

Intranet Data Access: A First Exploration

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Abstract

In many organizations, data are found in disparate systems such as spreadsheets, wordprocessor, and statistical packages. Also, the audience to which data must be reported is often vastly different from the audience that does raw data manipulation. Web browsers such as Mosaic, Netscape, and Internet Explorer offer application developers a standard interface to the disparate data across all audiences. This paper describes the efforts of an Intranet novice to construct a company website. The data accessible from the website reside in PC (mostly Lotus 1-2-3 and Paradox) and AIX (SAS® and Informix) formats.

Keywords: intranet, metadata, user interfaces, odbc

Introduction

ElectriCities of North Carolina, Inc. is a nonprofit organization that provides administrative, legal, legislative, and technical services to more than 75 municipally owned electric distribution systems in North Carolina, South Carolina, and Virginia. Although small (less than 100 employees), the diversities of skills exhibited by company personnel include accountants, engineers, communications, human resources, finance, computer science, and management specialists.

The wide array of company information resources reflects the diversity of staff. Communication and human resource personnel rely heavily on WordPerfect and PageMaker to produce manuals and newsletters. Other desktop resources employed by company personnel include Paradox databases and Lotus spreadsheets. More intense computing operations are on an IBM RS/6000 running under AIX. Financial information is maintained

there in an Informix database and engineering operational data are stored as SAS datasets.

Since ElectriCities is primarily a service organization, the employees are in constant contact with the member cities. A vehicle for ElectriCities staff to extract and summarize the diverse information sources and pass it to the member cities has been needed for quite some time. The efforts to build this long-awaited tool is now centering on the creation of a company intranet site.

User Acceptance

Before undertaking the creation of an intranet, the MIS department wanted to be ensured that ElectriCities staff would embrace such a vehicle. A prototype site was created on a minimal budget; a public domain web server was installed on an old Windows 95 machine, some static HTML pages were created using shareware editors, and some dynamic data were shown using CGI (common gateway interface) programs written with an old Microsoft Professional Basic compiler. The major MIS commitment was the time spent by two staff members.

The prototype was shown to company senior management and staff at a series of informal demonstrations. Sample web pages highlighted the different ways information of various types could be delivered to and formatted by the web browsers. Staff was impressed by ability of the web server to deliver the information quickly and by the ease-of-use of the browser. For MIS staff, this latter point was a rare win-win situation. Not only did staff find browsers easily used, the browsers eliminated much of the cross-platform and user interface issues that inhibit application development.

