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Introduction

Organizations continue to develop new uses of information technology to enhance communications and decision making. A prime example is the development of organizational intrawebs. Intrawebs provide intra-organizational access to web pages for the purpose of distributing information and gathering data for internal use only. The development and use of intrawebs creates new challenges and implications for managers, I.S. professionals, and educators.

The Internet, now accessible in over 150 nations by an estimated 6.64 million computers (Sussman and Pollack, 1995), offers businesses new opportunities for providing customer service and sharing product and organizational information with customers, investors, and other interested parties. One Internet tool that has spurred the expansion of Internet usage (estimated to double in size on an annual basis) is the World Wide Web (WWW). The WWW provides a graphical user interface (gui) to the Internet and has enjoyed and generated explosive growth in Internet usage. Presumably it has engendered such popularity because of (a) its sophisticated graphic user interface, which provides power and ease of use, and (b) its use of hypertext which allows any document to link to any other documents.

Web browsers are available on many platforms, including Unix, PC/Windows, and Macintosh. Like the basic mechanism for the Internet itself, the WWW was first implemented on a Unix platform--in this case, utilizing the NeXTStep environment. Since then it has been ported relatively easily to various Unix platforms and to Windows and Macintosh environments. As a result, the user interface is the same regardless of platform or web browser. The browser running on a Mac accesses the documents on a Unix web server or PC/Windows web server just as readily as it accesses those on a Mac web server, and vice-versa (Clark 1995). This is in contrast to the normal computing environment that may consist of several platforms; generally, getting heterogeneous platforms to interoperate is problematic.

The uniformity of user interface across platforms means that if information system applications could be written to run on (or through) a Web server to create Web documents as output, and to get user-interaction input from Web screens, then the application would be readily accessible to clients on multiple platforms without the writing of any additional user interface code. In essence, then, the WWW would become a Wide Area Network for everybody, from the smallest organization to the largest.

With Internet access spread widely and software readily available free of charge or very inexpensively, anyone can publish a home page to the world. Most people think of the Web as a way for "outsiders" to access information made available by "insiders". For example, a home page may be developed for a college or department on a web server as a means for informing other people located around the world about that organization. In that sense, the web is basically an electronic brochure that is much more widely and easily available than paper brochures in a rack.

A recent study by Yankee Group Consulting found that 8% of firms surveyed utilized the Web for advertising purposes and an additional 33% anticipated doing so in the near future (Business Week, June 26, 1995). However, while many companies are trying to determine how to effectively use the WWW to earn money, some have begun using web technology internally to save money (Clark, 1995). Another study found that 16% of companies surveyed had developed an Intranet and 50% either had plans to or was considering developing one (Cortese, 1996).

Widely referred to as an Intranet, web services operating on a local area network, accessed exclusively by internal users, offers to the organization all of the benefits commonly provided by the WWW. However,

many companies are using the web technology only for internal dissemination of information; therefore, "intraweb" is a more appropriate term.

For example, FedEx currently has approximately 60 internal Web sites, developed by employees, for sharing information. FedEx expects to equip all 30,000 of its office employees with web browsers so they will have access to these pages (Cortese, 1996). Obviously, FedEx will be able to reduce its production of hard copy reports because of the ready accessibility of information through electronic means.

Documents As Information Systems Output

In the highly structured world of traditional data processing, the basic unit of data is the record. A record is a collection of fields (the atomic building blocks of data), a collection of records is called a file, and a collection of files is called a database. Generally the records used in a given application are both well-defined and homogeneous.

In web terminology, the basic unit of data is the "document". And, like the documents that populate our metal filing cabinets, they are very unstructured and heterogeneous. A web document is simply a collection of text, sounds, and images. However, any text passage or image can serve as a link to any other document at the same server or any server anywhere on the web. To follow the link and see the other document, the user simply clicks the mouse pointer on the text or image currently showing on the screen. Documents containing such links to other documents are called hyper-documents. (hyper: that is or exists in a space of more than three dimensions.)

Although the vast majority of web documents currently are hand-crafted by use of word processors or home page development tools, it is clear that the formatted reports produced by management reporting systems and transaction processing systems, as well as the ad hoc output from decision support systems, could be web documents.

As shown in Figure 1, NeXT Software has developed a model for using web technology to create dynamic web pages from corporate databases. Using the OpenStep environment jointly developed by Sun Microsystems and NeXT, and object libraries called Portable Distributed Objects, WebObject Framework, and Enterprise Object Framework, developers can create custom objects which access and display standard SQL databases as a web page,. A discussion of object technology is beyond the scope of this paper; suffice it to say that the object-oriented environment and libraries allow the developer to work at a high level to create very powerful applications which run over the Web. What is the advantage of doing so and what are the implications?

