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Internet Application Case Studies

Internet Opportunities Program



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Abstract

This report examines fourteen companies, across a variety of industry sectors, that have established Web sites on the Internet. The study uses extensive primary research to explore the forces influencing companies of all sizes and disciplines to become part of the World Wide Web.

Research for this report included interviews with both the companies profiled in the study and industry experts.

Key topics discussed include: the motivation for establishing a Web presence, applications including promotion, advertising, customer service, sales, and market research; Web site development and management process, and promotional strategies.

This report contains 79 pages and 4 exhibits.

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Internet Opportunities Program

Internet Application Case Studies

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Table of Contents

I	Introduction	1
	A. Purpose	1
	B. Scope	2
	C. Methodology	2
	D. Organization	3
	E. Related Reports	3

II	Executive Overview	5
	A. Internet Applications	5
	1. Promotion	5
	2. Customized Marketing	5
	3. Advertising	6
	4. Customer Service	6
	5. Internal Communications	6
	6. External Communications	7
	7. Electronic Commerce	7
	8. Market Research	7
	9. Human Resources (HR)	8
	10. Application Summary—Issues and Opportunities	8
	B. Conclusions	9
	1. Web Site Strategy	9
	2. Web Strategies Tied to Corporate Goals and Objectives	9
	3. Web Site Goals Aligned with Development	10
	4. Web Site Goals Aligned with Promotion	10
	5. Web Site Measurement	11
	C. Recommendations	11
	1. Gain Upper Management Support	11
	2. Create a Cross-Functional Team	11
	3. Be Prepared to Staff a Webmaster and More	12
	4. Establish a Network of Support for the Web Site	12
	5. Keep At Least Some of the Web Development In-house	12
	6. Carefully Plan Web Site Promotion	12
	7. Factor Web Site Costs into Promotional Budgets	13
	8. Develop Web Site Guidelines	13

III	Internet Case Studies	15
	A. Compaq Computer	15
	1. Goals	15
	2. Results	15
	3. Applications	16
	4. Web Site Development and Management	16
	5. Web Site Promotion	17
	B. Digital Equipment Corporation	17
	1. Introduction	17
	2. Goals	17
	3. Results	18
	4. Revenues	18
	5. History	18
	6. Applications	19
	a) Ordering Facility	19
	b) Customer Service	20
	7. Future Plans	20
	8. Web Site Development and Management	20
	9. Web Promotion	21
	10. Measurement	21
	C. Encyclopedia Britannica	22
	1. Introduction	22
	2. History	22
	3. Goals	22
	4. Results	22
	5. Applications	23
	6. Web Site Development and Management	24
	7. Web Site Promotion	24
	8. Measurement	25
	9. Lessons Learned	25
	10. Perceptions	25
	D. General Electric Company	26
	1. Introduction	26
	2. History	26
	3. Goals	26
	4. Results	27
	5. Applications	27
	6. Future Plans	28
	7. Web Site Development and Management	28
	8. Web Promotion	29
	9. Measurements	29
	10. Lessons Learned	29

E.	Goodyear Tire & Rubber Company	30
1.	Introduction	30
2.	Goals	30
3.	Results	30
4.	Applications	31
5.	Web Site Development and Management	31
6.	Web Promotion	32
7.	Measurement	32
8.	Lessons Learned	33
a.	Web Education	33
b.	Quality	33
c.	Management Issues	33
d.	Organizational Issues	33
9.	Perceptions	33
F.	Hilton Hotels	34
1.	Introduction	34
2.	Goals	34
3.	Results	34
4.	Applications	34
5.	Web Site Development and Management	35
6.	Web Promotion	35
7.	Measurement	35
G.	J.P. Morgan	36
1.	Introduction	36
2.	Goals	36
3.	Results	37
4.	History	37
5.	Applications	37
6.	Web Site Development and Management	38
7.	Web Promotion	39
8.	Measurement	39
9.	Lessons Learned	39
H.	Lotus Development Corp	41
1.	Goals	41
2.	Results	41
3.	Applications	41
a.	Marketing	41
b.	Customer Support	41
c.	Sales	42
d.	Information Sources	43
4.	Web Site Development and Management	43
5.	Web Promotion	44

6.	Measurement	45
7.	Lessons Learned	45
I.	MCA/Universal	46
1.	Introduction	46
2.	History	46
3.	Goals	46
4.	Results	47
5.	Applications	47
a.	Winterland Productions	48
b.	Universal Channel	48
c.	Universal V/IP	48
d.	AMP	48
e.	Universal Studios Hollywood	48
f.	Spencer Gifts	48
g.	MCA Home Entertainment	49
6.	Future Plans	49
7.	Web Site Development and Management	49
8.	Web Promotion	50
9.	Measurement	50
10.	Lessons Learned	51
J.	San Jose Mercury News	51
1.	Introduction	51
2.	Goals	51
3.	Results	51
4.	Applications	52
a.	NewsHound	52
5.	Future Plans	52
6.	Web Site Development and Management	52
7.	Web Promotion	52
8.	Lessons Learned	53
K.	Saturn Corporation	53
1.	Introduction	53
2.	Goals	53
3.	Results	54
4.	Applications	54
5.	Prodigy	54
6.	Web Site Development and Management	55
7.	Web Promotion	55
8.	Lessons Learned	55
L.	Schlumberger Ltd	55
1.	Introduction	55
2.	History	55
3.	Goals	56

4.	Results	56
5.	Applications	56
6.	Web Site Development and Management	58
7.	Web Promotion	58
8.	Measurement	58
M.	Southwest Airlines	59
1.	Goals	59
2.	Results	59
3.	Applications	59
4.	Future Plans	60
5.	Web Site Development and Management	60
6.	Web Promotion	61
7.	Measurement	61
8.	Perceptions	61
N.	Yahoo	62
1.	Introduction	62
2.	History	62
3.	Goals	62
4.	Results	62
5.	Applications	63
6.	Web Site Development and Management	63
7.	Web Promotion	64
8.	Perceptions	65
	a. Alternative Medium	65
	b. Information Before Commerce	65
	c. Interactive Information	65
<hr/>		
A	Glossary	67
	A. Definitions	67
<hr/>		
B	Corporation Names and Addresses	77

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Exhibits

I

-1	Worldwide Internet Population	1
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II

-1	Key Applications, Issues, and Opportunities	8
-2	Web Site Success	9

B

-1	Names and Addresses of Vendors	77
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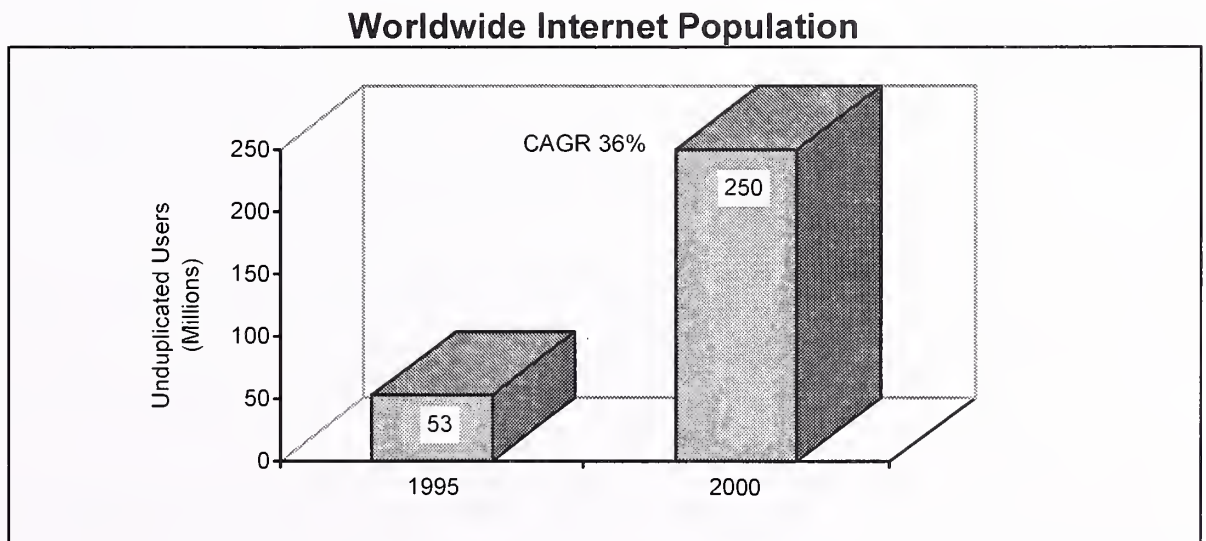


Introduction

A Purpose

From its early beginnings as a research and education network, the Internet has undergone significant changes during the first half of the 1990s. Up until the last few years the Internet consisted of mostly academic and defense research communities. Recently, however, there has been an enormous growth in the number of individual systems and inter-operating networks connected to the Internet. Commercial activities and the creation of the World Wide Web (WWW) are largely responsible for recent phenomenal growth rates.

Exhibit I-1



Source: INPUT

Commercial domains are the fastest growing segment of the Internet. Businesses around the world are scrambling to establish a Web presence. As illustrated by Exhibit I-1, INPUT expects the worldwide Internet population to grow from 53 million unduplicated users by the end of 1995 to 250 million unduplicated users by 2000, with a compound annual growth rate (CAGR) of 36%.

The objective of this analysis is to provide an understanding of how businesses are using the World Wide Web to impact the bottom line. This will help to identify forces influencing vendors and users, determine actions that have been taken by vendors in developing new technologies, and assess both user demand and how users are developing Web sites.

B

Scope

This report profiles fourteen companies, across a variety of industry sectors, that have established Web sites on the Internet. Each profile discusses the company's goals and objectives for developing a Web site. Applications including promotion, advertising, customer service, sales, and market research are covered. The Web site development and management process is described, followed by the Web promotion strategy for each company. Lastly, the perceptions and lessons are supplied to provide clients with valuable insight into developing and managing successful Web sites.

C

Methodology

The report is based on in-depth interviews with each of the companies profiled. It also uses secondary research such as trade publications, online technical forums and vendor literature.

When presenting market size data in graphic form, INPUT's rounding procedures for portraying market size and forecasting are as follows:

- Markets of \$1 billion (U.S. dollars) or greater are rounded to the nearest \$50 million.
- Markets of \$100 million are rounded to the nearest \$10 million.
- Markets of less than \$100 million are rounded to the nearest \$5 million.

D

Organization

The report is divided into three chapters and three appendices. The contents of each are as follows:

Chapter I, *Introduction*, introduces the report and explains its importance; identifies the scope of the report and the methodology used in gathering, analysis, and preparation of data and report findings; presents the report organization; and notes related INPUT reports.

Chapter II, *Executive Summary*, offers an overview of the analysis conducted as part of the study and summarizes report findings. It provides a brief summation of the report's major topics and findings, suitable (in size and scope) for a senior executive who wants to understand the most important issues and conclusions without reviewing the entire study.

Chapter III, *Internet Case Studies*, examines the motivation for establishing a Web presence. INPUT analyzes the different ways that companies are using the Internet.

Appendices A, B, and C provide a glossary of key Internet terminology, vendor names and addresses, and a copy of the questionnaire used in conducting the interviews.

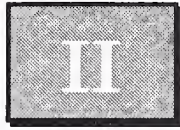
E

Related Reports

INPUT has published the following reports that may be of interest to the reader:

- *Using the Internet for Business Operations, 1995*
- *Internet Sales & Marketing Directions, 1995*
- *Electronic Commerce Through CD-ROMs, Web Storefronts and Internet Malls, 1995*
- *Internet Security: The Impact of Firewalls on Client/Server Applications, 1995*
- *Worldwide Internet Market Analysis, 1995-2000*

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Executive Overview

A

Internet Applications

The companies profiled in this report use the Web for a variety of applications including promotion, advertising, customer service, internal and external communications, electronic commerce, PR, human resources and market research.

1. Promotion

Several of the companies profiled felt that the Internet offered a better means to communicate and educate users relative to other media such as print and television. By educating people, these companies feel they can ultimately sell more products. These companies feel that only a limited message, such as that relating to price competitiveness or product innovation, can be said in 30-second television advertisements. But on a Web site, users can spend as much time they want to learn about the companies and their products. MCA/Universal, for example, not only promotes upcoming television shows, but also provides users with a behind-the-scenes look at how an program episode was developed. Goodyear uses its Web site to educate people on the differences in tires and why it believes its tires are better than its competitors. Saturn uses the Web to educate people about the company and how it does business. Southwest uses it to convey the Southwest 'personality'.

2. Customized Marketing

Several companies felt the power of the Web is the ability to market one-to-one. Through the use of interactivity, a company can customize its marketing for individual users and add value at an individual level, as opposed to a mass medium. A Web site is something that users can use conveniently and on their own terms. The customer determines the level of information he or she wants.

3. Advertising

Web sites are also becoming an advertising medium for ambitious businesses to attract customers. Promoting movies over the Internet is an attractive application for a company like Universal Pictures. The promotional budget for a high-profile movie can be as high as \$25 million, but the cost of a temporary Web site might be only \$20,000.

4. Customer Service

Customer service applications allow companies to provide service facilities whereby customers can query parts of the corporation, request specific information, access knowledge bases of technical bulletins, customer issues, and FAQ (frequently asked question) lists. Most companies profiled offer customer service Web pages for their users. The Lotus Web site offers a customer support line where users can ask any natural language type question about any of the Lotus products. Instead of talking to a customer support representative, the user can search around a whole body of technical notes and information to get the kinds of answers required.

Compaq's strategy is to provide service wherever consumers want it. The Web site is simply one more way for Compaq to provide information and support to its customers.

Interactivity

Although the Web is often lauded as an interactive medium, the information on many corporate Web sites is static and allows for little interactivity. Internet pioneers continue to develop Web sites that depend on interactions between users and the Web server. Goodyear and Saturn both provide interactive capabilities such as dealer locators. Britannica, Mercury Center and Yahoo feature advanced search facilities. Hilton and Southwest allow users to book reservations by filling in specially designed forms. Digital offers an online configurator which demonstrates different system combinations.

5. Internal Communications

The World Wide Web was started by CERN, the European Laboratory for Particle Physics in Geneva, Switzerland, as a large-scale networked hypertext information system. Over time, groups of Internet users developed the Web as a general-purpose architecture for information retrieval. Today, companies are discovering that the Web offers an excellent way to disseminate information internally and with outside organizations. Many companies are using Web sites internally to share information such as employee data including employee access files, individual home pages, and organizational browsers. Other uses include posting internal product information including key contacts, product plans, engineering data and field

test software. Individual departments are providing organizational structure pages, charters and reports. Field offices use the Web internally to provide directions, organizational structure, maps and events.

Schlumberger, with permanent operations in 35 countries and employees in 50 other nations, uses 20,000 E-mail addresses, 20 internal Web servers, and 30 gopher servers to disseminate information throughout the company. Schlumberger plans to connect the Web to a variety of systems including oil ship locators and drill bit measurement devices. Other companies will connect the Web to anything from well measuring devices to robotic control systems.

6. External Communications

In an increasingly globalized economy, companies use telephone, fax and courier services to communicate with their suppliers, but these services can become expensive. Many companies are discovering that the Web can be used in a variety of ways to communicate to the outside world. Today's applications include Requests for Proposals (RFPs) and other supplier-related information.