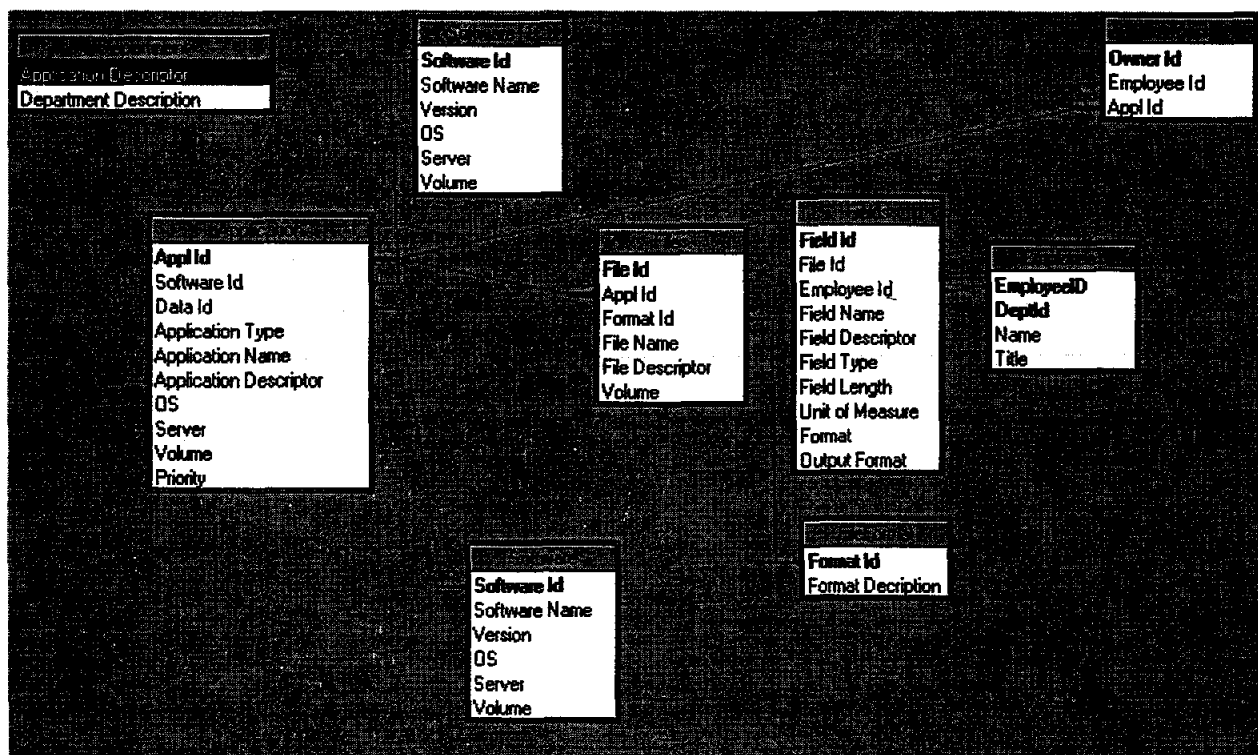


Figure 1. Relational structure of metadata for company intranet.

With support by the staff as a whole, senior management directed the MIS department to begin building a production-strength intranet site to be operational by the end of calendar year 1997. Success of that site is hoped to spawn the creation of an extranet site accessible by the member cities.

Infrastructure

Performance is a key issue in the success of the intranet site. Many of the desktop machines in the company are older 486-based PCs with limited computing ability. Cost to simultaneously upgrade these desktop machines is beyond current budget. Emphasis instead was placed on upgrading the building wiring and purchase of a Windows NT webserver. Security, particularly for the anticipated extranet, will center around the recently acquired firewall.

A second key infrastructure component was the creation of an Intranet steering committee. The participants represent a cross-section of staff. MIS wanted only to be the implementers of the

intranet; the driving force selecting web applications had to be the user community. Aside from fostering user enthusiasm, the committee was also a vehicle for feedback, user education, and usage policy.

As the infrastructure was being establish, key MIS staff attended seminars and short courses and researched the literature to acquire the new skills associated with being web authors. Topics included basic HTML, web page design, ODBC and SQL data access, gif animation, image mapping, scripting languages and textual search engines.

Metadata

The first task addressed by the intranet steering committee was polling the user community to ascertain the location and content of information sources most beneficial to the service component of the company. Prioritization of the sources lead to a game plan on how the Intranet would evolve. The gathered information was stored in a Microsoft Access database (relational structure shown in Fig. 1).

This metadata is essential to management of a production intranet. As new information sources are located or created, the web authors merely update the database, thus eliminating scalability issues. Computer database technology is very mature and reliable and the tools to maintain a database are robust and versatile. Thus, the company intranet is based on a strong component of computer technology.

Authoring Tools

As webs have evolved, so have the tools to create and maintain the webs themselves. At first, simple editors like EMACS and vi were employed and placed the burden of HTML tag usage directly on the backs of the web authors. Soon thereafter intelligent HTML editors and HTML extensions to traditional wordprocessors came onto the market to lessen the burden. However, these tools are useful for static HTML pages only and still rely on authors to supply information about links and directories.

Third generation web tools have now appeared on the marketplace. These tools, like HahtSite which the author of this paper employs, aid web authors in total site management. Furthermore, dynamic data publishing is accomplished with drag-and-drop widgets and form controls. There is no need to write a series of CGI programs; the middleware supplies the data via ODBC (open database connectivity). A big added bonus is that the middleware adds state information to the user connection so that the concept of a session can control the web publishing.

Implementation

With the intranet infrastructure in place, the data sources identified, and the site management software in house, deployment of the intranet was begun. The critical areas to consider now are home page design, navigation of information, and web page consistency.

The home page largely determines the success of an intranet site. A visually appealing and yet

intuitively simple page was the goal. Considerable time was spent writing and testing various pages. According to experts, most good home pages are the result of many man-days of labor. The end result was a page using a popular vertical frame split; a narrow frame on the left for navigation and a larger information frame on the right (see Figure 2).

The primary goal of the navigation scheme was to allow the user to find embedded web information quickly and easily. Users should only have to traverse a minimal number of web pages to find any particular item of information. However, the web author must also avoid excessive clutter on the home page. Any attempt to provide direct links to all the available information will overload the screen and confuse the user ("can't see the forest for the trees!"). Examination of the application table in the metadata provided the solution to this problem. The applications can be categorized by either the application descriptor or application type. The category lists are generated dynamically on the web pages using SQL calls (implicit in the ODBC connections) to the metadata. The user in turn selects a category and a dynamic list of applications names are then generated and returned to the user. Selection of an application name retrieves the desired information.

Header/footer objects, text fonts, background colors, and page arrangement were used to aid the user to recognize where he/she is in the overall web layout. Consistency among pages was a paramount concern as was performance. In-line graphics were kept to a minimum.

