text size and contrast (making it black on white) will go a long way toward improving the look and feel. Heavy use of graphics is discouraged on intranets because of the extra time it takes to download them.

Contrast should improve the look and flow of pages. “Contrast is critical to overall balance and structure, differentiating elements within a display, and controlling the users’ gaze. Contrast allows structure to emerge from the page” (Brinck 188).

Several user comments fell outside the scope of the test. For example, at least two people said they missed the employee photos that used to accompany phone numbers in the staff phone directory. That directory is maintained by another department, and this information will be given to them. The San Antonio Express-News in Texas employed the same technique successfully, which makes sense given that photos help staff members identify each other. (The News Research Department also plans to eventually implement another technique employed by that newspaper: clickable maps to get information about local geographic areas.) One user also commented that he liked that there was a permanent area for news – a feature that Nielsen highly recommends on intranets.

In the usability test, it might have been better to give users a minute or two to familiarize themselves with the new site before jumping in to the test. If that had been done, more people might have noticed the navigation bar. This was considered but not done because the redesign team thought it might confuse users to see so many “Under Construction” areas. Also, the gender mix could have been better. Some men were unable to make it at the last minute, so there were seven women and two men total.

Conclusion

While the redesign team found value in all the stages, they found the user interviews and usability testing the most valuable because they provided the most

detailed feedback to be used in the redesign. The content analysis also proved very useful because it helped the redesign team gain a greater understanding of the scope of the current site, what contents could be removed and archived, and what could be improved. The least valuable exercise was the card sort because, although it helped the redesign team understand how users would categorize certain labels, it did not provide an understanding of what content should be featured on the home page, which was an intended goal. In hindsight, it may have been helpful to have had a better idea of what needed to be featured on the home page – especially the idea that a directory structure – before doing the card sort. The information learned from the card sort did, however, help the team decide on navigation and what labels to use on many of the internal pages.

An interesting finding was that many of Nielsen's usability guidelines held true with this group of users. For example, they definitely wanted a directory or hierarchy on the home page, of which Nielsen is a big proponent, especially on intranets. Users also strongly disliked the pop-up menus on the navigation bar because they could not see what lay beneath without effort on their part. They also were eager for the Search feature that Nielsen recommends for intranets, and did not understand some of the cute labels, which Nielsen says to avoid.

The testing also showed that the baby did not need to be thrown out with the bath water, so to speak. The original home page, while crowded and lacking navigation, had some elements worth retaining, such as the idea of giving a sense of the site's contents on the home page. The testing suggests that that is an important element to re-introduce with the redesign. Also, users missed the local Facts & Contacts feature. Users said in the early user interviews that they did not use this feature as much as they once had because

it was not always kept up-to-date. Keeping an area for locally generated information and focusing on maintenance is suggested. At the same time, the additions of navigation, facets, a dedicated news area, templates with headers and footers, and consistent labeling are all welcome additions to the site in the redesign.

The pages in the “By Subject” area included some good design decisions that participants liked once they saw them – including pointing out books in the News Research Department on the topic and offering a catalog search option. That was useful because many people in the original testing did not realize there was a catalog – and could not find it on the home page when asked. Including locally generated information on these pages is also useful, especially if people are searching by subject. The information on the pages is also chunked into groupings well, which is an important concept in information architecture. One reason the designers grouped local information into the “By Subject” area was that some users in the initial user interviews complained that they did not know where to start looking because there were several places they could potentially find the same information. The “By Subject” area was not easily discovered by participants, however, and could be featured more prominently in the design. Another reason to highlight it is that, in the original user interviews, “Web Sites By Subject” was not visited often, so employees might need to see that it is different now and contains different information in a different format.

Several improvements could have been made in the redesign process. First, the development of a statement of purpose would have helped guide the development of the site and not have taken much time to produce. For example, it might have been along the same lines as the purpose of the intranet in the Drennan article about journalists in

England: to help journalists find information they need to produce articles. A statement of purpose would have helped with the design of the home page and also the navigation system by helping to clarify how the information should be prioritized. Instead of a research-centered site, the prototype used for the testing had as its main areas “Research Resources,” “Newsroom,” “Professional Development,” “Company Resources,” and “Help.” User testing, however, showed that this navigation scheme made it difficult to get to the Research Resources – and the nicely redesigned and content-rich By Subject area – which could be considered the primary purpose of the News Research Department’s intranet. Designers may want to reconsider their main navigation categories.

The information from the card sorts did prove useful in naming labels; however, it is possible it could have been more effective if the team had conducted several card sorts on different topics, such as “Crime/Courts/Law” and “Weather” to see how users grouped those contents. Card sorts likely would have been more beneficial with individual sections with content that needed to be grouped, rather than with the large amounts of varied information. In addition, in the future it would be helpful to have a closed card sort, in which category labels are pre-assigned, following the open card sort to gain a more cohesive sense of the understanding of the labels.

In future iterations of the redesign, it is suggested that the redesign team make several simple pencil sketches of possible organization schemes, share them with co-workers, and be willing to throw away those that do not work. More usability testing is highly recommended to test the effects of the redesign following the recommendations in this paper. If the same methodology is used, the team will be able to compare the times

taken to complete each task and the number of successful completions to make sure the site's usability is improving with each iteration of the redesign.

The redesign team is still working on the issue of whether the scope of the intranet will be expanded to include all departments in the new design. They did include the other departments as links at the top of the NeRD site, where they link to the departments' intranet pages. Other departments could then use the same template as the NeRD pages for their own pages, thus creating a more cohesive company-wide intranet, although there has not yet been buy-in for this idea from other departments. A cohesive company-wide intranet would eliminate some confusion about where information such as "Company Resources" belongs. If the site were truly company-wide, most of this information could likely fit into a "Human Resources" category. The staff also is working on the issue of intranet maintenance because up-to-date information is critical to user satisfaction.

