

A Website Design for the Texas Window Initiative



A Field Study Report

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By

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ABSTRACT

A Website Design for the Texas Window Initiative

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The purpose of this field study was to develop and evaluate a website for the Texas Window Initiative. TWI is a non-profit organization whose mission is to provide information and education about the benefits of high performance window technology. These windows are far more energy efficient than regular windows, but relatively few people know about them. The TWI website is to be used as part of an educational campaign to increase the use of these windows. The target population is therefore composed of home builders, window retailers and the home-buying public at large.

A needs assessment was conducted to find out what type of windows-related content TWI staffers and scientists wanted to include. User interface and site architecture issues were also covered. With this information as a guideline, I developed the site over a period of several months. Next, a formative evaluation was conducted to gain feedback for revision to the website. A questionnaire was used as the tool to gather the

impressions of the survey group, which was composed of 6 TWI staff members. Their recommendations and concerns regarding the website were noted, and I then went about making final revisions to the site based on this feedback.

The site went “live” in January 2001, and is viewable at www.texwin.com. According to TWI staff, the site still plays an important role in the organization’s educational and promotional efforts.

I certify that the Abstract is a correct representation of the content of this thesis.

Chair, Thesis Committee

Date

CERTIFICATE OF APPROVAL

I certify that I have supervised the field study, *A Website Design for the Texas Window Initiative*, by Steven D. Hall, and that in my opinion it meets the criteria for approving a culminating study submitted in partial fulfillment of requirements for the Master of Arts Degree at San Francisco State University.

Deborah Curtis, Professor

Eugene Michaels, Professor

Approved by COE Graduate School Committee

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SECTION 1: THE PROJECT

1.1 Purpose

The purpose of this project was to design and develop a website for the *Texas Window Initiative (TWI)*. This site is part of an educational program aimed at window manufacturers, distributors, retailers, building product sales professionals, homebuilders, replacement contractors and the general public. TWI's objective is to inform these parties of the benefits of triple-paned, UV-blocking "high efficiency" windows vs. single-paned traditional "low efficiency" windows. High efficiency windows make homes more comfortable while lowering energy bills, reducing fading of furniture and protecting the environment by lessening energy demand.

The website is just one of several methods that are utilized to get across TWI's message. The other educational and promotional efforts include: on-site professional meetings and trainings; on-site trainings for the sales force at retailers; on-site professional meetings and trainings with home builders; development and distribution of informational brochures; and development and distribution of point-of-purchase displays.

However, since all of the abovementioned methods must be coordinated with the website, it is crucial for the success of the *Texas Window Initiative* that the site be as informative and convincing as possible, in order to elicit the desired change of behavior in the targeted audience.

1.2 Significance

Public energy-use rates across the US are steadily rising. To mitigate this ever-rising rate, the Texas Department of Energy has mandated that 10% of a state utility company's load growth be met through energy efficiency by 2004. The *Texas Window Initiative* was formed and is sponsored by several utility companies in Texas as a way to meet this state requirement. By educating builders, manufacturers, retailer and the public about the technology and benefits of high performance windows, TWI will broaden understanding, resulting in a transformation of the windows market towards high performance, energy efficient windows.

Windows can affect about 25% of a typical home's heating energy and up to 60% of its cooling costs. Partly as a result of previous utility company efforts, many Texas homebuilders are already installing adequate levels of wall and ceiling insulation as well as offering high efficiency air conditioners. Improving window efficiency is one of the most attractive

remaining paths for increased energy savings. Unfortunately, most Texas builders, suppliers and the public at large are unaware of the benefits of high performance windows.

If the TWI can succeed in its mission, it will have played a positive role in slowing the ever-rising energy consumption rate in Texas. At least in this relatively small part of the world, the pollution rates and contribution to global warming associated with energy production will be reduced. As the Internet is a technology with a worldwide reach, perhaps the TWI educational material, if presented well, will contribute to another similar program being introduced somewhere else in the world.

1.3 Background

In the summer of 2000 I was approached by the Texas Window Initiative coordinator to create the organization's first website. As an educator with a strong interest in the environment, as well as web design skills, I was considered to be an ideal candidate for the job. I gladly accepted the offer, because the timing was perfect considering that I was searching for an appropriate topic for my ITEC 895 Field Study.