Schlumberger, for example, provides information on all of its divisions, so customers throughout the world can learn about the company. GE Plastics is exploring the possibility of using the Internet to distribute training information to its customers.

7. Electronic Commerce

Although many companies are interested in eventually selling products over the Internet, Digital is the only company surveyed that offers its entire product line for ordering over the Internet. The company has been successful because it sells mainly to Fortune 1000 companies who purchase products using purchase orders. The ordering facility allows customers to place orders and track them. Most companies surveyed felt electronic commerce will become attractive after security issues are resolved.

8. Market Research

Many corporations have discovered that the Internet is an ideal tool for obtaining valuable market information. Although some companies try to obtain feedback by inviting browsers to register in their guestbooks, more successful ones gain useful market feedback by providing contests, such as riddles and scavenger hunts, to obtain user demographic information.

To the curious surfer, a contest represents an easy way to possibly win a prize. To the company, it represents a relatively easy method to gather valuable demographic information. Users entering contests are typically

asked to enter information into a form and submit it simply by clicking a button. Once obtained, this information is put into a database to determine who might be interested in particular products the company is planning to release.

MCA/Universal uses Digital Planet's measurement software to measure Web site traffic and track an individual's buying habits on their Web site. The CompuServe \$1 Million Internet Hunt is the first I/Pro I/Code site. To participate in the contest, users have to obtain an I/Code. The I/Codes will be used to collect more detailed demographic information about site visitors.

9. Human Resources (HR)

Companies are finding that the Web is an excellent means of recruiting employees. A very large number of students graduating from college are familiar with the Internet and the Web, and have turned to the Net in search of career opportunities. Many companies are offering HR Web sections and typically include information about the company, job listings and facilities to E-mail resumes to the company.

10. Application Summary—Issues and Opportunities

Exhibit II-2 shows key issues and opportunities regarding the main Internet applications.

Exhibit II-1

Key Applications, Issues, and Opportunities

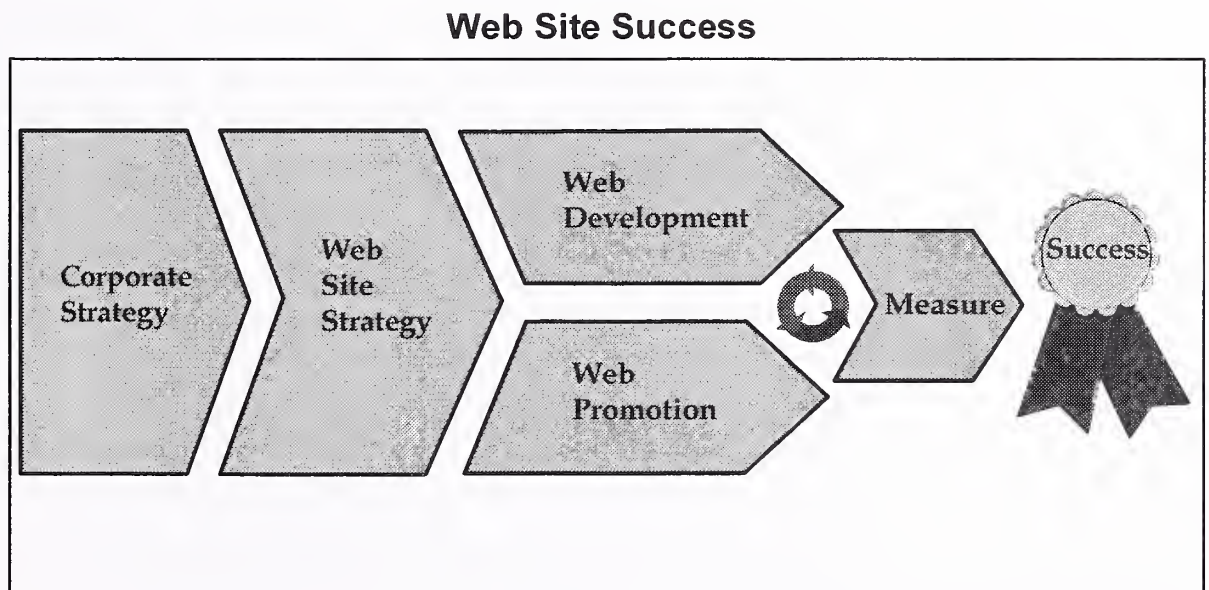
Applications	Issues and Opportunities
Promotion	Cheaper than other means, but selective
Customized Marketing	One-to-one marketing, good for industrial and complicated products
Advertising	Not always necessary, and it must be justified
Customer Service	Potential for interactivity
Internal Communications	The Intranet, a key application area; Web tied to every internal back-office system
External Communications	Global reach, instant feedback
Electronic Commerce	Immature, but potential tremendous, soft goods will benefit most
Market Research	Self selection a problem but tremendous cost savings and response rates

Source: INPUT

B**Conclusions****1. Web Site Strategy**

Many companies establish Web sites because “it is the thing to do”. Companies with the most successful Internet presences establish focused Web site strategies which are based on the company's strategic goals, as shown in Exhibit II-1. These Web site goals later influence Web site development and Web site promotion.

Exhibit II-2



Source: INPUT

2. Web Strategies Tied to Corporate Goals and Objectives

All companies surveyed established focused Web site strategies that were based on corporate strategies, such as improving customer service, decreasing distribution costs or improving promotional strategies. Instead of using the number of users visiting the Web site as the success criteria, these companies focused on supporting their overall goals and objectives. J.P. Morgan, for example, established its Web site in order to improve corporate image and to hook users into its RiskMetrics program. In its business, being positioned as experts translates into more business. Compaq's corporate strategy is to provide quality, reliability and value at any customer-preferred location. Compaq's primary reason for offering a Web site is customer service. Its Web site provides the customer with extensive information and resources on Compaq, its products, and its services.

Hilton's goal is to provide users with information on any hotel in the world, allow them to check availability, and eventually to book a reservation.

Saturn's Web site goal is to motivate the prospective customer to request additional information or to physically visit a Saturn site. The Web site features a dealer locator to assist browsers with finding their nearest dealer.

Southwest's goal is to have users enter the Web site, cruise to the fares and schedules section, and purchase a ticket. Finally, Digital believes a company's Internet and Web strategy reflects the company as a whole. The company views the Internet as another business tool and encourages its employees to maximize its potential benefits.

3. Web Site Goals Aligned with Development

Once established, the Web site strategy influences the development of the Web site. For example, a Web site might be designed to entice users to download a program or locate a dealer. If the developers place the downloadable software or dealer locator too many clicks into the Web site, users might not stay long enough to reach them. If users fail to reach that point, then the Web site goals are not achieved.

The Compaq Web site is designed to provide the highest level of online customer service. A clear information hierarchy, navigational aids, a search capability, and a dynamic table of contents are provided so users can easily locate intended information. Digital demonstrates its Alpha servers by actually allowing customers to 'test drive' the systems over the Internet.

Another company's Web site goal might be to provide the fastest access to information on the site. The successful company will develop a site with limited graphics, optimized for fast downloads. If a company wants the widest audience, this must be a key design requirement, particularly when that audience is international—very few countries have the bandwidth available to users in the U.S.

For some companies, the goal might be to sell software. Therefore, the Web site would be structured in a manner to effectively demonstrate the capabilities of the particular software. Lotus' intention is to sell software tools for the Internet. Consequently, the company created a Web site to demonstrate its Notes and InterNotes tools. All content on the Web site is originally developed in Notes and then converted to HTML using InterNotes.

4. Web Site Goals Aligned with Promotion

Web site promotion must also take the Web site strategy into account. If the company is planning to attract a certain type of user to its Web site, then it must advertise that Web site in areas that will attract the desired user profile. Digital, for example, promotes certain sections of its Web site and sets up links which will place a user in a certain product area of the Web site. Today, Digital generates very high volumes of traffic on its Web site so

it no longer advertises its general Web site. Instead, the goal is to drive specific traffic and interests to certain areas of the Web site.

Southwest Airlines strategically selected the same name for its Internet domain (iflyswa.com) as its toll-free number in the U.S. (1-800-i-fly-swa), itself reflecting the company's corporate slogan. JP Morgan's Web site strategy is to entice those within the financial industry to download its RiskMetric program, and consequently advertises in the Wall Street Journal, Financial Times and Barrons, providing the Web site's URL.

5. Web Site Measurement

Once a Web site strategy has been established, the organization must measure results to determine if the investment has been worthwhile. While some companies find measuring Web site 'hits' to be an effective measurement criteria, the use of other criteria, such as number of downloads or requests for additional information, gives far more accurate information. If Web site goals and objectives are not being achieved, then Web site development and/or promotion can be adjusted to better achieve goals. This cyclical process used by companies is what differentiates effective from ineffective Web sites.

C Recommendations

1. Gain Upper Management Support

For a lot of organizations, the Web site begins as a project within which an individual or group of individuals propose supplying content such as promotional material or customer service. All companies surveyed felt it was imperative to gain upper management's undivided support for Web projects. Many times, departmental managers are hesitant to contribute because they have many other responsibilities to attend to and will only do so knowing the project has upper management's support. Southwest even found that choosing more personable and well-liked employees helped the Web site project gain the necessary support.

2. Create a Cross-Functional Team

Companies developing a new Web site should strive to create a cross-functional team, headed by a Webmaster or project champion, and include representatives from the communications, product marketing, IS, systems development, and other departments. The worst thing a company can do is to outsource the project to a single developer or outside agency who develops the site in a vacuum. Since almost all departments in the organization will

eventually be impacted by the Web site, it is imperative to get internal input from the beginning.

3. Be Prepared to Staff a Webmaster and More

After struggling to gain the support from the various departments within a company, the Web development team eventually goes live with the corporate Web site. As a company's Web site begins to receive attention and feedback from the outside world, employees throughout the company soon realize its benefits. In many cases, the Web development group will become overwhelmed by the number of requests from various departments for more information to be placed on the server. And to make matters worse, most employees who develop and manage the Web sites do so in addition to their normal duties. Companies need to realize the importance of developing a Web site and to be prepared to allocate additional resources to keep the Web site evolving.

4. Establish a Network of Support for the Web Site

Once a company has set up a Web site, it is important to establish a network of support within the organization. Many sites offer users the ability to return E-mail messages in reference to questions they might have concerning technical features, product availability, general interest and feedback. Organizations need to be prepared to answer questions users have and should plan to integrate Web site support into the current customer service infrastructure.

5. Keep At Least Some of the Web Development In-house

Most companies feel it is necessary to keep the bulk of Web development internal to ensure proper management of content and to pursue more interactive aspects of the Web. Although others believe it is better to outsource development to a firm that 'lives and breathes' the Internet, they still felt it was necessary to keep some of the development in-house to maintain control over the Web site.

6. Carefully Plan Web Site Promotion

Most of the companies profiled said they were reluctant to spend money on Web site advertising until they learn more about conducting business on the Internet. Several felt they would eventually advertise, but were trying to develop a means to measure the benefits before investing money. More aggressive companies advertise their Web sites on high-traffic Web sites such as the Global Network Navigator and NewsPage. Most importantly, once a Web site has been established, it is absolutely necessary to develop a post-Web marketing strategy.

7. Factor Web Site Costs into Promotional Budgets

Traditionally, companies have had to make decisions concerning print advertising versus television, and how much budget to allocate to each. But most of the companies surveyed felt that companies will have to consider the Web costs in the future. Although it might just look like another extension of their marketing or PR departments, it's becoming a cost that needs to be figured into a company's budget.

Every company surveyed felt it was difficult to justify the costs of their Internet activities. Although the advantages, such as improved customer service and decreased distribution costs, seem obvious, calculating a return on investment is difficult, because there are no established ways to measure benefits. Some companies develop their own methods to value the number of users visiting the Web site, while others use the Digital Planet or I/PRO measurement software to obtain precise traffic information. All of the companies agreed that a form of measurement was required so results could be compared with other modes of advertising to receive an 'apples-with-apples' comparison to other forms of advertising.

Organizations should strive to get exposure in the press. Honors, such as Info World's Hotlist, give new Web sites valuable free publicity.

8. Develop Web Site Guidelines

It is important for companies to establish style guides and templates. Organizations should determine who has authority to post documents and need to set-up permission, approval and review cycles. Each division should establish a single point of contact.

The bulk of companies profiled have strived to incorporate Web development into the existing corporate infrastructure. Typically a Webmaster manages content on a day-to-day basis, while content is delivered by content providers, such as product managers and marketing communications employees. Most companies agree that the transition from a Web project to a permanent corporate function is a tremendous challenge.

Other guidelines organizations can integrate might include:

- Easy to understand organization—with URLs to match (know the audience)
- Don't abuse or misuse hyperlinks
- Develop a structure that makes finding information easy—typically within 3 clicks
- 'What's New' section—for frequent visitors

- Web site index to organize content for users
- Avoid “Under Construction” signs

Web browsers generally will give a new Web site one chance. If content is not exciting or optimally organized, users usually do not return. Print publications don't appear with 'Under Construction' signs printed in them, so why should Web sites? The 'Under Construction' message adds very little to the Web site (and very often does more harm than simply omitting the section altogether), because the most successful Web sites are continually under construction. If it is imperative to announce upcoming additions, successful companies announce these in an 'Upcoming Features' section.



Internet Case Studies

A

Compaq Computer (www.compaq.com)

1. Goals

Compaq's strategy is to provide quality, reliability, and value to the consumer. The ultimate goal is to deliver information to any customer-preferred location. The company uses other services such as CompuServe, and America Online to provide support. The Web site is simply one more way for Compaq to provide information and support to its customers.

Compaq's primary reason for offering a Web site is customer service. Its commitment is to provide the customer with the information and resources on Compaq and its products and services.

The Compaq Web site was designed to make finding information an easy and straightforward process. A clear information hierarchy, navigational aids, a search capability, and a dynamic table of contents are provided so users can easily locate intended information.

Because the company sells through distributors, VARs and resellers, it does not intend to sell products over the Internet. Instead, the plan is to create market awareness for its products.

2. Results

The company has not established any quantitative or qualitative goals, but the Web site has been much more successful than anticipated. At least 40,000 users visit the site daily. These are encouraging numbers and provide a strong indication that the Web site is expanding Compaq's name recognition.

Even though Compaq has found most Web users are simply browsing the pages, it feels its site will provide a great payback. It feels it can solve 47% of support issues by putting information on the Web site.

3. Applications

At the Compaq Web site users can find information about what is 'hot' at Compaq, newly announced products, Windows 95 information, and Compaq products, service and support programs. Users can download software and data files, locate Compaq sales offices worldwide and look up Compaq phone numbers. Users can even learn about Compaq Government, Education, and Medical (GEM) on the Web site.

In the What's New section, users can access announcement newsletters, press releases, Compaq events, and other new and updated information. The Web site is also used to download files, such as software essentials ("Compaq's Most Wanted"), ROMPaqs, diagnostic and setup, drivers, and software solutions. In the Compaq Technical Publications section, users can access Compaq TechNotes, Compaq White Papers and Compaq Technical Information Memos (TIMs).

CompaqCare Service and Support Programs provide information on warranties, Compaq support on commercial online networks, and the automated fax response system, available in the U.S., Canada, and EMEA.

The network support section provides information on advanced network support agreements (ANSA), insight auto alert plans, system partners, rack installation and certified installers. Computer users can also find out how to get service for their Compaq products through third-party maintainers and guaranteed service providers.