Developing the information architecture upon which to build a website is a process that takes careful thought and consideration. Obtaining input from users and analyzing content gives designers a solid basis for good decision-making. Using that information, considering many navigation and facet options, and testing the redesign for usability, goes a long way toward meeting users' needs in an intranet. All of this is especially important in designing a site for journalists, who are often under tight deadlines and need to gain access to information quickly.

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Appendix A: Confidentiality Agreements

News & Observer Intranet Testing Confidentiality Agreement

February 2005

Thank you for agreeing to participate in this usability test for the purpose of improving the quality of the newsroom's intranet. Several newsroom employees have given input in different ways prior to the redesign, and now we are testing a prototype of the proposed redesign to see how well people who will actually use the site are able to navigate it. The results from this study will be used to improve the site so that it will be more usable to newsroom employees. Information from this usability test will also be used in a master's paper being written by me, Cindy McCracken, a graduate student at UNC-Chapel Hill, which is a study of the techniques used in the redesign. The study has been approved by the UNC-Chapel Hill Behavioral Institutional Review Board. If you have questions or concerns about your rights as a participant, please contact the IRB at 919-962-7761 or at aa-irb@unc.edu. My faculty adviser is Dr. Deborah Barreau, an associate professor at UNC's School of Information and Library Science, and she can be reached at 919-966-5042 or at barreau@ils.unc.edu.

Your name will not be used in the master's paper, and the information that you share with us will remain confidential. The only people who will know how you specifically answered certain questions will be Susan Ebbs and me; the rest of the intranet redesign team, all of whom work in the News Research Department, will receive summary data of the results of all the tests. Neither Susan nor I will discuss your individual answers with anyone. The information from the tests will be used for the purpose of improving the website. There are no risks involved with participating in this study. The purpose of gathering the information is to learn how to improve the website, and not to judge your performance in any way. We are simply trying to see what works with the site design and what needs improvement.

When I am not using the original data from this study, including the questionnaires, notes and videotapes, I will keep them in a file that will be locked in my house. At the end of the study, I will destroy the paper questionnaires, videotapes, and notes. I will, however, have keyed the data into my personal laptop computer and password-protected them.

This test should take about half an hour to forty-five minutes. You will be given a questionnaire with tasks and questions. Please work through each task using the prototype of the redesign, talking through it aloud as you do. The Search feature is not yet available – so you will need to use the navigation. I will be timing the amount of time it takes you to complete each task and taking notes about the paths you decide to take to complete the tasks, as well as recording your comments. Susan will take notes as well, and those notes also will be kept in the file at my house. At the same time, I'll be videotaping the screen – and your voice – so that I have a record of the ways you try to complete tasks to refer to when writing the paper. After completing each task, or stopping, please rate the task on a scale of 1-5, with one being easy and 5 being difficult, by circling your choice, and write down any comments you have about the task in the space below the question. Once you have completed the tasks, please answer the questions at the end of the questionnaire.

Knowing all this, do I have your verbal consent to participate in the study?

Thank you for your help with the redesign effort.

Testing Observer Confidentiality Agreement Form

I understand that the usability testing of the News & Observer's intranet is confidential in nature, and I agree not to reveal any individual responses to any questions on the test – or any other comments participants make during testing – to individuals outside the testing room.

Testing Observer Printed Name

Testing Observer Signature

Appendix B: Usability Test

News & Observer Intranet Usability Testing: February 2005

Part 1: Tasks: Please perform each task, **circle** what you considered to be the level of ease or difficulty of the task, and make any comments you have.

1. Find a graphics request form.

1	2	3	4	5
Easy	Somewhat Easy	Neither Easy Nor Difficult	Somewhat Difficult	Difficult

Comments:

2. Find a home phone number for Scott Ajax, who lives in Raleigh, NC.

1	2	3	4	5
Easy	Somewhat Easy	Neither Easy Nor Difficult	Somewhat Difficult	Difficult

Comments:

3. Find the names of the officials of Wendell, N.C.

1	2	3	4	5
Easy	Somewhat Easy	Neither Easy Nor Difficult	Somewhat Difficult	Difficult

Comments:

4. Find the N&O newsroom's ethics policy.

1	2	3	4	5
Easy	Somewhat Easy	Neither Easy Nor Difficult	Somewhat Difficult	Difficult

Comments:

5. **There is a version of the hurricane survival kit on the NRD site. Find it, and locate the Dare County evacuation routes.**

1	2	3	4	5
Easy	Somewhat Easy	Neither Easy Nor Difficult	Somewhat Difficult	Difficult

Comments:

6. **Find examples of stories from other newspapers that have been collected on the NeRD site.**

1	2	3	4	5
Easy	Somewhat Easy	Neither Easy Nor Difficult	Somewhat Difficult	Difficult

Comments:

Part 2: Ratings of site features: Please rate the following statements on a scale of 1-5 where 1 is Strongly Agree and 5 is Strongly Disagree.

7. The navigation is easy to use.

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Comments:

8. The labeling on the site is clear.

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Comments:

7. The site is well organized.

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Part 3: Feedback: Please answer the following questions to help us make improvements to the NRD site design before it is implemented. **You may do this aloud.**

10. What do you like about the redesign? Why?

11. What do you dislike about the redesign? Why?

12. What suggestions do you have for improvement?

13. Please give us any other comments you may have about the site.

Thank you for your time!

Appendix C: Screen Shots of Existing Intranet

Home Page - Top

The screenshot shows the Microsoft Internet Explorer browser displaying the home page of the News & Observer News Research Department (NeRD). The browser's address bar shows the URL <http://nerd/>. The page layout includes a navigation menu on the left side with links such as "What's New Number Watch", "Ask NRD", "Staff Phones", "Directory update", "ReferenceUSA", "Forms", "Conference Rooms", "Email auto response", "Calendars", "Current time", "Staff Development", "N&O Employees", "Cheatsheets", "newsobserver.com", "triangle.com", "the insider", "N&Otes", "About The N&O", "N&O Academy", "N&O Intranet", and "McClatchyMat".

