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Mark A. Myerscough
University of Wisconsin -Oshkosh

Thomas Richards
University of North Texas

Jack D. Becker
University of North Texas

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A Framework for Intranet-Based Information Systems (I-BIS) Applications

Mark A. Myerscough
Assistant Professor
Information Systems & Operations Management
University of Wisconsin - Oshkosh

Thomas Richards
Professor
Business Computer Information Systems
University of North Texas

Jack D. Becker
Director, Information Systems Research Center
Associate Professor
Business Computer Information Systems
University of North Texas

Introduction

A recent survey of business executives showed that of 169 decision makers who responded to a survey by the Business Research Group, over fifty percent have either already implemented an internal web site or are in the process of developing such a site (Engler, 1996). These results were similar to those reported in Information Week, which showed that 49% of those firms responding to the survey already had direct Internet access for their employees. According to this same survey, this figure is expected to increase to 67% of these same firms by the spring of 1997 with another 10% of the firms testing the viability of such a connectivity policy (Yankelovich, 1996).

Gantz (1986) reported that the microcomputer had achieved the same level of penetration into the corporate world (in terms of the percentage of employees with desktop access) in ten years that the telephone required 75 years to achieve. With these systems increasingly tied together in local or wide area networks, it is likely that a comparable level of penetration of Intranet-Based Information System (I-BIS) will occur in an even shorter time span. The rapid proliferation of network communication technology points to a need to measure how and where these systems are being implemented, and what results are being achieved.

Recently published reports concerning Intranet-Based Information Systems (I-BIS) have cited return on investment values exceeding 1300% and direct payback time periods of six to twelve weeks (Campbell, 1996). While these systems have already been widely accepted and implemented, scant attention has been paid to rigorous research in relation to users' acceptance and utilization of these systems or the perceived quality of these systems.

Defining An Intranet-Based Information System

The first problem posed in conducting research concerning an I-BIS is creating a working definition that defines what is (and is not) an Intranet. Intranets have been defined in a variety of ways, based on a variety of criteria. Howard (1996) identified four widely varying definitions for an Intranet. These definitions were:

1. An enterprise network,
2. The use of Internet tools for access to corporate information,
3. Using the Internet for remote access to corporate information, with no specific use of Web servers, and
4. Using the Internet for remote access to corporate information using Web servers.

Howard adds to the definition of an Intranet in number four above a condition which specifies the use of a Web-based browser for the human interface to corporate information.

Milliken (1996) proposed a much simpler definition of an Intranet, stating that "An Intranet is the use of the Internet's technologies applied within an organization" (Milliken, 1996 p. 37). Rway Communications uses a similar definition for Intranet by stating that "An Intranet is merely a network of computers that can share data with each other using existing standardized WWW (World Wide Web) protocols" (Rway Communications, 1996, p. 1). JSB Communications concurs with this definition by defining an Intranet as "the descriptive term being used for the implementation of Internet technologies within a corporate organisation (sic), rather than for external connection to the global Internet" (JSB Communications, 1996, p. 1).

Netscape proposes a similar definition for Intranet in their Intranet Solutions White Paper by declaring that;

"Intranets, which run on open TCP/IP networks, enable companies to employ the same types of servers and browsers used for the World Wide Web for internal applications distributed over the corporate LAN. Because Intranets are based on the same independent standard Internet protocols and technologies, they are accessible to every member within an organization, regardless of their choice of hardware platform" (Netscape, 1996, p. 1).

All five of these individuals and organizations have proposed definitions which center around a common thread--the application of protocols and technologies developed for the Internet for an internal, organization-oriented information system.

For the purposes of this paper an Intranet-Based Information System (I-BIS) is defined as:

The utilization of commonly accepted Internet-Based information presentation formats and protocols such as the use of Hyper Text Markup Language (HTML) coded text files, World Wide Web (WWW) servers and browsers, Usenet mailing lists and discussion groups, and related technologies for the purpose of delivering information within the organization. This system may be accessible from external Internet connections with the use of password protection and/or other security measures. The purpose of the system is to provide and/or share information for internal, organization-specific purposes.

This definition focuses on two specific elements. The first element is that an Intranet is defined by the interfaces used to create and access information in the system. Therefore,

without the use of WWW-style servers and browsers, the system does not fit the category of Intranet. A wide variety of information systems have been and are being used by firms for the internal dissemination of information (i.e. Lotus Notes, IBM Profs). However, unless the system is specifically created to take advantage of the unique properties of a web-based information network, it does not fit this study's definition. In essence, the I-BIS is defined by the interface's "look and feel". This component of the definition is consistent with previously listed definitions.

Likewise, unless the system is for internal, organizational usage, the system does not fit the study's definition of an Intranet. While the definition of an Intranet utilized in this study does allow for linkages to external information sites, the express purpose for an I-BIS is internal organizational purposes. Both components of this definition are required in order for the system to fit the definition of an Intranet-Based Information System.