The Web site provides a section answering the most frequently asked questions for all portables, desktops and server. Users can also request technical support through E-mail.

Compaq plans to expand the Web site as more organizations within the company find uses and make requests. As employees within the company suggest new ideas, the Web site will support more applications.

4. Web Site Development and Management

All of Compaq's Web site was developed internally. The company uses one person to manage the Web site on a daily basis and other employees throughout the company to supply the content. No single person is responsible for Internet content. When required, the company will reach out and seek help from additional employees within the company to supply whatever support is required.

5. Web Site Promotion

The company does not promote its Web site online. It feels it has done a good job of developing the site and is satisfied with the excellent reviews. For example, the U.S. magazine *Interactive Age* rated the Compaq Web site the eighth best business site on the Internet. The company does, however, include the URL on all product documentation.

B

Digital Equipment Corporation (www.digital.com)

1. Introduction

Digital is one of the largest users of the Internet. The company's use of the Internet spans every facet of the corporation including marketing, sales, ordering, service and support. Every employee in the corporation has the ability to send and receive E-mail over the Internet. In a typical month, two million E-mail messages pass through Digital's gateways. Furthermore, this is a three-fold increase of use in the last 18 months, paralleling the overall increase of the public Internet. Digital is using the Internet to work with customers, prospects and partners.

2. Goals

Digital believes that a company's Internet and Web strategies reflect the company as a whole. It believes the Internet represents the type of technology that has implications for almost every aspect of the corporation, from sales and marketing to human resources. In every Digital organization, at least one person is responsible for determining how that organization is going to employ the Internet.

Digital views the Internet as a business tool and encourages employees to use it as such. As well as E-mail access for all employees, 40,000 TCP/IP nodes within the company have Web access. The company has even initiated awareness campaigns to promote the smart use of network resources, Internet etiquette, and Internet culture. While this may seem unnecessary or even frivolous to some companies new to the Internet, it is in fact a very smart move on Digital's part, and one that should be reflected in all organizations planning to make serious business use of the Internet.

Digital established an Internet Business Group to help customers successfully use Internet technology to enhance their organizations. Its strategy is to use partners to develop and market to businesses the products and services needed to securely distribute information, collaborate and conduct electronic commerce on the Internet. Digital's goal is to be recognized as a leader of Internet business solutions within the next year,

and is aggressively pursuing this goal through, among other media, an effective television advertising campaign directed specifically at Internet awareness.

3. Results

Digital is successful in attracting many users to its Web site. Its server was accessed 25 million times in the first 18 months it was online. Moreover, Digital's cost of sales over the Internet is very low. It has had the electronic ordering facility for about a decade and has made only minor adjustments in transferring the facility to the Web. The reaction of the customer base to the online ordering facility has been mixed. Some view the telnet system as a tremendous step backwards. The Web site features a lot of point-and-click product information, but launches a telnet application for ordering products. Digital feels that although their users might have ideology problems, they will still use the service.

Digital offers customers an Internet-based, test drive program. Since the launch of the Alpha Internet program, more than 7,500 accounts and more than 100,000 logins have been recorded. This industry-first program enables Internet users from around the world to test drive Alpha systems for free, and Digital logs approximately 1,400 test drives times per day, or one every minute.

4. Revenues

Digital has sold approximately \$100 million worth of equipment over the Internet to customers in the U.S. While the company has been very successful with sales over the Internet, transactions are not secure. Digital has been successful because it sells mainly to Fortune 1000 companies who have pre-arranged purchasing agreements. Orders can be processed over the Internet because customers buy equipment with purchase orders, not credit cards.

Digital is looking forward to receiving much higher Internet-generated revenues in the future, as it extends its Internet ordering system outside just the U.S. and makes it available to all Web users, not just those with existing purchase orders. This will give it the ability to reach the consumer market and benefit from a truly global market opportunity.

5. History

Digital was one of the first Fortune 500 company to utilize the Web, by ensuring its marketing information was readily available to customers and prospects. Approximately ten years ago, Digital developed an online ordering facility to sell and download software. It was conceived as a dial-in, terminal-based, time-sharing system, which was fairly representative of the

computing environment in the mid 1980s. Last year, Digital adopted the Internet environment by essentially replacing the modem with a telnet-based system. Customers no longer have to dial into the online ordering facility using a terminal emulator, but can telnet into it through the Internet. The telnet approach offered several advantages. The company did not have to change any lines of code or any aspects of the functionality of the electronic connection, nor did it have to change the business processes to run the telnet system.

6. Applications

Users can find out what's new from Digital including special promotions, new AlphaStation and AlphaServer families and other products, most recent press releases and topics of interest on the Web server. Also available are details of Digital career opportunities worldwide and company benefits.

In the 'Company Financial' section, users can access Digital financial news and investor information, a Digital overview, Digital contacts and a progress report. Users can access customer publications such as a customer update and technical journal. Digital's catalogs and buyers' guides include Systems and Options Catalog, U.S. Digital Assisted Services Catalog, Alpha Application Directory, DECdirect Interactive Catalog, Digital Learning Interactive Catalog and NASA SEWP Interactive Catalog. Digital's electronic newsletters include Digital Press & Analysts News, DECnews for Education & Research and inFORM.

The Digital Web site also provides links to other Web servers including those of Digital customers, distributors, resellers, application partners and professional associations.

Throughout Digital's site are links to Digital's own Internet search engine, AltaVista. This engine catalogs a very high proportion of the public Internet (currently approaching 10 billion words) and also archives all Usenet newsgroups (currently around 14,000). Both the Web and Usenet can be searched through the same Web forms-based front end, which provides a easy-to-use and powerful searching mechanism. Since its public debut at the end of 1995, AltaVista has become one of the most popular search engines and is noted for its breadth of search and its very high performance.

a. Ordering Facility

Users can obtain information about Digital's products and services, configure systems, generate quotes, place orders, as well as read press releases and receive information about Digital's latest offerings from the company's ordering facility, the Electronic Connection. This went live on the Internet in early 1994.

The Digital Internet ordering facility serves three main functions. It gives the user quote generation and configuration assistance. If a user wants a workstation, the configuration will give types of workstations and help fine tune an exact configuration. It supports a product line catalogue of about 20,000 products so that a customer can order everything from a patch cable to a server.

b. Customer Service

In the Customer Service section of the Web site, users can access information on multi-vendor customer services, Digital's Learning Interactive Catalog, Alpha developer support, software patches and customer discussion forums.

Digital's customer service organization has its own Internet gateway and its own Web server. Digital claims that the customer services Internet operation paid for itself in its first six weeks, after going live in June 1994.

Considerable cost savings were made in software patch distribution (users download from the Web site, obviating the need for Digital to post tape cartridges). In the first four months of operation, 12,000 patches were cost-effectively delivered electronically.

7. Future Plans

Digital's ordering facility does not run within the Web environment, but through a telnet session. As the number of new Internet users grows, so does the perception of the Internet being little more than E-mail and the Web. Many new users therefore will not be familiar with telnet-based applications, and many will not even have a telnet capability.

Digital is currently developing a Web-based front end to replace the telnet sections of the Web site. Currently in field test, the new system will perform the same functions such as quote generation and configuration, but within the Web. While use of the Web for applications instead of simpler, character-based modes such as telnet and gopher very often introduces a performance hit, significant gains are made in consistency and ease of use.

Also in the future, the ordering facility will be expanded to support global sales, and the consumer market will be reached through the introduction of simpler payment mechanisms.

8. Web Site Development and Management

Digital employs one full-time person to run the Web server. This person is responsible for keeping the content compelling and up-to-date, making editorial decisions about what will be included on the home page, and managing the overall project. Another 10 people manage the content that will appear on the Web site and other services such as CompuServe, AOL,

and CD-ROM products. They are responsible for deciding who owns the information, who has the ability to update the information, when the information goes live, and how long it stays live.

Beyond those 10 people, Digital employs about 2,000 people who are part of the authoring community. They include product marketing managers and communications professionals who provide technical overviews, performance reports, product information sheets, and more.

9. Web Promotion

Digital feels that the entire notion of online advertising is constantly changing. It is not very well understood—what works now may not work in six months' time. When it started advertising on the Global Network Navigator (O'Reilly & Associates), it simply advertised its general, top-level Web site. The goal was to advertise the company and improve its overall image.

Today, Digital feels it generates plenty of traffic on this top-level Web site so no longer advertises it. Instead, the goal is to drive specific traffic and interests to certain areas of the Web site.

Currently, Digital is advertising on NewsPage, an online feed of 800 newswires, with content rolling over every 24 hours. NewsPage subdivides the content into categories. Digital advertises in certain categories of the news and also sponsors the news with hyperlinks from the category to the relevant section on its own Web site. For example, Digital sponsors the news on data security and encryption technology and advertises with an icon, logo and slogan. When the user clicks on the advertising bar, he/she is taken to the Digital product section covering Internet firewall products.

Digital recognizes that once a Web site has been established, it is absolutely necessary to develop a post-Web marketing strategy. Digital does not evaluate Web advertisements based on hits. It feels that this would be like advertising on a billboard simply because a known number of pedestrians, buses and cars pass it. When selling a product such as firewalls, billboards do not make sense. When Digital considers advertising in a newspaper it will choose the business section over the sports section. The company believes there needs to be an alignment between why a company has a Web site what it is trying to accomplish. This will lead to proper consideration of where it will ultimately advertise.

10. Measurement

Digital, like other companies, is finding it difficult to justify the costs of the Internet. On one hand, it is obvious. Projects like the electronic ordering and software distribution facilities pay for themselves in months.

Yet for applications such as promotion and customer service, the benefits are not so obvious—there are no established ways to measure benefits. But when Digital established the initial criteria at the start by using the Internet for business purposes, it was greeted with enthusiasm from customers, who demanded that Digital set up an Internet business unit. Such a unit was launched as the Internet Business Group in August 1994.

C

Encyclopedia Britannica (www.britannica.com)

1. Introduction

Britannica Online is a Web-based information service provided by Britannica Advanced Publishing, an Encyclopædia Britannica company. It consists of a fully searchable and browsable collection of authoritative references, including Britannica's latest article database, hundreds of articles not yet in the print version of Britannica, Merriam-Webster's Collegiate Dictionary (Tenth Edition) and the Britannica Book of the Year.

2. History

Since its first publication in 1768, the Encyclopedia Britannica has been recognized as one of the world's most comprehensive reference works. In 1989 Britannica developed Compton's Multimedia Encyclopedia, the first multimedia encyclopedia on CD-ROM, but the company was ahead of the times. Readers were not yet ready for Britannica Encyclopædia's then-'futuristic' CD-ROM, and it was finally introduced to the public last year.

3. Goals

As Britannica progresses through the early stages of the electronic publishing revolution, its primary goal is to continuously improve the Britannica Online Web site product. Britannica believes that the combination of its database with the Web has resulted in a unique product, yet even so consider it an early version to be developed and enhanced greatly. Britannica believes online distribution is the wave of the future, and that CD-ROM is simply an interim technology.

4. Results

Britannica Online has received numerous awards, including Database magazine's Product of the Year in 1994. In September 1994, the product's Web site was beta tested and offered by subscription to colleges and universities. The service is now available to any individual or organization including schools, libraries and corporations. Britannica Online's largest

market has been academia—it has sold site licenses to 150 universities, covering around a million students.

Britannica Online includes textual and graphical information on millions of topics, and its primary goal is as a powerful research tool. Designed to perform advanced search and retrieval functions, it allows a user to perform full-text searches on the encyclopedia, including natural language queries, through a point and click interface. Britannica Online includes about 1,200 printed articles that don't appear in the print edition. Unlike books and CD-ROMs, there is essentially no limit to the amount of material able to be offered through the Web site.

An enormous advantage for Britannica is the ability to update documents continuously. The site will change daily, unlike the printed volumes which are updated only a few times a year.

Finally, the product can link to other reference sources. An encyclopedia is usually used as part of a larger search for information and in most cases, a user will want to locate other sources of information during his or her research. While the paper version includes bibliographies, the Web version includes hyperlinks to take the user direct to other information sources. Ultimately, Britannica wants to become the center of any research effort.

5. Applications

The company sells the Web version of its Encyclopedia Britannica to home users for \$150 a year. Single-user corporate subscriptions are \$300 a year and single-user academic accounts are \$120 per annum. Britannica Online offers the same text found in Encyclopedia Britannica plus an additional 1,200 articles and 3,000 graphics. The site features 1,200 links to other sites on the Web. It is also hyper-linked internally so a user can jump from one article to another.

Britannica Online also includes a search facility on the home page which uses an optimized WAIS engine. As well as the search engine, the Web site features an index containing over 200,000 hotlinks to articles in the encyclopedia.

As well as the encyclopedia, Britannica Online contains the Merriam-Webster's Collegiate Dictionary. To search the dictionary, users query the same search engine as for the encyclopedia.

Britannica articles contain many features that help users easily maneuver around the various references in Britannica Online. Long articles are divided into smaller sections, allowing users to download information quickly. Users can access other sections of the article in a number of ways; for example, the Propædia is an outline of knowledge and is used to browse articles according

to topic. The main fields of knowledge in the Propædia include Matter and Energy, The Earth, Life on Earth, Human Life, Human Society, Art, Technology, Religion, The History of Mankind and The Branches of Knowledge.

The latest editions of the Britannica Book of the Year are available on Britannica Online. A table of contents is provided for each edition, covering the events of a particular year.

Other features of Britannica Online include the Nations of the World database, Britannica Classics and the Britannica Birthday Calendar which provides a list of famous people born on any given day of the year.

6. Web Site Development and Management

Britannica Online's Web server is developed cooperatively by Britannica's Advanced Technology Group and the company's editorial and publishing staff.

The Advanced Technology Group, a fairly new division, gained experience by assisting with the development of the Compton Multimedia Encyclopedia. The vision of the Web project evolved out of discussions between the Advanced Technology Group, who had the Web knowledge, and editorial and publishing staff. Today, the group continues to physically manage the Web site and develop the HTML code.

The two company groups are located at separate sites and communicate with each other mainly through E-mail. Encyclopedia content is E-mailed to the Advanced Technology Group who convert it into HTML. Over 100 employees have worked on the online product over the last year and the development process is a continual cycle of development, completion, publication and back to development. Outside agencies are used to convert pictures from the printed encyclopedia to graphics for the Web site.

7. Web Site Promotion

Britannica Online has not yet promoted its Web site extensively as it is marketing only to educational institutions. Word of mouth promotion has made a positive impact and has caused the company to receive extensive attention in the press. Once it begins to branch out to other markets, the company plans to market the Web site more aggressively. Web site advertising will be a serious consideration.

8. Measurement

Britannica keeps track of the number of users accessing their Web site by monitoring the usage of various areas of the Web site and usage of the universities who hold site licenses.

9. Lessons Learned

Britannica believes that a company needs to establish a dedicated Web development group, as well as staying focused and committed to its vision.

10. Perceptions

The company views itself as a publisher of intellectual property and is not as concerned with the vehicle that delivers the information.

The Web itself is at an early stage of development. There are several publishing opportunities still to be realized. Companies can provide information that they would not normally print, and customers have immediate access to that information.

The business model for publishing is continuously changing. Today, most of the Web content is free, but most of those providing commercial content on the Web will charge. Companies that provide services to customers are making an extensive investment in drawing an audience, but they eventually need to be profitable.