The main content area features the department's name "The News & Observer News Research Department" and the "NeRD" logo. Below this, there is a section titled "N&O Archives" with a list of links: "Mediasphere" (Photos, graphics, text, and full pages), "Newsbank" (Traditional field and Boolean searching), "N&O Factiva" (Direct link to The N&O), and "Guide to The N&O Archives" (NCLive -- more databases, Get Wake Co. password or contact your library). A pink box on the right contains the text "Your right to know Sign up to join the FOI Interactive discussion on open access to information. All employees welcome!" and "Wednesday March 16 Noon in the Disco".

At the bottom of the page, there are two sections: "Web sites by subject" and "People Finding", each with a dropdown menu labeled "Choose one". Below these are links for "General Reference" and "CAR & PublicRecords". A footer note states "Contains commands for working with the selected items."

Home Page – Bottom

The screenshot shows the bottom portion of a web browser window displaying the NERD Home Page. The browser is Microsoft Internet Explorer, with the address bar showing 'http://nerd/'. The page layout includes a left sidebar with various links, a main content area with several dropdown menus, and a bottom navigation table.

Left Sidebar Links:

- Staff Development
- N&O Employees
- Cheatsheets
- newsobserver.com
- triangle.com
- the insider
- N&Otes
- About The N&O
- N&O Academy
- N&O Intranet
- McClatchyNet
- Readers' Corner
- Google
- Google News
- Other Search Engines

Main Content Area:

- Fact Checking Checklist**
- NRD Catalog** -- Catalog of books, magazines, maps, databases and other resources in NRD.
- Factiva** -- Online access to 8,000 newspapers, magazines, and trade journals. (NOTE: Requires Internet Explorer)
- Reading Room** -- Selection of news stories and projects from around the country.
- Web sites by subject**: Choose one
- People Finding**: Choose one
- General Reference**: Choose One
- Newsroom**: Choose One
- CAR & PublicRecords**: Choose One
- Journalism & Other Media**: Choose One

Bottom Navigation Table:

Circulation	Human Resources	Information Services	Newsroom	News Research	Online News
Do Not Call log Search DNC list DNC Policy Rack Card Sked In-Store Promo	N&O Academy NEO Nomination form Training Calendar	Computer Support Computer Training Helpdesk Sked Conversion Services	Water Cooler Copydesk Sked Photo Guidelines N&O Stylebook AP Stylebook	Projects Reprint Public Research Freelance entry Freelance search	Breaking News Edit Obits

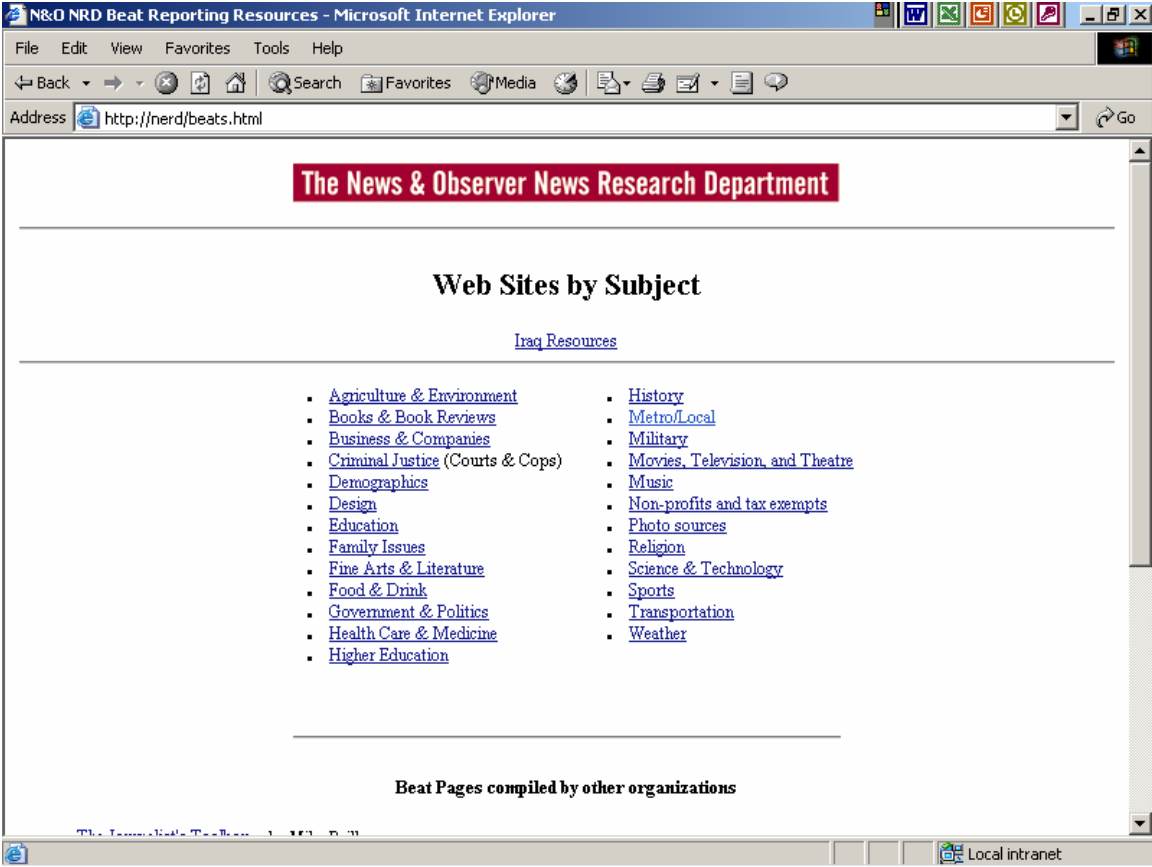
WEEKEND ON CALL # FOR BREAKING NEWS: 812-8473