ODBC

It must be noted that the SAS datasets involved in the overall database schema are treated identically to other information sources. ODBC is truly an open standard; drivers to access Base SAS datasets come standard with the other SAS distribution media. At this time, no benchmarks have been run to compare SAS data set access via ODBC versus SAS/Intrnet®. It is hoped that

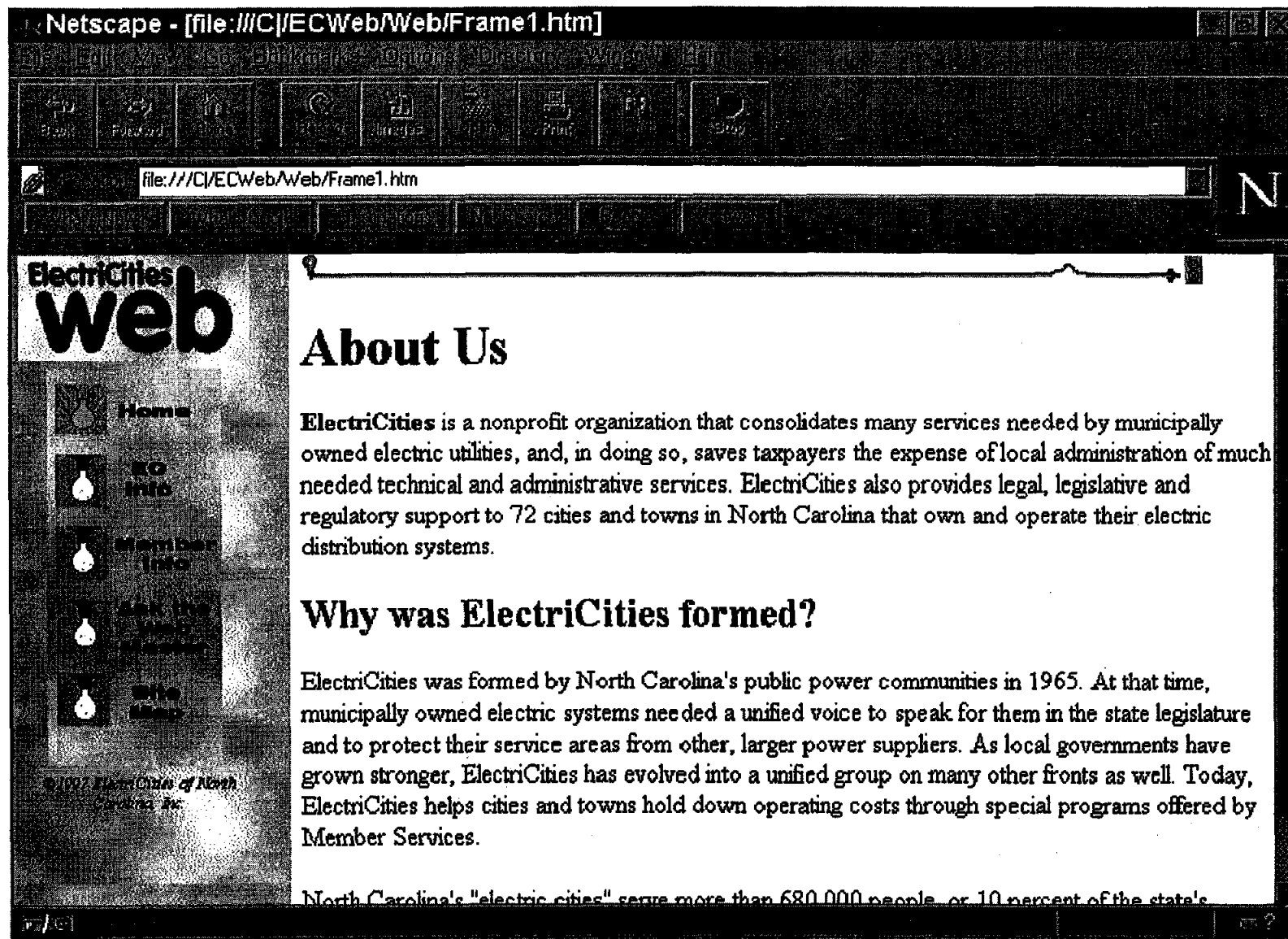


Figure 2. Proposed home page using a vertically split frame. Navigation information will be maintained in left frame across all the entire intranet site.

such benchmarks will be available at the time this paper is presented. However, it is anticipated that no significant performance differences will be found.

Conclusion

The success of the intranet site was largely due to the user-generated metadata. The metadata fostered a sense of community within the company; the rank-and-file employee knows that his/her data sources will be published at the web site. The metadata addresses the MIS concerns of scalability and maintainability. Finally, the metadata provides a ready method to the web author for controlling navigation.

The second key ingredient to the success of the intranet was the selection of a good third-generation web authoring package. Good software in this arena allows the author to easily publish both static and dynamic information,

maintain all link references, and control which web pages are published at various web sites. The control of user state information is an added bonus not found in HTML editors.

References

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