Evaluation Methodology

One of Netscape's primary markets is the corporate connectivity market through the marketing of its Netscape Suite for corporate communications. The company has therefore provided a great deal of information on applications of I-BISs. This information, in the form of 21 mini-cases, illustrates how a wide variety of companies have already deployed I-BISs. The mini-cases are all available to the general public through accessing Netscape's WWW site.

Each of these mini-cases describe how an organization has deployed their I-BIS. By conducting an analysis of the mini-cases, it has been possible to develop a categorization scheme which identifies how I-BISs are currently being utilized in a business setting. This analysis is the basis for this paper.

I-BIS Activities Identified

The initial analysis of the mini-cases utilized a framework which included 20 different activities or tasks. After completing the analysis of the mini-case applications, these 20 activities were then categorized into nine groups of I-BIS applications. Table 1 lists all 20 of the original activities, and identifies the final nine groupings. Table 1 also indicates the number of different activities which were identified for each individual task. Table 1's consolidated categories, along with a brief description of each, are described below. (Table 1's first column, titled Group, matches the number of the group included in the following listing.)

1. Office administration:
Handling office administration issues such as time sheet reporting, project billing information, office supply requisitions, or similar tasks

2. Document distribution and reduction:
Reducing document duplication and distribution costs and facilitating document sharing by providing electronically accessible versions of routine reports

3. Information access:
Reducing the time required to disseminate information within the organization by allowing for electronic publication of information such as revised schedules, updated price lists, product specifications, etc.

4. Individual connectivity:
Increasing the ease of communication within the organization by publishing an updated employee directory, facilitating employee e-mail contact, or providing employee contact information

5. Group/team connectivity:
Increasing the ease of communications within project teams or cross functional groups by providing an easy to access group directory, facilitating group meetings, electronically disseminating group reports and meeting agendas, and / or publishing schedules and progress reports electronically

6. Employee training:
Employee training by providing training manuals, publishing job and task descriptions, or allowing the completion of training programs or modules

7. Competitive Intelligence:
The acquisition of competitive intelligence by providing links to news services, stock market reports, or other system linkages which allow the monitoring of market competitors and/or market conditions

8. HRM requirements:
Human resource management requirements such as maintaining an employee skills inventory, organizational staffing requirements, open position notices, or similar materials

9. Employee benefits:
Employee benefits such as accessing employee retirement or 401-K information, tax-sheltered payroll account information, child day care programs, ride-share commuting information, or providing information on health insurance providers

Table 1 - Task Analysis Coding Results

Group	Task Description	3M	AT&T	Bay	Booz	Cadence	Ciba	Columbia	Dentsu	Elec Arts	Eli Lilly	Fed Ex	G-Tech	HBO	John Deer	McD-Doug	Mobil	Nat Semi	Olivetti	Sandia	Sil Graph	NSTDA	Nbr of Times Used	Nbr of Cos.

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	e	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21		
1	Administrative Workflow			1		1	1	1				4		1			1	1	1	1			13	10
1	Standardization of forms									1	1		1										3	3
1	Workflow Improvement		1	1																			2	2
1	Workflow Reductions		1								1								1	1			4	4
2	Document Reduction	1	1	1			1		1	1		1	1		1	1			3	3	1		17	13
2	Document Sharing		1																				1	1
3	Cycle Time Reduction		2	1						1			1		1		1		2	2			11	8
3	Data Control - centralization								2														2	1
3	Information Access		2	1	1		1	1	2	1	1	1	1	1	3			2		1	2		21	15
3	Sales person support			1										2									3	2
4	Communications		1						3	1													5	3
4	Employee Connectivity											1											1	1
4	Individual Connectivity	1	1		1		1	1		2			2			1			1		1		12	10
5	Group Connectivity			1					2							1		1		2			7	5
5	Project Management																	1					1	1
6	Employee Training					1		1													1		3	3
7	Competitive Intelligence					2	1							1									4	3
7	Financial Systems	1																					1	1
8	HRM Usage	1			1		1	1				2	1										7	6
9	Employee Benefits			1								1	3						1	1	1		8	6
	Total Number of Tasks Used	4	10	7	4	3	5	5	6	9	6	6	12	4	7	2	3	2	5	9	11	11		
	Number of Different Tasks	4	8	7	4	2	5	5	4	5	6	5	6	4	4	2	3	2	4	6	7	5		

Directions for Future Research

The framework indentified in this paper represents a starting point for the investigation of the utilization of I-BIS. Of importance to the information systems management is an

analysis of how well an I-BIS can fulfill the information processing requirements for each of these activities. An assessment of I-BIS ease of use and usability is being addressed by the authors in another research study which utilizes the framework identified in this study.

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