Local intranet

Facts & Contacts Page



Web Sites by Subjects - Main Page



Weather Page

N&O NRD Weather Resources - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Home

The News & Observer News Research Department

Weather Resources



[Disaster Links](#)

Hurricanes

[N&O - NeRD Hurricane Resource Guide](#) -- local and national information; maps.
[National Hurricane Center](#) -- Tropical Storm Prediction Center.
[Historical Hurricane Tracks](#) -- from NOAA Coastal Services Center.
[Extreme Weather Links](#)

Local Weather Data

[National Weather Service Raleigh office](#) - Great starting point for local weather stories.
[National Weather Service Wilmington office](#)
[WRAL's weather page](#) -- includes local **historical** data.
[NCDC Weather Station: RDU](#) -- Historical weather data for RDU weather station.
[Southeast Regional Climate Center](#)
[NC State Climate Office](#)

Done Local intranet

Weather – Bottom

N&O NRD Weather Resources - Microsoft Internet Explorer

File Edit View Favorites Tools Help


Back Forward Stop Home Search Favorites Media

[National Weather Service Wilmington office](#)
[WRAL's weather page](#) -- includes local **historical** data.
[NCDC Weather Station: RDU](#) -- Historical weather data for RDU weather station.
[Southeast Regional Climate Center](#)
[NC State Climate Office](#)

General Weather
[National Weather Service](#)
[AccuWeather](#)
[The Weather Channel](#) - Lots of graphics and basic educational stuff.
[Climate Information for anywhere in the U.S.](#)
[Historic weather](#)
[USA Today's weather page](#)
[NWS - Interactive Weather Information Network](#)
[WeatherNet](#)-- Links to almost 400 weather sites.
[Weather Information Superhighway](#)
[CNN's weather page](#)

Need Help? Send a request for research to the [News Researchers](#).

If you have any suggestions, additions, or corrections for this page, please email [News Research](#).



Web Sites by Subject – Criminal Justice (top)

N&O NRD Criminal Justice Resources - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail News

Address <http://nerd/crime.html> Go

The News & Observer News Research Department

Criminal Justice Resources

<i>Crime & Police</i>	<i>Courts & Justice</i>
North Carolina Department of Correction	Death Penalty Information Center
North Carolina Office of the Chief Medical Examiner	North Carolina Court System
Police Agencies on the Web	U.S. Court of Appeals, Fourth Circuit Cases
Police Officer's Internet Directory	Supreme Court Transcripts and Decisions
NC Offender information ... search by prisoner name	NC Office of Executive Clemency ... Applications for pardon or commutation.
AOC Criminal Searches via Carolina Information	FindLaw - Supreme Court cases and US code
<i>Law & Lawyers</i>	<i>Statistics & General sites</i>
FindLaw: Internet Legal Resources	Bureau of Justice Statistics
Martindale-Hubbell Lawyer Locator	Cecil Greek's Criminal Justice Page
FBI - for the Uniform Crime Report and other info.	
North Carolina Bar Association	Crime in North Carolina - SBI crime statistics

Done Local intranet

Web Sites by Subject – Criminal Justice (bottom)

The screenshot shows a Microsoft Internet Explorer browser window titled "N&O NRD Criminal Justice Resources - Microsoft Internet Explorer". The address bar displays "http://nerd/crime.html". The main content area features a two-column list of links:

FindLaw: Internet Legal Resources	Bureau of Justice Statistics
Martindale-Hubbell Lawyer Locator	Cecil Greek's Criminal Justice Page
FBI - for the Uniform Crime Report and other info.	
North Carolina Bar Association	Crime in North Carolina - SBI crime statistics
United States Law -- searchable	NC Prison reports
North Carolina Law -- searchable General Statutes	National Criminal Justice Reference Service (NCJRS)
NC Lawyers Weekly -- Login in as leo9862, password is nando.	

Below the list, there are three paragraphs of text:

For state and local contacts and statistics, please go to the [Facts & Contacts](#) page.

To find an "expert," try [ProfNet](#).

Need Help? Send a request for research to the [News Researchers](#).

This page will be updated regularly so check often for new interesting links. If you have any suggestions, additions, or corrections for this page, please email [News Research](#).

At the bottom of the page, there is a row of five small cartoon dog icons.

The browser's status bar at the bottom shows "Done" and "Local intranet".

Newsroom Page (Top)

N&O Newsroom - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail News

Address <http://nerd/newsroom/> Go

The News & Observer News Research Department

Newsroom

[Annual and Mid-year Review](#) | [Job Openings](#) | [Newsroom Calendar](#) | [Freelance Contract \(full rights\)](#) | [\(full rights/no pay\) \(N&O only\)](#) | [One-time submission](#) | [Reprint](#)

- [2005 Goals](#)
- Accuracy and Credibility
 - Resources from the [2000 Managers' Retreat](#)
 - [N&O Pocket Guide to Terror Style](#)