Advertising on the Web is unique because users can learn about the company by simply clicking on the advertisement. Because of the nature of the Internet (the vast majority of dialup users outside the U.S., as well as many in the U.S., pay connection charges, so pay for every second they are online, and some people pay charges based on bytes transferred to and from their computer) and because of the culture this has played a part in shaping (Internet users react unfavorably to excessive and/or unsolicited advertising, particularly when it is published in inappropriate places), advertisements have to be unobtrusive, and will have to be exciting enough to keep a customer coming back. Because of this, the online marketing models will be very different from the print publishing models. The development of these business models will follow many paths before a universally acceptable and successful model is adopted.

D**General Electric Company (www.ge.com)**

1. Introduction

General Electric Company, a diversified technology, manufacturing and services company operating on a worldwide basis, has turned the Internet into perhaps its best vehicle of distributing technical product information. General Electric, one of the first non-computer companies with a presence on the Web, uses the Internet for sales promotion, customer service, advertising, and PR.

2. History

GE Plastics, a \$5 billion company in the engineering plastics industry, established its first home page in October 1994 to provide product information, property guides, design guides and other information.

Soon after, GE Capital Services announced its Web page and GE Information Services announced its plans to release phase one of its Internet Access Service, GENie Services. GE Power Systems came online in November 1994 followed soon after by Digital Financial Services (DFS).

3. Goals

GE views the Internet as a technology for providing valuable information to its customers. It explored other media such as CD-ROM and specialized electronic bulletin boards but settled on the Internet as the most cost effective technique to reach thousands of customers with easily updated product catalogs and technical specifications. GE has found the Internet to be useful for a highly specialized manufacturer whose products are not highly visible to the consumer.

GE focuses not only on the hard technical information but on sales promotion, customer service, advertising, and PR. Currently, it is expanding its Web site to support all of its business and divisions.

The ultimate intention is not to 'look pretty' but to add value. GE feels it is important to look at the information through the customers' eyes and to maintain that level of customer focus. The company does not want to offer the most elaborate graphics but instead strives to make Web pages look good and easy to read. GE feels it has only scratched the surface of the Internet's potential and that there are several opportunities still to explore.

4. Results

Since October 1994, when GE Plastics went live on the Web, its home page has been accessed about 3,000 times a day. The division is very satisfied with this level of response.

The GE Web site receives about 4,000 hits per day and rising. More than 200 E-mail requests for additional information have come from the home page. GE Capital is actually capturing business over the Internet and the Power Systems division has turned up numerous customer leads.

5. Applications

The GE Plastics business offers over 2,500 pages of information to customers, including specifications and product information—data that once had to be mailed or faxed. It also provides telephone numbers for GE worldwide sales and services offices.

For PR or informational purposes, GE operates a highlights section on the Web site. This features everything from corporate revenues to the company's social policies.

The divisions operating Web pages include GE Aircraft Engines, GE Capital Services, GE Electrical Distribution and Control, GE Information Services., GE Lighting, GE Plastics, GE Power Systems, Corporate Research & Development and NBC.

GE Capital Services, a diversified financial services company, offers an annual report and highlights, brief descriptions of its 24 businesses, as well as extensive product and services information from GE Computer Services, GE Capital Auto Lease, and Insurance Services.

GE Information Services, an electronic commerce services company, provides the Commerce Express Services portfolio featuring electronic messaging, EDI, and information management services information.

Digital Financial Services (DFS), a captive outsourcing alliance between GE Capital and Digital Equipment Corporation, provides information on computer leasing, the LeaseWorks suite of financing programs, and second-user Digital systems..

GE Lighting features a tour of the GE Lighting Institute, designed primarily for dealers and distributors. This section also provides detailed product information.

GE Plastics recently expanded their product information with the addition of Product Data Sheets on over 500 different grades of materials. The Web site

also features 'Tech Tip of the Week' which offers hot tips and helpful hints for working with engineering thermoplastics.

GE's Image & Visualization Lab has created a collection of movie clips showing fly-throughs of various parts of the body.

Lastly, NBC provides an assortment of information about its television network in addition to its other cable services including Consumer News and Business Channel (CNBC), Prime SportsChannel Network America and NBC SuperChannel.

6. Future Plans

GE draws the line, at least for now, at customers ordering and purchasing products on the Web. The company might in the future sell products over the Internet, but is not currently investigating this possibility.

GE plans to add recruiting to its Web site. The company can save money on mailings and brochure and can target new graduates who are used to using the Internet within university.

GE Plastics is exploring the possibility of using the Internet to distribute educational information. There is a dearth of polymer-processing training in vocational schools across the country. GE plans to provide on its Web site "Sharing The Knowledge", a series of 12 audio-visual courses that GE Plastics has used for five years to train thousands of customers in plastics technology.

General Electric Information Services also plans to provide EDI services on the Microsoft Network. Users of the GE/Microsoft EDI service will be small businesses, not generally targeted as EDI customers by banks. In addition, the service will not offer financial EDI. The GE/Microsoft EDI service is designed for light duty transactions, uses ANSI formats, and will not require users to purchase costly EDI translators.

7. Web Site Development and Management

GE Plastics developed its home page with help from One World Interactive, a 'new media' startup based in New York, U.S.

Today, GEis uses Meta4 Digital Design as its Internet agency, in addition to internal resources. Meta4 is working with GE to shape the company's Web offering into a virtual representation of GE, presenting GE's solutions and product offerings to consumers and businesses. Meta4 Digital Design will help GE achieve its goal of having each of its businesses represented on Web.

The company's resources are still evolving. GE does not have many employees who are solely dedicated to the Web site. In most cases, the employees assist with the Web development in addition to their existing jobs. Many members of the staff who are not familiar with the Internet now spend a large percentage of their time contributing to the Web site's development.

The company is currently putting together procedures to manage the development process. It intends to set standards to help get all of their divisions and businesses online and the goal is to achieve greater consistency of pages in order to make navigation easier for the user.

8. Web Promotion

General Electric has not promoted its Web site, mainly because its businesses are so diverse. In the future, it plans to promote more aggressively, but will most likely promote certain divisions or sections of their Web site in a specialized fashion.

9. Measurements

Today, GE tracks only the number of visits and where users are coming from. It has not set goals for the number of users to attract, but will do so when formal processes are established. In the future, GE intends to look at how it can reduce costs such as printing informational publications because more users are accessing it on the Internet. It is also looking at the number and quality of customer leads that are being generated from the Web site. The company has just started measuring this and hasn't yet established any formal measurements. Overall, the company feels it will save a lot of time and money but that it is simply too early to determine the cost of sales.

10. Lessons learned

a. Processes

In retrospect, GE would have put more processes in place before going live. Currently, making updates are taking too long, but progress is being made.

b. Look and Feel

GE feels a company needs to keep the Web pages fresh to keep users coming back. Users typically seeking technical product information will enjoy a Web site whose look is continually evolving.

E**Goodyear Tire & Rubber Company (www.goodyear.com)****1. Introduction**

Users can find information on the care & feeding of tires, a tire wear advisory to understand problematic symptoms, a buyers guide to see the Goodyear tire line, a tire selector to find the right tires for vehicles, a store locator to find the nearest stores, a calendar of events for racing, and a blimp schedule at Goodyear's Web site.

2. Goals

As a manufacturer of a differentiated product, Goodyear feels the Internet is an excellent medium to teach their consumers the differences in tires and why it believes its tires are better than its competitors'. Goodyear believes it can ultimately sell more tires by educating their customers.

Goodyear's intention is to gain insight into the advantages of this new medium and eventually to use the Internet as a distribution channel in some form. Some businesses function mainly as online billboards, getting the company's logo and name before customers. Others attempt to extend services to customers. Goodyear wants to explore both of these possibilities.

In addition to the marketing, the company feels there is an extensive communications aspect to the Web. This aspect can be used for many other applications, including financial reporting and recruiting.

3. Results

Since going online in March 1995, Goodyear's Web site has been judged one of the top 25 business sites by Interactive Age magazine and has been included on the Internet Business Center's list of best commercial sites.

The company has found it difficult to determine goals and measure the results of its Web site. Although it can get a hit rate, it is not sure how to use these numbers to its advantage and how to justify costs of the Web site in terms of those numbers. Success ultimately depends on the company's business objectives. Given these objectives, Goodyear feels that receiving 1,000 hits per day might be more successful than a company such as Pathfinder receiving 100,000 hits per day. Goodyear is cautious in this analysis.

4. Applications

Users can find information on the care & feeding of tires, a tire wear advisory to understand problematic symptoms, a buyers guide to see the Goodyear tire line, a tire selector to find the right tires for vehicles, a store locator for the U.S. only, a calendar of events for racing, a blimp schedule, and other information at the Goodyear Web site.

On Goodyear's tire selector page, users can type their car's make, model and year into a Web form to obtain their car's correct tire size. Once obtained, U.S. users only can type in their location to determine the Goodyear store nearest to them.

Goodyear has added a home page for its Chemical Division. There, chemical customers can find information about Goodyear's line of polymers, resins, latex and rubber chemicals. A customer service page includes listings for Goodyear chemical sales representatives around the world. Customers can even order a sample of various products on line, tailored to their needs.

5. Web Site Development and Management

Goodyear assembled a team of cross-functional people with the purpose of developing a Web site and learning what it takes to be successful. They feel they have accomplished their goal. Their success is partially due to the work of an outside contracting group. The contractor assisted with the Web layout and architecture plans. Goodyear supplied the content and the agency assisted with navigation and feel elements.

Unfortunately, according to Goodyear, the agency did not have the required expertise with the interactive aspects of the Web. Goodyear had to rely on a few employees from its technology center to develop the interactive applications, such as tire selector and dealer locator.

Three people actively manage the Web site: a Webmaster and two marketing managers. The company is now in a transition period where it is moving its Web operations from project status to being part of the corporate infrastructure. Goodyear believes there is a need for a strong cross-functional coordination role—a central gatekeeper within the marketing organization who consistently controls the content. So people from various departments develop the outline, and functionality of the content is controlled by the central gatekeeper.

Unfortunately, it has been a difficult transition for Goodyear. The new structure is very unfamiliar to most people within the company, which is traditionally divisional and functional. Territorial disputes have taken place within the company, and internal interpersonal politics has played a part in

clouding some of the issues. Goodyear is working hard to get through this stage but feels it is taking too long.

The company will outsource graphics and HTML coding to advertising agencies, but wants to keep database programming and communications in-house. It wants to take advantage of its in-house knowledge and skills to pursue the more interactive aspects of the Web.

Like other companies, Goodyear is experiencing an overwhelming number of requests from various departments within the company. The financial services group is interested in putting its financial on the Web to communicate with Wall Street and potential investors, and the HR department wants to be able to receive resumes electronically.

6. Web Promotion

Goodyear is reluctant to spend money on Web site advertising until it learns more about conducting business on the Internet. Once it gains a better feel for business objectives and success measurement, it will evaluate the need to spend money promoting the Web site.

Looking at advertising as a percentage of the Web expense, Goodyear believes the costs are relatively high. For example, in the U.S., a Time/Warner Pathfinder billboard costs \$30,000 per quarter. This is low compared with traditional advertising, but it is difficult to justify spending \$120,000 to advertise a Web site that cost only \$30,000 to develop. Goodyear is in the process of putting some of its print-oriented advertisements on the Web, although the Web requires a different approach to advertising.

7. Measurement

Goodyear tracks traffic to the tire selector and dealer locator, giving it useful demographics related to its distribution. It also tracks all of the Web site use and feedback, which gives it the advantage of instant customer reaction.

The company has tried to adjust number of hits into number of visitors, considering this to be similar to the adjustments made in traditional market research. It tracks what it estimates the usage to be, what the total hits are, and hits on specific applications. It keeps track of the attrition rate: how people leave the site as they go through the four or five pages to get to the tire recommendations. The company was initially concerned that user having to push four or five buttons to reach a particular section would tend to leave the site and the overall attrition would be high. That has not been the case, however.

The company has not put substantial effort into looking at measurement software, but feels it will need to do this in the future.

8. Lessons Learned

a. Web Education

Goodyear would like to spend more time using the Web for staff education, and sees this as a valuable way to gain the skills required to construct successful Web pages for its own use.

b. Quality

The company feels it needs to improve the quality of graphics on its Web site and plans to use more experienced graphic artists in the future. It used good visionary and programming people, but lacked graphics expertise.

c. Management Issues

The company should have spent more time in the beginning stages thinking about the structural issues, how to manage the medium, and the impact it would make on the company.

d. Organizational Issues

Since Goodyear brought its Web server online it has since spent a lot of time working out the organizational issues to improve its Web presence. It feels it is very difficult to educate people internally about the Internet until a demonstrable Web site exists, especially upper management, which has the knowledge and experience to make the top-level decisions.

9. Perceptions

The real power of the technology is the ability market one-to-one. Goodyear feels a lot of people are missing this point of the Web. With interactivity, a company can customize its marketing for individual users and add value at an individual level by using the Internet. The customization feature is the primary appeal for Goodyear.

F**Hilton Hotels (www.hilton.com)**

1. Introduction

The Hilton Hotels Internet Travel Center provides a directory of hotels, hotel descriptions, pictures of hotels, a reservation system and more.

2. Goals

Hilton believes the potential is tremendous for hotels to provide information on the Web. The problem at Hilton is gathering the right amount of resources and money to make it succeed. It has only allocated a small Web budget, but feels momentum will gain as traffic increases and benefits become realized by upper management.

3. Results

Hilton has been pleased with results of its Web site. It provides extensive hotel information, hyperlinks to a variety of other travel areas, and reservation capabilities via E-mail. It feels it offers a lot compared to competitors' sites.

Currently, Hilton's Web site is receiving a large number of hits, but has yet to generate any reservations. The number of hits doubled in just two months, despite no announcement or promotion.

4. Applications

The Web site provides an overview of Hilton hotels and resorts throughout the world. Users can either choose Hilton destinations by clicking on a map or can select hotels by state (both U.S. only). Every hotel page provides hotel information and attractions, room amenities, facilities, a recreation map, hotel location, including a detailed road map showing the hotel's location.

Business travelers can find out about various Hilton services including Hilton Honors, Hilton Hotels' award-winning guest reward program, Towers Concierge Class, and the BusinessSaver. The Web site provides hypertext links to other Internet travel resources and to other general-interest sites.

Users can make Hilton reservations requests via forms which record details such as phone number, E-mail address, hotel location, check-in date, check-out date, number of rooms, number of adults, number of children, type of room rate, type of room and bedding, smoking preference, and any special requests or comments. Users are provided information on room rates including Corporate Rate, Towers Room, BusinessSaver, Government and

Military, BounceBack, Resort Select and Romance Package. Once users have submitted requests, Hilton first E-mails users to ensure that the information has been received, followed by a phone call from the Hilton reservation center.

5. Web Site Development and Management

Hilton initially developed its Web site internally, but has since decided to outsource the development and management to an agency. It is the company's philosophy to outsource as much as possible instead of creating entirely new departments. The company feels that by contracting to an organization that specializes in the Internet, it can avoid staff expending effort updating themselves on the rapidly changing Internet technologies. This way, it can concentrate on what it does best—managing hotels. Content and visuals will be managed by the agency, but management of the company's reservation technology will remain in-house.