The advantage is that the intraweb can serve as a distribution conduit for the standard outputs of the formal information system. In addition, of course, the usual kind of informal, hand-crafted documents can be made available on web servers as web documents. Once again, all of this information is available across all platforms that may exist in an organization. I.S. developers do not have to spend time developing numerous interfaces. Furthermore, the documents can be displayed in complex forms (text with graphic images and sound) on all those platforms.

Whatever the nature of the document, using the web is fundamentally different from the usual (but not universal) scheme for distribution of information system output. Usually we think in terms of getting reports to the people who need the information, i.e., from the point of view of the information system, we "push" the information to the users. By contrast, the web philosophy is one of making information available for users to "pull" from the information system when they require it rather than when the information system thinks they should get it.

Static and Dynamic Documents

The vast majority of current Web usage is for the publication of static documents, much like an on-line book. Of course, the hypertext characteristic of Web documents makes them quite different from our normal notion of a "book". In effect the book consists of material drawn from many documents, linked together dynamically.

Does that dynamic linking make the document dynamic? Yes, and no. Document A is dynamic in the sense that if Document A contains a link to document B, and Document B is updated by its author, then Document A automatically reflects B's change. However, if changes in those document are made manually by their authors, rather than in response by the reader at the time of access, those documents are static.

The content of dynamic documents is responsive to the needs of the user. An example would be an ad hoc inquiry system in which the document displayed by the user's web browser is the result of a query, perhaps formulated in SQL. Such output is, of course, standard for an on-line, interactive inquiry system, but is relatively rare on the web. However, such a capability is essential for the web to become a vehicle for complete information systems.

Electronic Commerce

Electronic Commerce takes the concept of dynamic documents one step further to provide full interaction between the server application and the client user. Electronic commerce requires both the publishing of dynamic documents, i.e., documents which are tailormade on the fly to the needs of the client reader, and the capturing of transaction data provided by the client to the server. In other words, conducting electronic commerce on the web is considerably more involved than simply transferring a document from a server to a client machine for display. Electronic commerce requires full interactivity between server and client, with the server processing queries, retrieving data from the databases, and formatting the output as a document. Creation of such systems will require changes in systems development methodologies, thus impacting both educators and I.S. professionals.

FIGURE1
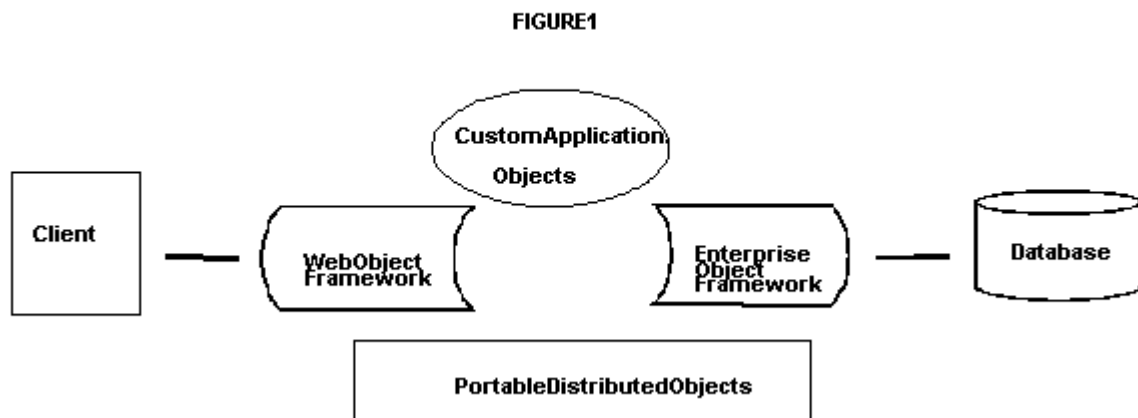
Source: NeXT Software, Inc.

List of References

Clark, T. (1995), "Intranets Spread Within Firms," Inter@ctive Week, Nov. 13.

Cortese, A. (1996), "Here Comes the Intranet," Business Week, Feb. 26, pp. 76-84.

Sussman, V. and K. Pollack (1995), "Gold Rush in Cyberspace," U.S.News and World Report, Nov. 13, pp. 72-80.