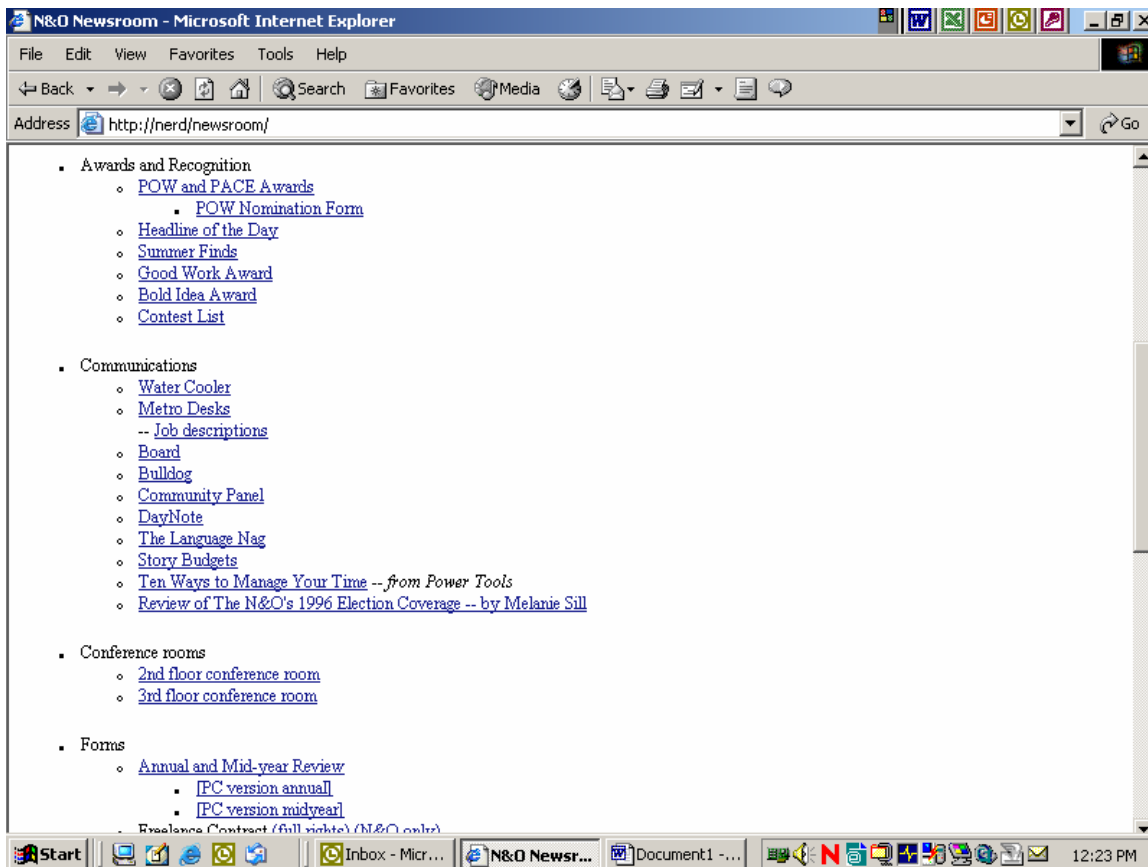
N&O Stylebook	All entries	A	B	C-E	F-H	I-L	M-N	O-P	Q-R	S-Z	Stylebook Highlights	Add Stylebook to Apple man
-----------------------------------	-----------------------------	-------------------	-------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	--------------------------------------	--

- [AP Stylebook \(searchable\)](#)
 - [AP Stylebook PDF \(also searchable\)](#)
- [NLGJA Stylebook Supplement](#)
- [Jayson Blair discussion](#)

- Awards and Recognition
 - [POW and PACE Awards](#)
 - [POW Nomination Form](#)
 - [Headline of the Day](#)
 - [Summer Finds](#)
 - [Good Work Award](#)

Done Local intranet

Newsroom Page (middle)



Newsroom Page (bottom)

N&O Newsroom - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://nerd/newsroom/> Go

- [2002 Goals and Initiatives](#)
- [Ethics policy](#)
- [Leave policy](#)
- [Development policy](#)
- [Dress code guidelines](#)
- [Dateline policy \(June 2003\)](#)
- [Writing a Tar Heel \(September 2004\)](#)
- [Youth policy](#)

- Diversity issues
 - [Diversity Committee Critique, July 1998](#)
 - [Diversity Committee Critique, May 1998](#)
 - [Diversity: VI The National Forum on People's Differences](#)
- Projects and committees
 - [Readership Institute - Solutions to Grow Readership](#)
 - [Blanket the Triangle Survey Results](#)
 - [Young Readers Project](#)
- Surveys
 - [Secret Reader Survey \(Managers Retreat 2004\)](#)
 - [Q Survey](#)
 - [Arts & Entertainment survey 2000](#)
 - [Sports survey 1999](#)

Need Help? Send a request for research to the [News Researchers](#).

Start | Inbox - Micr... | N&O Newsr... | Document1 - Microsoft Word | 12:23 PM

Appendix D: Screen Shots of Prototype of Redesign

Home Page - Top

The screenshot shows the top portion of the NeRD Page website. The browser window title is "The NeRD Page - Home - Microsoft Internet Explorer". The page has a navigation bar with the following links: [Home](#), [Research Resources](#), [Newsroom](#), [Professional Development](#), [Company Resources](#), and [Help](#). Below this is a secondary navigation bar with links: [By Subject](#), [General Reference](#), [Phone Numbers](#), [CAR](#), [Card Catalog](#), and [Guides/How-Tos/Help](#).

The main content area is divided into three columns:

- Search:** Includes radio buttons for "The Internet with Google" and "The NeRD Pages". Below is a search input field and a "Go" button. A link for **Factiva** is provided, stating "Online access to 8,000+ newspapers, magazines and trade journals." Under **N&O Archives**, there are links for **Mediasphere** and **Newsbank**.
- Frequently Asked Research:** Contains a **Phone Numbers** section with a "Search Staff Phones" sub-section featuring an input field for "enter staff name" and a "Search" button. Links include "Staff Phones - Advanced Search", "National phone lookup (Reference USA)", "Switchboard", and "More ...". A **Demographics** section includes links for "Local city/county Quick Facts", "Census", "N.C. State Data Center (LINC)", and "More ...".
- Hot Now!:** A sidebar section with a red header. It features:
 - One-hour Sabbatical:** "Join David Cecelski, of the Southern Oral History Project at UNC, for a discussion of storytelling out loud." (Wed., Jan. 5, 12:30, Disco)
 - Youth Readership Survey:** "Find the full survey on the [Newsroom](#) page."
 - Reading Room:** "Check out the award-winning New York Times story about tacky workplace Christmas decorations and how they affect your concentration. ... In the [Reading Room](#)."