Hilton has established a formal development review process for the Web site. Many departments, such as legal and upper management, review pages before they are placed on the Web. Approximately 50-60 pages of information have already been reviewed by departments and added to the site.

6. Web Promotion

Currently, Hilton does not advertise its Web site. It has not done so because of the expense and the fact that the returns are unknown. It does recognize, however, that the challenge will be to promote the Web site.

Although Hilton sets qualitative goals for almost every other aspect of its business, it has not established any goals for the Web site. Currently, it has some leeway because upper management has not set expectations too high. The company wants to watch and analyze the market as certain trends begin to develop. It believes that, culturally, a company does not want to calculate ROI only to find that it is not getting anything out of the Internet. Hilton believes the Internet is going to be the future, but is still trying to 'sell' it internally.

7. Measurement

Hilton does track hits, but cannot tell what specific pages users are visiting. Eventually the company plans to seek an outside vendor, such as I/Pro or Digital Planet, to assist in the measurement area.

G**J.P. Morgan (www.jpmorgan.com)**

1. Introduction

Although J.P. Morgan has a reputation as a conservative and slow-moving investment bank, its involvement in the Internet has been bold and decisive. J.P. Morgan was actually one of the first brokerage firms to develop a site on the Web. This site provides an overview of the company, its products and services, J.P. Morgan in the marketplace, news and downloadable information.

2. Goals

The Web site's principle objective is to enhance J.P. Morgan's reputation by establishing itself as a leader in information services. In its field, being positioned as experts translates into a competitive advantage by creating more business, attracting more attractive job candidates and generating more favorable press coverage.

The firm's goal is not necessarily to encourage browsing, but to entice the right users to download software packages, such as RiskMetrics and the Bond Index. The intention is to encourage users to become reliant on its information. The company even provides documentation describing how the firm calculates the indices to help customers replicate the process. J.P. Morgan hopes that potential business prospects will use the data in their own spreadsheets. Once that happens, these people may be more inclined to call the company and ask for advice, and to eventually trade through the bank.

Part of the company's business and image strategy is to be completely transparent, and the Internet supports this goal. The objective is to become the benchmark for specific investment markets and encourage customers to trust the bank.

The company believes its products align favorably with the demographics of the typical Internet user. Its products, like its customers, are highly analytical. J.P. Morgan's hope is to attract the interests of corporate treasuries, including treasuries at banks, who run fairly sophisticated portfolios and who already have the tools in place, including fast connections. Another objective is to attract the interest of university finance departments, especially those universities that are already connected to the Internet.

3. Results

J.P. Morgan feels it is successful, in a qualified sense, mainly because of the notoriety it has gained by developing a high-quality Web site. Being the first financial institution in its class on the Web has created a quite a stir. It makes the business world think differently of the company, giving the impression that it is, surprisingly, not just a group of old-fashioned bankers.

J.P. Morgan has in its own small way had some effect on perception of the Internet. About a week before it launched RiskMetrics, a financial columnist for the Global Network Navigator referred to the Internet as the "Wild wild west". After looking at J.P. Morgan's site a week later, the same columnist stated that maybe now things will be more civilized.

Since October 1994, there have been 30,000 requests for the RiskMetric page. The site is receiving around 100 unique visitors a day and the patterns have remained steady.

4. History

The bank's experience with the Internet began when it was trying to solve a mundane but important problem: IT vendors were taking too long to provide technical help. The company realized the Internet provided the best and quickest way to report problems to vendors and get software patches or online technical help in return.

The company also saw the Internet as a means to stay on top of the latest theories and predictions from economists worldwide. The company's business strategists use the Internet to access papers from the leading universities and research institutions. They feel the need to have access to leading-edge thinking.

Today, thousands of J.P. Morgan employees worldwide use the Internet to access the data they need. Analysts access everything from government census data, used to analyze trends in property values, to corporate financial reports.

5. Applications

The J.P. Morgan Web site provides an overview of the company including its philosophy and character, business principles, capabilities, history and financial data, available either as a browsable Web document or as a downloadable Adobe Acrobat file.

The Web site also features information on the company's products and services. In October 1994, J.P. Morgan went live with RiskMetrics, a risk-measurement service. RiskMetrics runs complex mathematical formulae to help institutional investors measure the potential risks of various

investments. Every day, J.P. Morgan posts RiskMetrics data sets on the Web, as well as on CompuServe and Telerate, a financial online service used by traders with specialized workstations.

In addition to RiskMetrics, J.P. Morgan offers several market data indices. These track commodity prices, government bond prices, and application activity in the mortgage market. With the exception of the mortgage index, they are updated daily. They are also available on Reuters and Teleright, CompuServe, and Knight-Ridder.

Matrix, a collection of mortgage market data, includes the J.P. Morgan Refinance Index and the J.P. Morgan Purchase Index. An overview of these two indices is available for browsing, as is the weekly refinance and purchase index data.

"Morgan in the Marketplace" provides information about recent transactions in which the company has participated, recent news accounts in which J.P. Morgan figures, and a commentary on important issues facing the financial services industry.

Paper-bound employee directories that quickly fell out of date have been replaced with an online phone book that is updated at least once a week. The phone book also features a search utility, developed in-house, so a trader in London, for instance, may track down a Hong Kong colleague even if he is unsure of the exact spelling of that colleague's name.

J.P. Morgan's latest Internet application involves the Internet as a recruiting tool for colleges and graduate schools. With demand for entry-level talent running high, J.P. Morgan does not want to rely on printed brochures that sit on the shelf of a campus career development office. Instead, the bank posts regularly updated electronic recruiting materials, including information on various career paths at J.P. Morgan as well as profiles of recently recruited staff.

6. Web Site Development and Management

J.P. Morgan has been a heavy user of the Internet for some time. Therefore, bringing the Web site online at an additional cost was not an issue because most of the infrastructure already existed. All Web development and management is performed in-house: the Internet Services Group is responsible for making the best use of the Internet. It manages the functionality, applications, security and any other technology-related issue. There is a dedicated Webmaster in the group. The content is managed and controlled by the Corporate Communications group.

The Internet Services Group searched outside to find assistance with the HTML coding and bought the coding from a group of freelancers. In order to update the Web site, the company has since acquired HTML skills in-house.

The big issue for J.P. Morgan is maintenance. Because the Web, audience, and technology is changing so quickly, additional and updated content is a constant task.

The company established a policy which stated that any department requesting to place content on the Internet is required to develop the capability itself. In other words, the content must be delivered in a coded form for submission to the Web site. Corporate Communications will provide a final quality control check, and maintain the architecture that allows businesses to find the right information. Employees will also be required to maintain the Internet news service, put the appropriate pointers in the What's New section and other places, and then move it all across the firewall.

7. Web Promotion

When the company launched Risk Metrics, it advertised with one concentrated burst in the worldwide editions of the Financial Times and Wall Street Journal, followed up a few days later with an advertisement in Barrons. The advertisements were not necessarily about the Internet, but did provide information about the Web site and gave its URL. After the advertisements were placed, the company was taken aback at the response—the hit rate was beyond expectations.

8. Measurement

The company is tracking users and where they travel in the Web site. This has proven to be difficult because users are not recognizable, although the company feels it has a good idea of who's visiting the site. In addition, it is fairly confident that the visits are from people who are interested in what J.P. Morgan has to offer.

The company also tracks FTP-related user activity for the indices. The firm's hope is that FTP activity increasing continually, even if Web browsing activity remains flat or even declines.

The firm does not use measurement software from companies such as I/Pro or Digital Planet, but is monitoring such companies' services with a view to subscribing to them in the future.

9. Lessons Learned

When the company first put its Web site up, the general assumption was that moving the data from internal platforms onto the Internet would be tricky and that the marketing verbiage would be easy. J.P. Morgan in fact learned that the opposite is true. Its findings showed that no great complexity is involved in moving data because of scripts and macros. Its experience suggests that this happens reliably and efficiently. Given the primitive state of browser technology and coding languages, the marketing effort turned out to be the greatest problem.

Initially, J.P. Morgan did not have the knowledge to make the distinction between print media and the Web. It now realizes that there are considerable differences. It has found that not everyone by any means wants dazzling graphics. Users might be dialing in for business-related information and/or might be using a modem, even at 9,600bps. There are trade-offs when developing a Web site. Organizations like Lehman Brothers are not interested in what the Web site looks like but are concerned only with the underlying content. On the other hand, the student population, generally having access to high-speed Internet connections and paying for their online time, might be more attracted by elaborate graphics.

H

Lotus Development Corp. (www.lotus.com)

1. Goals

Lotus believes a business paradigm shift is occurring and that some day all businesses will use the Web as another marketing channel. Lotus has defined three objectives for using the Internet.

1. To participate in the development of this new channel where it will not be caught in a position of playing catch-up with other companies. Its content management product, Notes, avoids this by providing a unique opportunity to influence the Web's development.
2. To be able to market demographically. Lotus markets its products primarily to Fortune 1000 companies. The company believes that 80% of those companies are now connected to the Web, either directly or through an online service, and that the typical Internet user is an educated, professional male in his 30s. For Lotus, the Internet represents a great vehicle for attracting this typical user, who might be interested in its products.
3. To better articulate the company's market position. Lotus believes that the desktop marketplace has been commoditized. Although the desktop market is where Lotus started, it feels, for example, that there are only so many fonts that can be added to a word processor and so many colors that can be added to a graphics package.

The company believes that its future lies in the dominion of groupware. Although Lotus owns the current groupware marketplace, it has found that customers still believe that Microsoft is the market leader despite the fact that Microsoft does not offer a groupware product. Lotus' goal is to use the Web to communicate the company's market positioning.

2. Results

The company is not currently making significant revenues through the sale of goods over the Internet. The only product sold over the Internet is ScreenCam, and while some copies have been sold, business is not great enough to be able to draw any conclusions about cost of sales.

3. Applications

a. Marketing

Lotus views the Web as another marketing channel. Traditionally, companies have made decisions concerning print advertising versus television, and how much budget to allocate to each. Lotus believes companies will have to consider the Web in the future. The Web will become an ideal vehicle for delivering content.

Users can find out about any Lotus product at its Web site. The site offers downloadable movies, video clips, reviews of products from third-party vendors, as well as items normally provided in print, such as sales guides, marketing guides, brochures, and technical specifications. The Lotus Selects catalog is also available on the Web and offers a complete selection of Lotus upgrades, add-ins, and training products.

The basic philosophy is to use the Web site as a showcase for the company's Web publishing products. All content originates in a Notes database, and is then converted to HTML by using Lotus' InterNotes tools. Lotus' intention is to sell Notes and InterNotes to assist customers with Web site development driven by a Notes backend database. It feels most companies lack HTML-skilled staffed, but do have Notes programmers. These employees understand how Notes works and can contribute to coordinating a body of information, consolidating it on a single desktop, and converting it to HTML.

b. Customer Support

The Customer Support section of Lotus' Web site offers information about all products, support programs and product specifications. Users can also access answers to frequently asked questions and download files in the Customer Support section.

Users can tap into the customer support line and ask natural language type questions about any Lotus product. Instead of talking to a customer support representative, the user can search around an entire body of technical notes and information to get the kinds of answers needed.

c. Sales

Lotus has not sold its mainstream products online, but has experimented with its ScreenCam product. Although selling and distributing software over the Internet is attractive, the company is confronted with potential channel conflict. Lotus currently sells through distribution channels such as retail, catalogue, and wholesale. Those people are worried about Lotus' adoption of the new business paradigm of selling online. Lotus is taking a hard look to determine what is required to manage the relationships with those channel members. For example, the company must develop special pricing for online purchases, which will not cut into the pricing for existing channels.

Lotus is also looking at all entities of the actual product. Normally, software is shipped to a customer on four diskettes, but now users can simply download the software online.

d. Information Sources

The Lotus Web site also provides press releases, communiqués and white papers, a catalog of business partners products and services, an international information kiosk, and links to the Italy Partners Information Network (PIN) site and FTP archive at the cc:Mail headquarters.

Lastly, users can access speeches given by executives at Lotus and The Lotus Enterprise Review, a monthly publication that delivers information about groupware, team computing, and the Lotus strategy to CIOs and business managers.

4. Web Site Development and Management

Lotus developed most of its Web site internally, with the exception of the Catalogue application. The aim is to originate all content in Notes. Lotus believes a brochure or specification should be written only once in order for it to be available from any platform, whether that be the Web, an online service, such as WorldCom, CompuServe, AOL, Prodigy, Microsoft Network, or AT&T Network Notes.

Every product manager is provided with a Fulfillment Kit which includes Notes users forms and guidelines for creating content. The kits assure that everyone conforms to a certain set of standards and guidelines, of which which Notes is a competent enforcer. The structure of the incoming content can be managed without the need to communicate with the content's creator.

Setting up the infrastructure to develop and support the Web site was relatively painless, since the developers were already using building content into a Notes database. Once content has been input into a Notes database, the InterNotes product translates the information into HTML.

Lotus' goal is to weave Web development into its business structure. When it decide to integrate the sales function into the Web site, it did not want to hire outside employees for order processing and manufacturing. It wants to be able to use existing order processing and manufacturing components of Lotus to provide content for the Web site.

Lotus has also released tools that programatically create Notes databases from other files such as plain ASCII or AmiPro. The user can create the Notes database programatically and from there create the HTML, also programatically.

The Lotus Web development team is organized as follows:

- **Webmaster/Notes Developer**—focuses on the home page and makes sure all links work.
- **Managing Editor**—provides the long-term vision of the site. This includes working with internal and external partners.
- **Information Architect**—organizes the structure of the Web. The Web site will start out with product information, but will link to a variety of locations. Experience has shown that links increase exponentially, so this person determines the best way to provide a navigation path based on this content. This person builds and manages the maps of the content and is familiar with all components at any given moment. This person determines where new content is going to get plugged in and all the links that are going to be created.
- **Program Development**—a group of people skilled in both Notes and HTML. It builds particulars such as the Lotus Electronic Store and Product Launches. This group determined what the electronic version of the Comdex show products would like. The group translates Lotus' value chain and determines how it will look on the Internet or any other online platform.
- **Design**—determines what looks good on-screen and how it works. The corporate design team might want a certain banner and home page look and will provide the graphical images. But the design team will determine where the buttons go and what they look like. Not only do group members understand design, but they also understand online graphics and how information looks. The Design team works closely with the information architects.

5. Web Promotion

Lotus is still experimenting with online advertising of its Web site. The company initiated a couple of pilot studies by sponsoring other Web sites, but spent the funds with the sole intention of obtaining certain information in return.

The company wants to determine if it is receiving any return on investment, such as lead generation. Eventually, the results will be plugged in with other modes of advertising to receive an 'apples-with-apples' comparison with other forms of advertising. Lotus advertises its Web site on every brochure and print advertisement.

6. Measurement

Lotus currently measures its Web site traffic by analyzing the Netscape server log files. The company tracks where people come from, what pages they visit, how long they stay, and where they go after leaving the site. Lotus also has software to track and extract traffic data and store results in a Notes database. The program will integrate with other Web tools and will be offered as a commercial product.

7. Lessons Learned

Lotus offers a few lessons it has learned from its Web site.