The status bar at the bottom shows "Done, but with errors on page." and "Internet".

Home Page – Bottom

The screenshot shows the bottom portion of the NeRD Page Home page. The browser window is titled "The NeRD Page - Home - Microsoft Internet Explorer". The address bar is empty. The page content is organized into several columns and sections:

- Search Staff Names:** A search box with the placeholder text "enter staff name" and a "Search" button.
- Staff Links:**
 - Staff Phones - Advanced Search
 - National phone lookup (Reference USA)
 - Switchboard
 - More ...
- Demographics:**
 - Local city/county Quick Facts
 - Census
 - N.C. State Data Center (LINC)
 - More ...
- Forms:**
 - Photo Request Form
 - Graphics Request Form
 - Conference Room Reservation
 - More Newsroom Forms ...
 - More Company-Wide Forms ...
- Factiva:** Online access to 8,000+ newspapers, magazines and trade journals.
- N&O Archives:**
 - Mediasphere
 - Newsbank
- Southern Oral History Project at UNC:** for a discussion of storytelling out loud. (Wed., Jan. 5, 12:30, Disco)
- Youth Readership Survey:** Find the full survey on the Newsroom page.
- Reading Room:** Check out the award-winning New York Times story about tacky workplace Christmas decorations and how they affect your concentration. ... In the Reading Room.

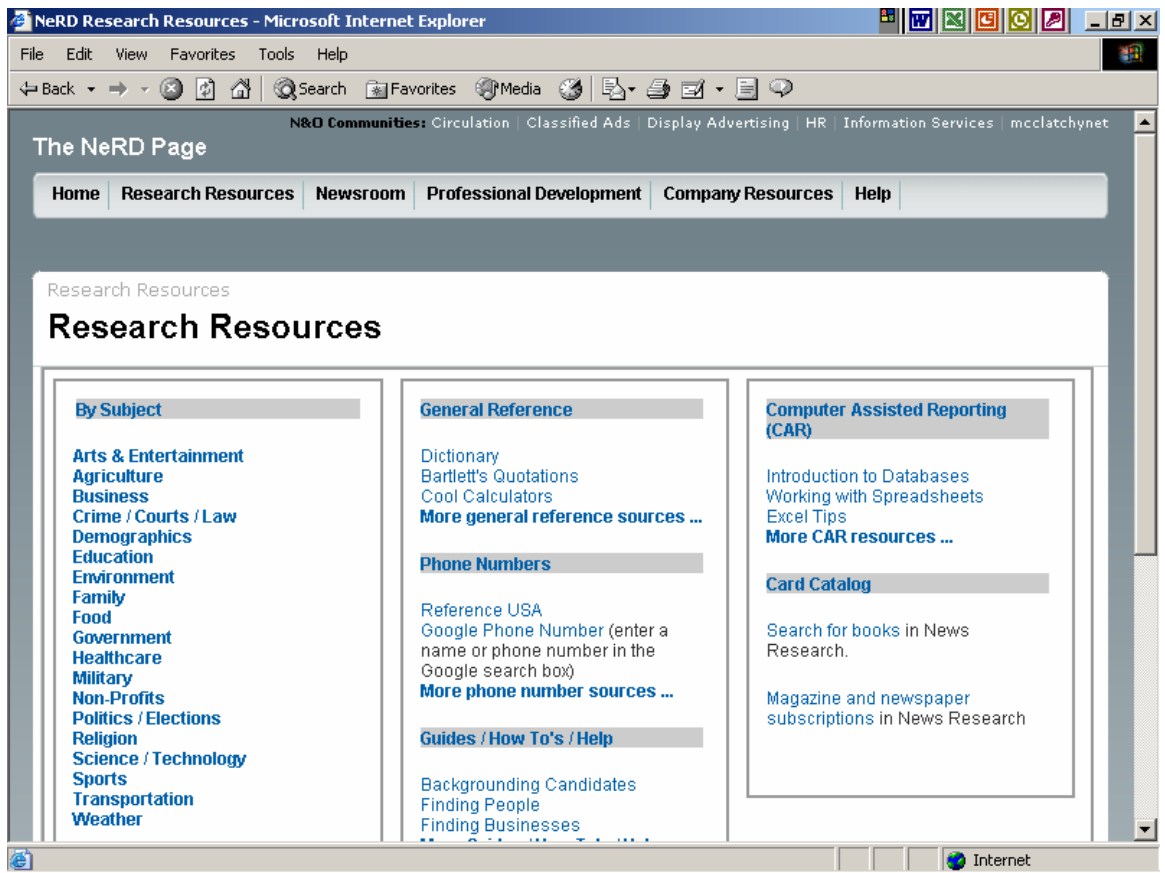
At the bottom of the page, there is a footer with the following text:

newsobserver.com | mcclatchy.com | triangle.com

Contact News Research // By email: research@nando.com // By phone: 829-4580 // Weekend On Call: 812-8473

The browser status bar at the bottom shows "Done, but with errors on page." and "Internet".

Research Resources



Weather Page – Top

NeRD Weather Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail

N&O Communities: Circulation | Classified Ads | Display Advertising | HR | Information Services | mcclatchynet

The NeRD Page

Home Research Resources Newsroom Professional Development Company Resources Help

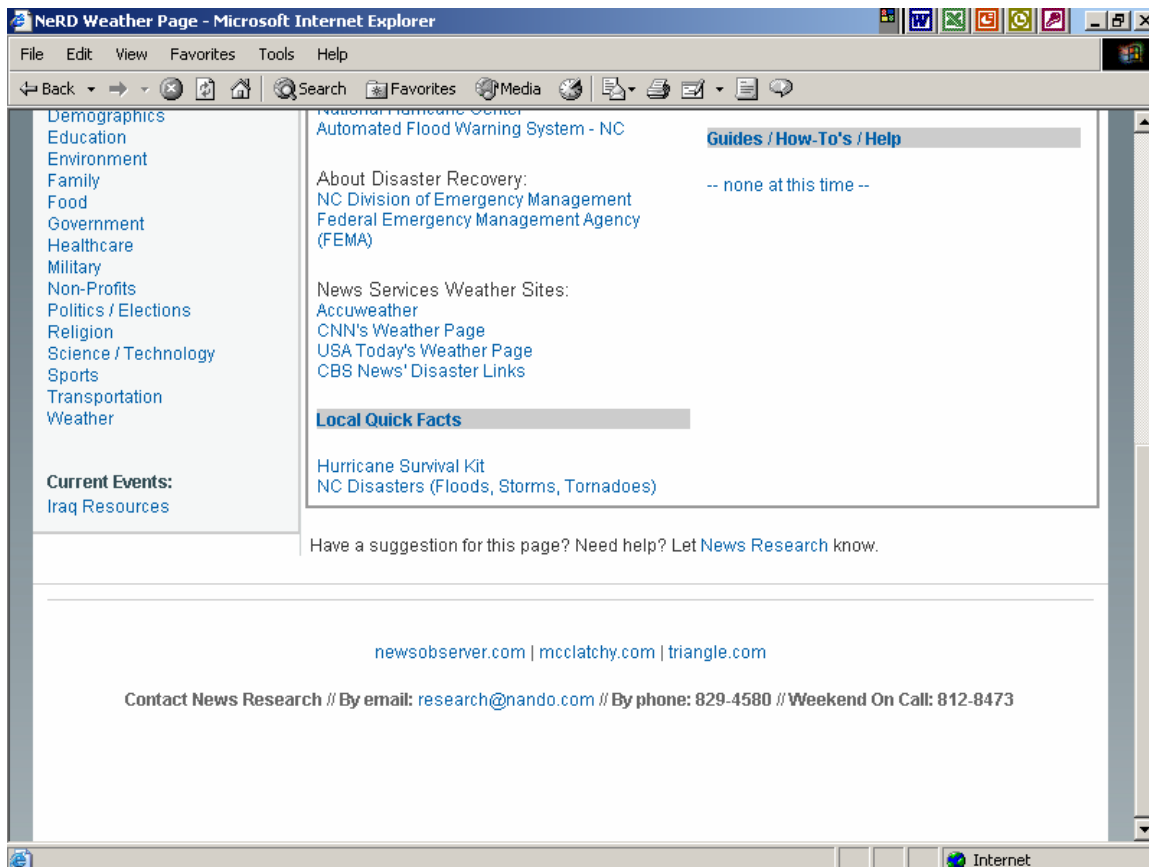
Research Resources >> By Subject >> Weather

Weather

<p>On This Page:</p> <ul style="list-style-type: none"> Web Sites Statistics and Searchable DBs Books in News Research Local Quick Facts Guides/How To's/Help <p>Visit Other Subject Areas:</p> <ul style="list-style-type: none"> Arts & Entertainment Agriculture Business Crime / Courts / Law Demographics Education Environment Family Food Government 	<p>Web Sites</p> <p>About Weather and Climate:</p> <ul style="list-style-type: none"> State Climate Center of NC Southeast Regional Climate Center National Oceanic and Atmospheric Administration (NOAA) National Weather Service Interactive Weather Information Network National Climate Data Center: Extreme Weather Naval Observatory <p>About Storms:</p> <ul style="list-style-type: none"> NC Stormtrack National Hurricane Center Automated Flood Warning System - NC <p>About Disaster Recovery:</p> <ul style="list-style-type: none"> NC Division of Emergency Management Federal Emergency Management Agency (FEMA) 	<p>Statistics and Searchable DBs</p> <ul style="list-style-type: none"> RDU Temperature Records NC's 10 Worst Hurricanes (from UNC TV) <p>Books in News Research</p> <ul style="list-style-type: none"> Complete Weather Resource [QC981.E66 1997] Deadliest, Costliest & Most Intense U.S. Hurricanes of this Century [QC944.H4 1993] NC's Hurricane History [QC945.B37 2001] <p>Search the catalog for more books ...</p> <p>Guides / How-To's / Help</p> <p>-- none at this time --</p>
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Internet

Weather Page – Bottom



Crime/Courts/Law Page – Top

NeRD Crime/Courts Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail

N&O Communities: Circulation | Classified Ads | Display Advertising | HR | Information Services | mcclatchynet

The NeRD Page

[Home](#) [Research Resources](#) [Newsroom](#) [Professional Development](#) [Company Resources](#) [Help](#)