- When a company thinks it has invested enough, it probably needs to invest more.
- Do not underestimate how unforgiving the public site can be. As a software company, Lotus is used to beta testing products. But when a Web site goes up, users are not always as forgiving as they are with beta software. In the early days, Lotus felt it was established before it was ready. When it took the 'under construction' sign down, because it looked better, people could not find content and so assumed the site was disorganized. In reality, the content that they were looking for was not even there because the Web site was in fact still under construction. Lotus decided to put the 'under construction' sign back up on the site.
- Obtain top management's full commitment to the Web strategy. Without support from above, promoting the project internally will be difficult. Most organizations are entrenched and inside managers have multiple jobs to perform. Many times, managers will be satisfied with the platforms they are already using and must be convinced that the Web is the way to go.
- The job is never done. No matter how fast a company tries to develop an application, someone else has already done it.

MCA/Universal (www.mca.com)

1. Introduction

Users can sample the latest products and entertainment from the MCA/Universal family of companies at the MCA/Universal CYBERWALK. Content includes entertainment, purchasing capabilities, and general interest information.

2. History

April 1994, MCA/Universal wanted to go online and began talks with America Online (AOL). However, due to scheduling and exclusivity issues, the project fell through. At that time, AOL was growing very quickly, and could not dedicate the resources or the attention MCA demanded. If something was put up online and one of the artists did not approve of it, AOL would have to change the content immediately. AOL could not provide that kind of rapid response. Additionally, AOL wanted exclusivity on the Jurassic Park video that Universal Pictures was planning to release in November. MCA/Universal refused—its policy was not to grant exclusive rights on any of its content.

Based on its experience with AOL, MCA/Universal decided to develop its own Web site. The company liked the idea of its own site where it could control, monitor and maintain the content internally.

MCA borrowed the necessary equipment and purchased a T1 line. Help was sought from Digital Planet for solving minor technical problems. Digital Planet played a leading role in pioneering interactive products for the entertainment industry, including the first interactive marketing kit for the motion picture, "Sneakers", and the first online site created for prime-time television, the Encounters Forum.

The first Web site developed was for MCA's Winterland Division, featuring an online store offering entertainment-related clothing.

3. Goals

MCA began development by placing all but one of its divisions' content under one umbrella, called the MCA/Universal CYBERWALK. MCA was one of the first media companies to consolidate its content in this way, believing this would make managing the content easier. The one exception was GRB Records, who developed its own Web site.

MCA/Universal Information Services (M/UIS) is responsible for all information processing, networking, technology, and telecommunications for MCA and all its subsidiaries worldwide. In addition it is responsible for developing and managing the CYBERWALK Web site. The group has not established any qualitative or quantitative goals because it does not know what to expect. Occasionally, the MCA divisions that place content on the Web site will ask for an return on investment figure, but M/UIS advises that the only ROI at this time is public recognition.

The general belief at MCA is that its Web site will eventually become one or more of the hypothetical 500 Superhighway Channels of the future. Today, television shows are broadcast at specific times. In the future, after telecommunications technology improves and bandwidth increases, content will simply be placed on a server, from which viewers will be able to download programmes on demand. According to MCA, the Web is just a footprint of the future of interactive television.

4. Results

Originally, MCA did not know how Internet users would react, but the response has been encouraging—the MCA/Universal CYBERWALK site receives over 120,000 hits per day. The company is in the process of establishing a second T1 line to satisfy demand.

To date, MCA/Universal has not obtained any revenues from the CYBERWALK site. Although the company could easily place advertisement banners on the Web site and recoup costs, the company refuses to advertise and will use the site only to promote its divisions' content. The company believes making money from the Web site would create a significant royalty accounting problem. As artists are entitled to royalties for any money made from their work, MCA would encounter great difficulties determining what content contributed to what revenue generated on the Web site. The company is even constrained by how long it can use content on the site. For example, when a movie is released it can be advertised on the Web only while the movie is showing in cinemas. If the company goes beyond that, it is not considered advertising. On the music side, MCA cannot offer samples of tracks in excess of 30 seconds; anything over that is construed as non-advertising.

5. Applications

MCA/Universal CYBERWALK primarily provides users with samples of the latest products and entertainment from the MCA/Universal family of companies. The Web site contains the following sections for users to visit:

a. Winterland Productions

Winterland Productions sells activewear screen printing for t-shirts. On the Web site users can order t-shirts online, find out more about Winterland, enter a trivia contest, and feed back comments to Winterland.

b. Universal Channel

The Television Division's Web site provides a schedule for some of the most popular television shows from Universal. The site provides information on upcoming episodes and information on the development of episodes.

c. Universal V/IP

The Universal V/IP site provides exclusive visual, interactive previews of new Universal releases. Users can interact with their favorite stars and filmmakers, explore virtual worlds online, and take a look behind the scenes. When the movie "Junior" opened, Universal photographers covered the premiere event. The images were digitized and placed on the Web site for viewers to access.

d. AMP

AMP is the music magazine from MCA Records Online, featuring breaking stories on new artists and groups, album notes, tour information and archives. Two or three artists are featured each month on the Web site, including biographies, video clips, and audio samples.

MCA may never sell current CDs online, due to channel conflict. However, MCA Records' catalogue is distributed to customers direct through the post, allowing MCA to provide this content on its Web site. Users can download up to 20 seconds of tracks to preview and can order records online.

e. Universal Studios Hollywood

The Tours Division went live on the Web with a section on the movie 'Back to the Future: the Ride'. The site has been very successful, receiving a large number of hits. In this section, Universal Studios is promoted as theme park and production studio where customers can take part in live interactive events.

f. Spencer Gifts

The Spencer Gift online shopping mall was introduced on the MCA/Universal CYBERWALK. Users can select one of three 'personal shoppers' to guide them through the site or can indicate their preferences and have a gift suggested based on those preferences.

g. MCA Home Entertainment

New releases on video are listed on the MCA Home Entertainment site along with reviews, prices and interactive activities which place the user into the setting of the movie as one of the characters.

6. Future Plans

MCA's future plans include bringing another subsidiary, Putnam Publishing, online to market and sell books. MCA's human resources department is planning to list job opportunities on the Web site. Information Services is working again with MCA Records to put its record catalogue online.

The company also plans to experiment with a subscription service. With a paid subscription, the user will receive a CD-ROM containing the full graphics. When users enter the Web site, they can obtain keys that will unlock certain parts of the CD-ROM. As the graphics will be stored on the CD-ROM, users won't have to wait for them to be downloaded over the Internet. As MCA manufactures its own CD-ROMs, this will be a minimal cost to them.

In addition to Web activity, the company has a number of convergence-related projects underway. One includes digitizing MCA/Universal content and distributing it over cable television networks, using its own cable network.

7. Web Site Development and Management

MCA outsourced work to Digital Planet to create its first Web site, the Winterland online store. Now, MCA uses employees from all five groups within M/UIS to manage the content on the CYBERWALK site. The company estimates that 2-3 employees might assist with the Web site development and management at any one time. For example, the Network Services employees are responsible for the physical support of the Web site, the Interactive Services group liaises with users, imports the content to the Web site and prepares it for production. Those supplying the actual content come from the different divisions within MCA.

Divisions are free to contract out Web development to an outside agency, following standards and rules established by M/UIS. In addition to Digital Planet, other agencies are employed by MCA to develop content for the Web site.

Digital Planet is currently developing movie trailers for Universal Pictures, and other Web content for Spencer Gifts, Putnam Books and Tours. The advantage of the Internet is that the incremental cost for the Web content is small compared with all of the promotional budget that the company might have for a movie or a television episode. A movie might need a \$20 million

budget for promotion, but a good movie-related Web site might cost only \$20,000 to create. On larger movie releases, a full-time person is devoted to developing related Web content. Most divisions of MCA are convinced that Web content is not a major incremental cost.

8. Web Promotion

MCA has promoted its Web site on several newsgroups on the Internet, receiving early assistance from Digital Planet. However, most of the Web site promotion has been by word of mouth. The M/UIS group has identified this type of word of mouth promotion happening by analyzing the Web site's log reports. A person will visit the site from a particular corporation or educational institution. Within the next few minutes, three or four more people will come in, and within a couple of days, hundreds of people from the same site may visit.

MCA is currently negotiating with AOL, Prodigy and CompuServe to put an MCA/Universal icon on their services. However, the company is very cautious about how it utilizes content. If MCA puts content on AOL and makes money, it will potentially owe royalties to the artists, producers and guild. This is the reason MCA/Universal avoided online services from the beginning.

9. Measurement

With Web advertising becoming a financial reality, the need to track its effectiveness is emerging as an issue. Digital Planet's NetCount product is an audited Web rating system that provides precise traffic information broken down by site, subject, page, day and hour. MCA has been using early versions of NetCount, and can tell how many people are visiting the Web site, how many went to each corporate division, and how many hits each division's page received.

MCA's next step is to obtain demographic information. It intends to store demographic information into a database to determine who might be interested in particular upcoming products. Currently, users are asked at the home page to sign the MCA/Universal guest book. However, the company has found that users don't like to spend a lot of time filling in forms. Users may also be put off signing guest books if they suspect they may receive subsequent unsolicited E-mail. MCA plans to develop contests and giveaways to entice more users to provide demographic information.

10. Lessons Learned

If MCA had to start over again with its Web development, it would have done a few things differently.

First, it would have brought in more in-house expertise before embarking on the project. For the first few months, the company relied entirely on Digital Planet, and at times did not get the response that it wanted. MCA recommends hiring experts in both UNIX and HTML to develop and manage the Web site. Currently, the company is hiring more people for internal support of the Web.

Second, MCA would not have underestimated the public reaction to the site. For example, the company created an online game related to one of its programs. The average hit per user was approximately 18. Users were therefore staying on the Web site for a long time. With this kind of access, the company's server was strained, and had to be upgraded several times.

J

San Jose Mercury News (www.sjmercury.com)

1. Introduction

The Mercury Center Web was the first complete daily newspaper to be published on the Web. The service includes continually updated news coverage, the complete text of each day's final edition of the San Jose Mercury News, classified advertisements and a variety of special features. Mercury Center announced its Web site on January 18, 1995.

2. Goals

San Jose Mercury Center uses the Internet to provide electronic information services to Mercury News readers, to generate additional revenue from Mercury News content, and to communicate better with readers.

The company's ultimate goal is to make the Mercury Center Web site profitable. It feels it is on the right track to make money from the Internet.

3. Results

The Mercury Center receives about 20,000 visits per day, which exceeds all goals. In terms of making money, the company is very satisfied with the results so far. The Mercury Center is not yet profitable, but is not far away from the plan.

4. Applications

From the home page, users can choose Directory, Main Menu, What's New, FAQs, Cyberspace Safety, Money Tree, Clippings, and sports-related headlines. Most of the Mercury Center Web is sponsored, with advertisers' graphics inserted into most pages, linking to the advertisers' own sites.

Users can access for free all of the headlines and summaries, including the searchable employment classified advertisement section, in addition to feature articles from the archives.

Other information is available on a subscription basis. Paying subscribers can access the full text of news stories and other areas of the site. A subscription costs \$4.95 per month with a discount for existing San Jose Mercury News newspaper subscribers. Subscriptions are accepted from outside the U.S.

a. NewsHound

The Mercury Center includes a personalized news service, NewsHound. The system compiles all news stories on topics of interest to the subscriber, inserts advertisements, and E-mails the resultant files hourly. Users create profiles by filling out a simple text form with words and phrases that might appear in relevant stories. NewsHound uses the TOPIC search engine from Verity, with additional software written by Mercury Center and Verity.

5. Future Plans

The company plans to include a 10-year archive of the Mercury News, supplemental articles not printed in the Mercury News, a sophisticated search interface for the archive, FTP access to special files and documents, and a Mercury Center-related newsgroup.

6. Web Site Development and Management

Mercury News developed its Web site internally. The only items purchased externally were the Netscape Netsite server, as well as the hardware.

San Jose Mercury News employs about 18 people to support its online activities, which include AOL as well as the Web. Mercury Center Web graphics are created by two employees of the San Jose Mercury News staff. NewsHound software was written by Mercury Center's Technical Development Manager in conjunction with Verity.

7. Web Promotion

The company primarily promotes its products and services directly to customers and expects to continue to do so for the next five years. Other

promotion channels include online services and E-mail. In the next two years, the company believes online services and the Web will increase in importance.

Mercury feels it is too early to predict the profit potential of the Internet.

8. Lessons Learned

The company puts forward two simple lessons it has learnt during its Web project: it would have liked to capitalize on the Web sooner, and would have preferred to build in more interactivity.

K

Saturn Corporation (www.saturncars.com)

1. Introduction

Saturn is a manufacturer and supplier of high-end cars to the U.S. market. Saturn's Web site includes marketing material, technical information, a company magazine and a search facility to locate the nearest Saturn retailer (U.S., Canada and Taiwan only).

2. Goals

Saturn's primary reasons for conducting business on the Internet are to target potential customers demographically and to highlight its image. It feels people using the Internet—typically educated and affluent—are more interested in Saturn cars than other makes and models. The company's own research has found that a large percentage of people who buy Saturn cars own PCs and have some form of Internet access. Therefore, the Internet represents an excellent pool of potential customers.

In addition, Saturn views the Internet as a very valuable tool to educate the public about the company and how it conducts business. Saturn has always tried to position itself as different and innovative. By creating a Web site, the company believes browsers will notice the company's presence and continue to view the company as different and innovative.

The ultimate goal is to motivate prospective customers to request additional information or to physically visit a Saturn site. Saturn feels the Web site should be convenient and allow customers to determine the level of information they want. They feel that much more information can be supplied on a Web page than in a television or print advertisement and at a fraction of the cost.

Saturn also has a presence on Prodigy and uses this to develop relationships with their existing customers and even prospective clients. Within Prodigy, the bulletin board is used as a vehicle that continues to generate relationships with car owners, not just of Saturn cars. This translates into sales, a higher level of brand loyalty and customer enthusiasm.

3. Results

Saturn has already realized benefits using the Internet and online services. Its Web site receives about 1,000 hits per day, and online requests account for about 25% of all requests for additional company and product information. Saturn believes that its Web site provides it with an excellent return on investment.

4. Applications

The Saturn Web site contains information about the current line of cars, with graphics, prices, feature details, and product specifications. If users require more information about the company or its cars, a toll-free telephone number is available.

The Saturn Magazine offers news, background information and other interesting information about Saturn. It contains Word of Mouth, a sampling of letters to Saturn, Saturn the Rails-to-Trails Conservancy, and information on the Saturn cycling team. The Saturn Magazine will include information about the Saturn homecoming that took place last summer, a timeline showing how its cars are made and a review of the company's history.

Users can locate their nearest Saturn dealer by clicking on an imagemap of the U.S. or by typing in their zip code or state abbreviation. They can also order a brochure by supplying their address.

The company intends to add interactive features to the Web site. One possibility includes allowing customers to view particular models in the color of their choice.

5. Prodigy

The same information is supplied on the Prodigy and Web sites. The company's Prodigy presence includes a Saturn bulletin board in which Saturn car owners can discuss topics of interest with each other and with Saturn employees. Saturn's president will at times communicate on the Prodigy bulletin board to gain first hand knowledge of customer concerns.

6. Web Site Development and Management

Saturn outsources most of its promotion work to Hal Riney & Partners, to communicate through one, consistent medium, whether via print, television or the Internet. Hal Riney develops and manages the Web site, but contracts out most of the Web development to Organic Online, an online presence conception, development and implementation company.