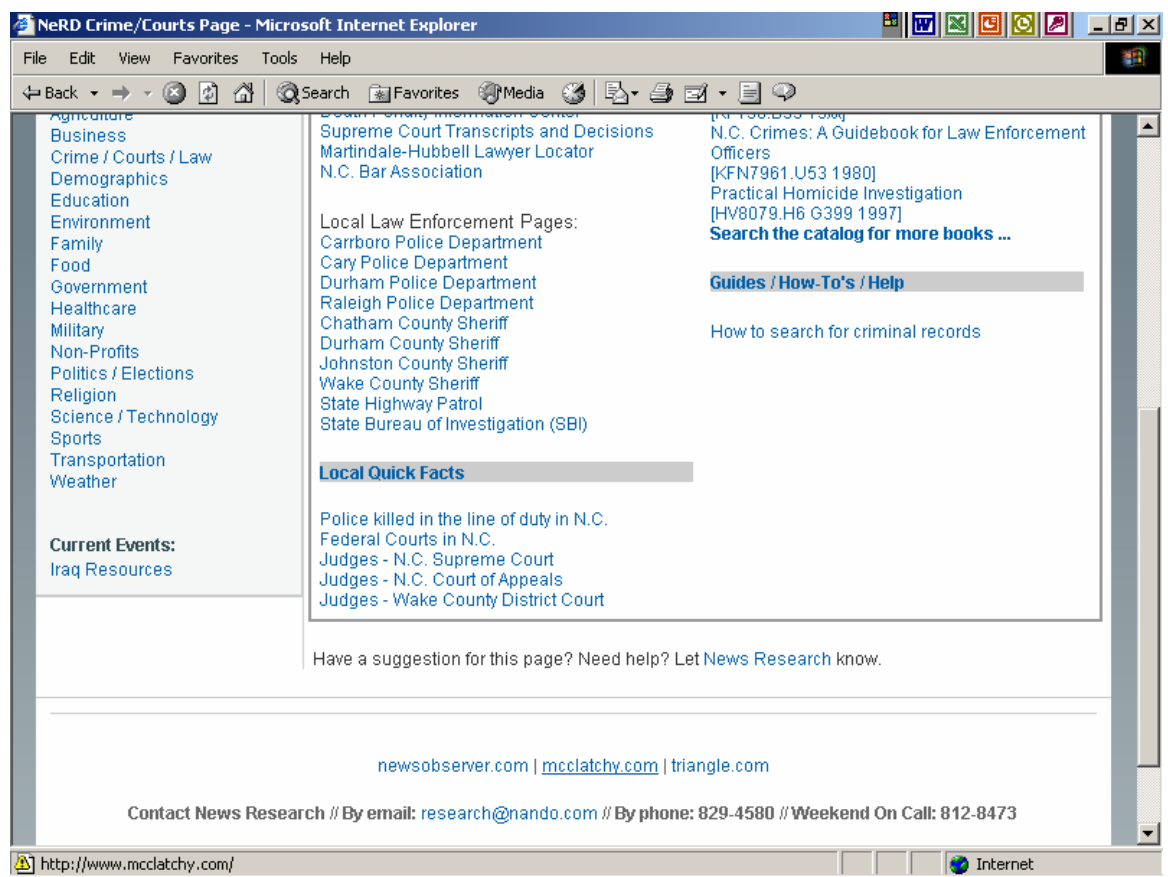
Research Resources >> By Subject >> Crime/Courts/Law

Crime / Courts / Law

<p>On This Page:</p> <ul style="list-style-type: none"> Web Sites Statistics and Searchable DBs Books in News Research Local Quick Facts Guides/How To's/Help 	<p>Web Sites</p> <p>About Crime: N.C. Dept. of Corrections State Bureau of Investigation Federal Bureau of Investigation U.S. Drug Enforcement Agency Police Officer's Internet Directory N.C. Law Enforcement Agencies</p> <p>About Courts / Law: N.C. Administrative Office of the Courts Death Penalty Information Center Supreme Court Transcripts and Decisions Martindale-Hubbell Lawyer Locator N.C. Bar Association</p> <p>Local Law Enforcement Pages: Carrboro Police Department Cary Police Department Durham Police Department Raleigh Police Department</p>	<p>Statistics and Searchable DBs</p> <ul style="list-style-type: none"> Bureau of Justice Statistics N.C. General Statutes N.C. Crime Statistics FBI Uniform Crime Report Search AOC for NC Criminal Records N.C. Offender's Search <p>Books in News Research</p> <ul style="list-style-type: none"> Black's Law Dictionary [KF156.B53 19xx] N.C. Crimes: A Guidebook for Law Enforcement Officers [KFN7961.U53 1980] Practical Homicide Investigation [HV8079.H6 G399 1997] <p>Search the catalog for more books ...</p> <p>Guides / How-To's / Help</p>
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Done Internet

New Crime Page – Bottom



Newsroom Page – Top

NeRD's Newsroom Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste

N&O Communities: Circulation | Classified Ads | Display Advertising | HR | Information Services | mcclatchynet

The NeRD Page

[Home](#) [Research Resources](#) [Newsroom](#) [Professional Development](#) [Company Resources](#) [Help](#)

Newsroom

Newsroom

On This Page:

- [Editing / Writing](#)
- [Visual Journalism](#)
- [Forms](#)
- [Communications](#)
- [Policies](#)
- [Awards and Contests](#)
- [Projects and Committees](#)
- [Facts About the N&O](#)

Editing / Writing

- Style Guides:
 - [N&O Stylebook](#)
 - [AP Stylebook \(searchable\)](#)
 - [AP Stylebook \(PDF - searchable\)](#)
 - [N&O Guide to Terror Style](#)
 - [NLGJA Stylebook Supplement](#)
- Writing Guides:
 - [Writing a Tar Heel \(9/04\)](#)
 - [Fact Checking Tips and Pitfalls \(5/03\)](#)
 - [Fact Checking on the Copy Desk \(by Chuck Small\)](#)
 - [Error-Free Reporting \(5/00, by Foon Rhee\)](#)
 - [Error-Free Journalism \(5/00, by Pat Stith with slideshow\)](#)
- Other Newsroom Information:
 - [2005 Goals](#)
 - [Copydesk Schedule](#)
 - [Stringers](#)

Visual Journalism

- Photo Sources
 - [Photo Guidelines](#)
 - [Using PhotoGrid](#)
 - [Getting Started with the AP Server](#)
 - [Photo Stringers](#)
- Forms
 - [Photo Request Form](#)
 - [Graphics Request Form](#)
- Performance Reviews:
 - [Mac: Annual and Mid-year](#)
 - [PC: Annual](#)
 - [PC: Midyear](#)
- Freelance Contracts:
 - [Full Rights](#)
 - [Full Rights, No Pay](#)
 - [N&O Only Contract](#)

Error on page. Internet

Newsroom Page – Bottom