7. Web Promotion

Saturn is not actively promoted on the Web and most users find out about it through word of mouth. Several Internet magazines, such as Vibe and HotWired, have established links to Saturn's site, but Saturn does not pay for these links. In the future, the company does not anticipate any large shift in funds from traditional forms of promotion to the Web. The company will decide whether to use the Web for advertising based on results it is currently collecting.

8. Lessons Learned

Saturn is pleased with the results, but believes it can always learn more. It is gaining valuable experience with its presence on Prodigy that is helping with its Web development. Through customer feedback and other research, Saturn will enhance its Web presence on an ongoing basis.

L Schlumberger Ltd. (www.slb.com)

1. Introduction

Schlumberger is a worldwide company in the oilfield services and measurement and systems industries, with operations in over 100 countries. It has 48,000 employees and revenues of around \$6.5 billion. The Schlumberger Web site provides information on the company's divisions, products and services, career opportunities, and shareholder news.

2. History

Four years ago, Schlumberger made the decision to base its own global communications network on the Internet. The company did not foresee the explosion in Internet use for business, and it relishes its role at the time of pioneer. Schlumberger decided to use the Internet to improve efficiency and save costs. With permanent operations in 35 countries and employees in remote areas of 50 other countries, it needed a network that could provide dial-up access from any location. Today, Schlumberger employees can receive

E-mail and check the status of research projects on the Web from any location in the world.

3. Goals

Schlumberger's primary goal is to allow its vendors and clients to learn more about the company. The goal is not necessarily to sell products, but to effectively serve existing customers. Schlumberger has learned that it is much easier to keep an existing client than to obtain a new one and has found the Web to be an excellent tool to provide the necessary support in this respect.

Schlumberger's objective for 1995 was to determine if its Web site was a success. The process of quantitative measurement is difficult, but long term, it hopes it can keep more customers by providing timely information.

The goal for the Web site's look is to keep the home page simple. Using minimal graphics, information gathering is simplified and speeded, and navigation is streamlined.

4. Results

The Web server currently receives about 3,500 hits per day and that number is rapidly increasing. E-mail feedback from users has been positive and the company believes users are satisfied.

Internally, use of the Internet has been extremely successful. A recent Schlumberger study found that the company's overall communications costs have dropped by 2% since the conversion from its old X.25 network to an Internet-based system, even though Schlumberger has increased spending by 20% annually on the network and its IT infrastructure. The savings have come from a dramatic drop in voice traffic and the reduced need for expensive overnight courier services. Today, instead of telephoning or express mailing packages, Schlumberger employees simply attach documents to E-mail messages or navigate through internal Web pages.

5. Applications

Schlumberger uses the Internet as its internal network running at speeds of 9.6 Kbps to 1.544 Mbps. It includes 20,000 Internet E-mail addresses, 20 internal Web servers (plus one external server), and 30 gopher servers. For security, all internal communications are protected by a firewall. The company feels the Internet security risk is minuscule compared with the problem of computer viruses carried on diskettes.

The internal Web servers are used to disseminate information throughout the company worldwide. The servers contain corporate policies, internal

directories, shared software and programs, and location information such as city maps and accommodation details.

When the company needs to communicate a major announcement to its employees, a message is placed on the internal home page employees are E-mailed with a pointer to the information. This form of communication is rapidly growing within the company.

Schlumberger has also started using its Web site as a vehicle for posting information outside the company. This practice promises cost savings. Schlumberger has already stopped printing its quarterly shareholders' reports on paper and supplies them on its Web site.

The Web site provides information on products and services in the company's two groups: Oilfield Services and Measurement & Systems. In the Oilfield Services section of the Web site, users can find out about wireline and testing, Geco-Prakl, Sedco Forex, Anadrill and GeoQuest. The Measurement & Systems section provides information on electricity, water and gas management, electronic transactions and automatic test equipment.

Recruitment services are also on the Web site. Recruiting information online is attracting recent graduates to the company in record numbers. In addition, a public directory of Schlumberger employees can be accessed by outside users. Employees can choose to include their E-mail addresses and other information in the public directory. The database visible to the outside world is getting larger as more employees choose to add their names to the directory.

Schlumberger's Web site also features a three-minute QuickTime video of Ian Strecker, Schlumberger's executive vice president of Technology and Communications, giving a speech titled "Harnessing Technology To Manage Change".

For the future, Schlumberger plans to use the Web to post technical information about its products. The company has eleven business groups and wants to pick a marketing person from each group to take care of the Web content for that group. The goal is to develop a Web site that provides users with information on every company product in every business division.

Schlumberger would also like to add realtime capabilities to its server. For example, the company owns numerous ships in the North Sea and wants to implement a tracking system whereby users clicking on a ship's icon can get location information about that ship. Schlumberger would like to allow employees to receive depth readings of where a drill bit is currently positioned by clicking on oil wells located throughout the world. Lastly, they plan to offer a worldwide office locator feature based on a clickable imagemap.

6. Web Site Development and Management

The Schlumberger Web site was developed internally. The large graphic on the home page is the only part created by an outside source. The company employs one server administrator and one content administrator.

Costs are kept to a minimum—for example, the main Web server cost around \$10,000. At the moment, there is no budget dedicated to running the Web site.

Managing the Web site has been a challenge. The company did not expect such phenomenal growth in such a short period of time. The two employees running the site receive a lot of requests from employees asking for assistance. The few employees contributing to the Web site's content manage their Web projects in addition to their normal duties.

Looking to the future, Schlumberger plans to recruit an employee to work full-time on the Web, making sure all the links work correctly, all of the content gets converted to the HTML correctly, and answering all of the messages received each day.

7. Web Promotion

Schlumberger's Web site promotion has been minimal and relies on word of mouth. In addition, one employee has posted articles on a number of newsgroups. There are, however, no current plans to pay for Web site advertising.

8. Measurement

The company has not established any quantitative goals, but does keep track of user traffic. It feels users are getting what they need, based on the positive nature of feedback.

M**Southwest Airlines (www.iflyswa.com)**

1. Goals

The U.S. internal airline Southwest is using the Web to promote the company's 'personality', which it believes is unique in the airline industry. As competition is intense, much of the company's advertising has been limited to short-term ticket sales, and so advertising emphasis is on price competitiveness. Because of advertising costs, Southwest is not able to put across its whole message through television advertisements. The Web site offers an advertising alternative for much lower cost.

Southwest believes that interactivity is the key to successful advertising. While the company would like users to go straight to the fares and schedules section and immediately purchase a ticket on the Web site, it doesn't want to "beat the users over the head" when they enter the Web site. It wants users to be able to take their time and look at what interests them, instead of only what Southwest wants them to look at.

2. Results

The Web site receives 20,000 to 25,000 hits per day. The company uses a Web statistics program which provides a full summary of hits, breakdown of domains, specific files being hit, and number of hits per day. This tracking program gives Southwest an accurate account of user location and user navigation within the Web site.

3. Applications

The Southwest Web site offers browsers travel-related information in addition to Southwest-specific information. To obtain flight information, users can choose destination and departure cities schedules including flight numbers, departures, arrivals, and fares for each flight. Although users cannot purchase tickets over the Internet, phone numbers to purchase tickets are provided.

Users can access information from Southwest's financial department including financial reports, Herb Kelleher's letter to shareholders, annual reports and SEC filings.

The Airport Information section provides information about the 46 airports Southwest serves, including gate information, directions to the airport, as well as links to other pages that provide details about Southwest cities.

The Web server provides users with profiles of young travelers. This information includes Southwest Airlines Frequent Flyer Program, whether they are traveling with an adult or alone, the, Southwest's check-in recommendations and open seating policy, boarding/check-in procedures, carry-ons, Southwest Airlines Cargo service, AT&T wireless air-to-ground telephone service, Fun Pack vacations, group travel, and lost ticket policies.

Advertising Gallery provides users with a look at past and present Southwest Airlines advertising. The aircraft section includes detailed Fun Facts, such as Boeing 737 Technical Specifications, and a photo library of Southwest Airlines fleet.

Users can download an airline Contract of Carriage and also learn about the Wright Amendment regarding flights to and from the Dallas Love Field.

The Web site provides information on employment opportunities with Southwest Airlines and Southwest employees of the month.

4. Future Plans

Ultimately, the company plans to make the Web site a revenue generator. It is currently building up its Internet presence and establishing itself as a member of the Internet community.

In the future, the Web site will tie into the reservation system. Southwest believes reservations are passé and that the goal is transactions. The user will be able to select a flight and pay for it, and in return will receive a six-digit confirmation code, which will assure the user a reservation is secured and can proceed to the airport on their date of travel.

5. Web Site Development and Management

Southwest has never been known as a leading edge technology company, but it has a good vision and desire to make it happen. The company produced the Web site in-house, through the efforts of seven employees who learned the technology on their own.

The company has an open culture and it chose the more personable and well-liked employees to work on the Web project. It took a lot of hard work to convince skeptics that the Web site was worth the effort. They have found that asking employees to contribute was difficult at times because they had to support it in addition to other responsibilities.

Southwest values its Web site and will make enhancements to it on a regular basis to keep the site innovative. A marquee above the Web gate specifies new activity on the server and new versions that will change the entire home page. Two or three upgrades will occur between each major revision.

The group of seven consists of three staff from marketing and four from systems, who have all been stretched to their limits. They have considered developing some formal controls for prioritizing next steps, but the company does not want to overwhelm itself.

6. Web Promotion

Southwest has developed some plans to promote the Web site and the URL appears on all print advertising.

The company strategically selected the same name for its Internet domain (iflyswa.com) as its toll-free number in the U.S. (1-800-i-fly-swa), itself reflecting the company's corporate slogan, the aim being to establish brand consistency.

The company refuses to pay for online promotion. It does not pay for any links from other companies' sites. For each of the cities Southwest serves, the Web site provides links to other information resources about that city.

Future promotion plans include billboard advertising which will include Southwest's URL.

7. Measurement

The company has not established any measurement standards but has received positive feedback from customers and the press. Southwest does not find it necessary to report Web usage statistics.

8. Perceptions

Southwest agrees that the separation between supplier and distributor will be painful, but less so for itself because it distributes fewer tickets through travel agents, being a short haul, high frequency, low fare carrier. According to Southwest, this separation will occur regardless of how painful it will be. It feels travel agencies will be required to provide some sort of value to the customer and that the distribution chain is too top-heavy today. In the future, customers will expect to be able to effect transactions by themselves, online. Southwest also feels that its type of product lends itself well to direct billing.

N**Yahoo (www.yahoo.com)**

1. Introduction

Yahoo is a massive database containing over 40,000 entries, each linked directly to the relevant Web site. The site fills the most crucial need on the Internet: how to locate and access information efficiently. Although many other guides exist, none is as comprehensive as Yahoo. In response to the growing number of lists of lists on the Internet, the name Yahoo officially stands for "Yet Another Hierarchical Official Oracle". While Yahoo is an index, not an unstructured search engine, it does contain a facility to search the indices.

2. History

David Filo and Jerry Yang, two Stanford University Ph.D. students, originally compiled a small list of sites and placed the list on the Web, when the Web was still young. Then they developed a way for people to send them information on other sites. As a result, they received 300 to 400 requests daily for new listings, which were classified by subject and affixed with a brief description.

Since the beginning, the site has grown dramatically, doubling monthly in size. In April 1995, Filo and Yang decided to turn their efforts into a business and received an estimated \$1 million from venture capital firm Sequoia Capital to continue Yahoo's development for at least a year. The company is expected to make an initial public offering in 1996.

3. Goals

Yahoo's primary goal is speed. The site used to have graphics, but the large graphics have been removed because they slowed down each transaction unnecessarily. Graphics will return to Yahoo, to provide a 'better' look and feel, but not until it determines how to maintain high performance. Yahoo feels there is a segment of the Internet population that uses the Web primarily as entertainment and would enjoy the relaxing kind of experience that graphics provide.

4. Results

Yahoo features sponsors, which appear as embedded graphics with links to the advertisers' sites. The most recently published Yahoo figures quoted \$20,000 a month for each of the 46 prime advertising slots. Since August 1995, the company has collected more than \$1 million from advertisers.

The Yahoo Web site receives visits from approximately 800,000 people per day. Yahoo takes pride in the number of users that access the directory and realize that heavy traffic is important in attracting advertisers.

It believes advertising on the Internet is inevitable and that this will be Yahoo's primary source of income. Given this, Yahoo is trying to determine how to place advertisements so that they are accepted by the Internet community, not an easy task. The company plans to offer advertisers some interesting and innovative promotional avenues.

5. Applications

The What's Cool, What's New and What's Popular sections are among the most frequented areas on the Yahoo site. The top-level categories are: art, business, computers, economy, education, entertainment, environment and nature, events, government, health, humanities, law, news, politics, reference, regional information, science, social science, and society and culture.

The number of entries in each category is listed next to the category link and categories which contain new entries are highlighted.

In good spirit, Yahoo lists other general Internet directories, i.e. competitors, including WWW Virtual Library, EINet Galaxy, and the GNN Whole Internet Catalog. Yahoo also thanks Netscape Communications for hardware and network resources at the bottom of the home page and provides a link to Netscape's home page.

The business section categories are: business schools, classifieds, consortia, corporations, directories, education, electronic commerce, employment, history, intellectual property, management information systems, marketing, markets and investments, miscellaneous, news, products and services, real estate, small business information, taxes, technology policy, trade, indices, and Usenet.

Yahoo plans to open a Web site with Ziff-Davis Publishing called ZD/Yahoo Computing, which will serve as a computer hardware and software guide. Ziff-Davis will also change the name of the recently-launched quarterly "Internet Life" magazine to "Yahoo Internet Life".

6. Web Site Development and Management

Yahoo has set up its own networks at its headquarters. Currently, there are five employees who update the reference guide on a daily basis, and more employees will be brought in to help update the server each day.

Yahoo has completely automated the process of Web development and management. It developed its own tools to manage the content on the server. A custom database stores all of the Web information such as Web site title, URL, category, sub-category, etc. Most of the custom code is written in Perl. Information on the database is accessed with a proprietary Web browser, based on Mosaic.

Once content has been stored on the database, HTML coding is generated using translation tools and is then verified for bad links, using proprietary Web management software.

For the future, the company is developing sophisticated technology to make the Yahoo directory service even better. Yahoo plans to introduce new and improved content on the server by extracting information out of the database and presenting it in several different ways. It feels it is extremely difficult for others, who do not have its database, to mimic the directory and service. Yahoo realizes that its tools are advanced and can probably be marketed to other companies, but plans to keep them in-house for the time being to sustain its competitive advantage.

Yahoo considered developing an automated entry system, like that of competitor Open Market, but felt that it does not assure the quality and consistency of the directory. At Yahoo, employees personally control where items are placed on the Web site. By allowing outsiders to submit entries, Web sites might get placed in the wrong categories, which is difficult to control. For example, an Internet directory, known as Da Claw, once allowed users to create their own directories and add their own Web pages. Chaos ensued because users wanted to appear at the top of every list and they wanted to create their own categories. Eventually, the directory failed. Learning from this lesson, Yahoo strives to keep control of the directory and maintain the hierarchical consistency. It is this human control over the indices that sets Yahoo apart from indiscriminate directories and from far-reaching but unstructured search engines.

In the future, Yahoo might allow certain companies, such as large publishers, set their own links. However, only those companies that are extremely familiar with the hierarchy will be granted access. Yahoo will also seek the assistance of an outside agency when it reintroduces graphics to the site.

7. Web Promotion

Yahoo has promoted its Web site mainly through word of mouth but it also receives a considerable amount of attention in the press. So many articles about the Internet in magazines and newspapers mention Yahoo that the company does not need to market itself aggressively.

Interactive Marketing (IMI), an interactive marketing agency, is the marketing agency of record for Yahoo. IMI is also working with Yahoo to run promotions and is responsible for advertising sales. Neihaus Ryan Haller (NRH), a public relations firm, is providing PR services to Yahoo.

Yahoo tracks the numbers of visitors carefully; measurement is instrumental to its advertising strategy. The company outsources to I/PRO to deliver an independent report of Yahoo's usage to its sponsors.

8. Perceptions

a. Alternative Medium

Yahoo believes the tools it takes to use the Internet and the bandwidth available will increase over time. As bandwidth is upgraded, content will improve and multimedia, voice and video will be included. Eventually the Internet will parallel what printed media and television do today.

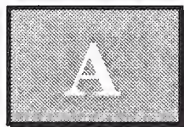
b. Information Before Commerce

There has been a great deal of talk about buying on the Internet, but Yahoo feels that the commerce is not as solidified as finding news or information about a company or topic. Many companies are trying to take care of the security problem which exists for electronic commerce, but this will take some time.

d. Interactive Information

Yahoo believes that the Web as an information resource is here to stay and will continue to grow. It sees the Web as remaining a free service, but with the gradual introduction of paid-for services. Yahoo views the information delivery aspect as the driving force behind the growth of the Internet and feels it delivers information in a different way from any other medium. It is different because of the way it interacts with users, the way it is transmitted to users, how users travel to sites, and everything else in between.

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Glossary

This appendix provides definitions of terminology associated with the Internet that is not in INPUT's *Definition of Terms*.

A

Definitions

56Kbps/64Kbps Line	A digital phone-line connection capable of carrying 57,344 (U.S.) or 65,536 (Europe) bits per second. At this speed, one megabyte will take about 3 minutes to transfer, around four times faster than with a 14.4Kbps modem.
ADN	Advanced Digital Network – usually refers to a 56Kbps leased line.
Archie	A software tool for finding files stored on anonymous FTP sites. You need to know the exact file name or a sub-string of it.
ARPANet	Advanced Research Projects Administration Network, the precursor to the Internet. Developed in the late 1960s and early 1970s by the U.S. Department of Defense as an experiment in wide area networking that would survive a nuclear war.
Audit	The collection of information about security events on a network. Auditing is used for logging events, identifying network attacks, and ensuring that network security is working effectively.
Authentication	Verification of the claimed identity of a computer or computer network user.

Backbone	A high-speed line or series of connections that forms a major pathway within a network. The term is relative as a backbone in a small network may be much smaller than many non-backbone lines in a large network.
Bandwidth	How much information can be sent through a connection. Usually measured in bits per second. A full page of English text in a book totals around 20,000 bits. A fast modem can move about 30,000 bits in one second (30Kbps), rising to around 120,000 bits per second (120Kbps) depending on the type of information being transferred and the compression used. Full-motion, full-screen video would require roughly 10,000,000 bits per second (10Mbps), depending on compression.
Bastion Host	Another term for firewall host.
BBS	Bulletin Board System – a computerized meeting and announcement system that allows people to carry on discussions, upload and download files, and make announcements without the people being connected to the computer at the same time.
Bit	Binary digIT – a single digit number in base 2; in other words, either a one or a zero. The smallest unit of computerized data. Bandwidth is usually measured in bits per second.
Browser	A client program (software) that is used to look at (or browse) various kinds of Internet resources.
Byte	A set of bits that represent a single character. Usually there are 8 or 10 bits in a byte, depending on how the measurement is being made.
Client	A software program that is used to contact and obtain data from a server software program on another computer, often across a great distance. Each client program is designed to work with one or more specific kinds of server programs, and each server requires a specific kind of client.
Cyberspace	Currently used to describe the whole range of information resources available through computer networks such as the Internet.

Domain Name	The unique name that identifies an Internet site. Domain names always have 2 or more parts, separated by dots, for example 'input.com'. The part on the left is the most specific, and the part on the right is the most general. A given machine may have more than one domain name but a given domain name points to only one machine.
DNS	Domain name server - a means by which numeric IP addresses (e.g. 198.93.130.56) are converted into character-based names (e.g. www.input.com) and vice versa.
E1	A leased-line connection capable of carrying data at 2.048Mbps. At maximum theoretical capacity, an E1 line could move a megabyte in less than five seconds. That is still not fast enough for full-screen, full-motion video, for which you need at least 10Mbps. E1 is one of the fastest speeds commonly used to connect networks to the Internet.
E3	A leased-line connection capable of carrying data at 34Mbps. This is more than enough to transmit full-screen, full-motion video.
E-mail	Electronic mail – messages, usually textual, sent from one person to another via computer. E-mail can also be sent automatically to a large number of addresses via a mailing list.
Encryption	A method of protecting data so that if it is accessed, it cannot be understood without the use of a secret encryption key.
Ethernet	A very common method of networking computers in a LAN. Ethernet will handle about 10Mbps and can be used with almost any kind of computer.
FAQ	Frequently Asked Questions – FAQs are documents that list and answer the most common questions on a particular subject. There are thousands of FAQs on subjects as diverse as pet grooming and cryptography. FAQs are usually written by people who have tired of answering the same question many times. FAQs are often associated with Usenet newsgroups.

Fast Ethernet	The latest Ethernet standard that specifies a data transfer rate of 100Mbps, a ten-fold increase over traditional Ethernet performance.
FDDI	Fiber Distributed Data Interface – a standard for transmitting data on optical fiber cables at a rate of approximately 100Mbps.
FTP	File Transfer Protocol – A very common method of moving files between two Internet sites. FTP is a special way to login to another Internet site for the purposes of retrieving and/or sending files.
Finger	An Internet software tool for locating people on other Internet sites. Finger is also sometimes used to give access to non-personal information, but the most common use is to see if a person has an account at a particular Internet site. Many sites do not allow incoming finger requests.
Gateway	A hardware or software configuration that translates between two dissimilar protocols, for example CompuServe has a gateway that translates between its internal, proprietary E-mail format and Internet E-mail format.
Gopher	A widely used method of presenting material available on Internet sites as textual menus. Although gopher spread through the Internet rapidly in only a couple of years, it is being largely supplanted by the World Wide Web (WWW).
Host	Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as Web and Usenet.
HTML	HyperText Markup Language – the coding language used create hypertext documents for use on the World Wide Web.
HTTP	HyperText Transport Protocol – the protocol for moving hypertext files across the Internet. Requires a HTTP client program at one end, and an HTTP server program at the other. HTTP is

the most important protocol used in the World Wide Web today.

Hypertext	Generally, any text that contains "links" to other documents – words or phrases in the document that can be chosen by a reader and which cause another document to be retrieved and displayed.
IP Address	A unique number consisting of 4 numbers separated by dots. Every machine that is on the Internet has a unique IP address – if a machine does not have an IP address, it is not really on the Internet. Most machines also have one or more domain names that are easier for people to remember. For example, the IP address of www.input.com is, at the time of writing, 198.93.130.56.
IRC	Internet Relay Chat – a large multi-user live chat facility. There are a number major IRC servers around the world which are linked to each other. Anyone can create a channel and everything that any member of a channel types in is seen by all users in that channel. Private channels can be created for invitation-only conference calls.
ISDN	Integrated Services Digital Network – a 64Kbps digital telephone line connection. ISDN acceptance is still low due to high equipment prices, but as prices fall individuals and companies are benefiting from leased line performance on a dialup line. Connect time charges are normally the same as for a regular analog telephone connection.
Internet	The vast collection of interconnected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 1960s and early 1970s.
ISP	Internet Service Provider – an organization (usually commercial) that offers individuals and other organizations access to the Internet through a dialup connection, ISDN, or leased line.
Kilobit	1,024 bits. Abbreviated to Kb.
Kilobyte	1,024 bytes. Abbreviated to KB.

LAN	Local Area Network – a computer network limited to the immediate area, usually the same building or floor of a company building.
Leased line	A phone line that is permanently held open for data transfer between two locations. The highest speed data connections require a leased line.
Listserv	The most common kind of mail list, Listservs originated on BITNET but they are now common on the Internet.
Login	The account name used to gain access to a computer system or network.
Megabit	1,024 kilobits. Abbreviated to Mb.
Megabyte	1,024 kilobytes. Abbreviated to MB.
Mail list	An automated system that allows people to send E-mail to one address, whereupon their message is copied and sent to all of the other subscribers to the mail list. In this way, people who have many different kinds of E-mail access can participate in discussions together.
Mosaic	The first WWW browser that was available for the Macintosh, Windows and UNIX through a consistent user interface. Mosaic created the explosion in popularity of the Web. The source code of Mosaic has been licensed by several companies and there are now several other browsers as good as or better than Mosaic, most notably Netscape.
Newsgroups	The name for discussion groups on Usenet.
Node	Any single computer connected to a network.
Packet Switching	The method used to move data around on the Internet. In packet switching, the data coming out of a machine is broken up into chunks, each chunk containing the address of where it came from and where it is going. This enables chunks of data from many different sources to coexist on the same lines, and be sorted and directed to different destinations by special machines along the way.

This way many people can use the same lines at the same time.

Password	A code used to gain access to a locked system. Good passwords contain letters and non-letters and are not simple combinations.
PPP	Point to Point Protocol – most well known as a protocol that allows a computer to use a regular telephone line and a modem to make a TCP/IP connection and thus be on the Internet. PPP is gradually replacing SLIP for this purpose.
Proxy Server (Proxy)	An application that controls traffic between a protected network and the Internet.
RFC	Request For Comments – the name of the result and the process for creating a standard on the Internet. New standards are proposed and published on-line, as an RFC. The Internet Engineering Task Force is a consensus-building body that facilitates discussion establishes new standards.
Router	A software package or special-purpose computer that handles the connection between two or more networks. Routers spend all their time looking at the destination addresses on the packets passing through them and deciding which route to send them on.
Server (see Client)	A computer, or a software package, that provides a specific kind of service to client software running on other computers. A single server machine could have several different server software packages running on it, thus providing many different services to clients on the network.
SLIP	Serial Line Internet Protocol – a standard for using a regular telephone line (a "serial line") and a modem to connect a computer as a real Internet site. SLIP is gradually being replaced by PPP.

T1	A leased-line connection capable of carrying data at 1.544Mbps. At maximum theoretical capacity, a T1 line could move a megabyte in less than 10 seconds. That is still not fast enough for full-screen, full-motion video, for which you need at least 10Mbps. T1 is one of the fastest speeds commonly used to connect networks to the Internet.
T3	A leased-line connection capable of carrying data at 44.736Mbps. This is more than enough to transmit full-screen, full-motion video.
TCP/IP	Transmission Control Protocol/Internet Protocol – a collection of communication protocols that define the Internet and allow different computers to communicate with one another over a common network.
Telnet	The command and program used to log in from one Internet site to another. The telnet command/program gets you to the "login:" prompt of another host.
Terminal	A device that allows you to send commands to a computer somewhere else. At a minimum, this usually means a keyboard and a display screen and some simple circuitry. Usually you will use terminal software in a personal computer; the software emulates a physical terminal and allows you to type commands to a computer somewhere else.
Terminal Server	A special purpose computer that has places to plug in many modems on one side, and a connection to a LAN or host machine on the other side. Thus the terminal server does the work of answering the calls and passes the connections on to the appropriate node. Most terminal servers can provide PPP or SLIP services if connected to the Internet.
Trojan Horse	A program that performs a desired task, but also includes unexpected functions, usually unpleasant, such as random file deletion.

URL	Uniform Resource Locator – the standard method of addressing resources on the World Wide Web, such as Web pages themselves. For example, http://www.input.com/
Usenet	A worldwide system of discussion groups, with comments passed among hundreds of thousands of machines. Only about half of all Usenet machines are on the Internet. Usenet is decentralized, with over 13,000 discussion areas, called newsgroups.
Veronica	Very Easy Rodent Oriented Net-wide Index to Computerized Archives – developed at the University of Nevada, U.S., Veronica is a constantly updated database of the names of almost every menu item on thousands of gopher servers. The Veronica database can be searched from most major gopher menus.
Virus	A segment of code which replicates by attaching copies of itself to existing executables.
WAIS	Wide Area Information Service – a commercial software package that allows the indexing of huge quantities of information, and then making those indexes searchable on the Internet according to keywords.
WAN	Wide Area Network – any network that covers an area larger than a single building or campus.
World Wide Web	The whole constellation of resources that can be accessed using gopher, FTP, HTTP, telnet, Usenet, WAIS and other tools. WWW is the universe of hypertext servers which are the servers that allow text, graphics, sound files, etc. to be combined together.

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B

Corporation Names and Addresses

Names and addresses of *Internet Applications Case Studies*' subjects are listed in Exhibit B-1.

Exhibit B-1

Names and Addresses of Subject Companies

Company
Compaq Computer Corp. 20555 SH 249 PO Box 69-2000 Houston, TX 77269 Tel: (713)370-0670 WWW: http://www.compaq.com
Encyclopedia Britannica, Inc. 310 S. Michigan Ave. Chicago, IL 60604 Tel: (312)347-7000 WWW: http://www.britannica.com
Digital Equipment Corp. 146 Main Street Maynard, MA 01754 Tel: 1-800-DIGITAL (1-800-344-4825) WWW: http://www.digital.com
General Electric Co. 3135 Easton Turnpike Fairfield, CT 06431 Tel: (203)373-2211 WWW: http://www.ge.com

Exhibit B-1 (Cont.)

Company
<p>The Goodyear Tire and Rubber Co. 1144 East Market Street Akron, OH 44316 Tel.: (330)796-2121 WWW: http://www.goodyear.com</p>
<p>Hilton Hotels Corp. 9336 Civic Center Drive Beverly Hills, CA 90210 Tel.: (310)278-4321 WWW: http://www.hilton.com</p>
<p>J.P. Morgan 60 Wall Street New York, NY 10260 Tel.: (212)483-2323 WWW: http://www.jpmorgan.com</p>
<p>Lotus Development Corp. 55 Cambridge Parkway Cambridge, MA 02142 Tel.: (617) 577-8500 WWW: http://www.lotus.com</p>
<p>MCA Inc. 100 Universal City Plaza Universal City, CA 91608 Tel.: (818)777-1000 WWW: http://www.mca.com</p>
<p>Saturn Cars 110 Saturn Parkway Mail Drop S24 Spring Hill, TN 37174 Tel.: 1(800)522-5000 WWW: http://www.saturncars.com</p>
<p>Schlumberger Ltd. 277 Park Ave. New York, NY 10172 Tel.: (212)350-9400 WWW: http://www.slb.com</p>

Exhibit B-1 (Cont.)

Company
San Jose Mercury News 750 Ridder Park Drive San Jose, CA 95190 Tel.: (408)920-5000 WWW: http://www.sjmercury.com
Southwest Airlines Co. 2702 Love Field Drive Box 36611 Dallas, TX 75235 Tel.: (214)904-4000 WWW: http://www.iflyswa.com
Yahoo! Corporation 635 Vaqueros Ave. Sunnyvale, CA 94086 Tel.: (408)328-3300 WWW: http://yahoo.com