I was interested in this topic because of my interest and background in environmental conservation. The state of Texas lags far behind California

and other populous regions in terms of environmental awareness and energy-saving programs. In fact, it is generally-known that Texas is the largest per capita consumer of energy of any of the 50 states. I saw the development of the TWI website as an opportunity to put my web designing skills to good use, as well as to educate the public about a subject that is meaningful to me, and I hope to others.

The TWI project, of which the website is a part, is intended to present informative and compelling window performance information to a variety of windows related producers, builders and consumers. Rather than promoting brand names or labels, TWI will provide education that will allow people to make informed choices for energy conservation, dollar savings and increased home comfort.

While high performance products are now available and affordable, and more could be made available upon demand, knowledge among the builders and vendors has been too low to bring about widespread adoption of the new window technology. It should be pointed out that the window products promoted by TWI are not experimental or prototypes. For example, *spectrally selective low emissivity glass* is currently in production from all American flat glass manufacturers.

TWI's challenge, and my challenge as the project's Web Designer, is to convince Texas builders, suppliers and homebuyers to recognize the multiple benefits of high performance windows. I hope this will then lead to a change in their buying behavior toward these types of windows.

1.4 Overview of Instructional Design Process

This site is intended to be utilized by a wide-ranging audience with a desire to learn more about high performance windows. Some will be familiar with window technology and some will not. Therefore, I designed the site to be self-paced and supportive of individual learning. Knowing that many users are not web savvy, I've designed the site to be as simple to navigate as possible, using common web "conventions" such as a left hand navigation bar and a prominent TWI logo which leads to the home page, on every page.

Much of the learning will come from the *All About Windows* section of the site, which presents some fairly complex scientific concepts. This 32-page educational unit includes pop-up windows that can activate if the user wants more information on a particular concept. Also included in this portion of the site far more frequently than in others are *images*. I believe

that graphics help reinforce the complex concepts presented throughout this section far more effectively than words alone.

I've built these instructional design elements into the site because each user is unique in his/her reasons for visiting the site and will have varying levels of knowledge regarding high performance windows. It is crucial that the site is as learner-focused and learner-driven as possible, allowing the users to learn what they want, when they want.

1.5 Target Audience Description

The TWI website was created to provide education and training to windows manufacturers, distributors, retailers, building product sales professionals, homebuilders, replacement contractors, architects and the general public.

This target audience is considered to reside and work in the state of Texas, though the information to be provided within the website is germane to *anyone* seeking education and training about high performance windows. Therefore, due to the all-encompassing nature of the Internet, it is conceivable that the potential audience for the TWI site is all Internet-connected people, *worldwide*, who are interested in learning more about high performance window technology.

1.6 Needs Analysis

As the Web designer assigned the responsibility of getting TWI's first site up and running, I had to listen to and work closely with the scientists and technicians who possessed the window technology content knowledge.

The needs assessment for creating the website, therefore, involved my assessing the wants and requirements of the TWI staff. This group had previously determined what the target audience's needs were in terms of windows education, so I needed to translate their findings to a Web-compatible format. This was not a simple task, considering that most of the TWI group was not web-savvy.

The TWI staff did, however, have some definite ideas about what message and information they wanted to get across to users of the site. The following summary, compiled after extensive meetings, emails and telephone conversions between myself and the rest of the TWI team, outlines the basic needs of the group. I've divided the list into 2 sections: *TWI Content* and *User Interface/Site Architecture*.

TWI Content

1. The site must link to other useful websites which have additional high performance windows information, including *Efficient Windows*

Collaborative, Energy Star, Alliance to Save Energy, Lawrence Berkeley National Laboratory, Florida Solar Energy Center and SECO.

2. Upcoming events sponsored by TWI or of possible interest to website visitors (such as trainings or demonstrations) should be listed on the site.
3. TWI Press Releases should be included on the site.
4. There must be an efficient way for the website users to find the addresses of participating dealers in the user's area that carry and/or build high performance windows products.
5. Specific technical information to be explained on the site must include:
 - Energy efficiency as a selling point
 - Benefits of high performance windows to homeowners
 - Benefits of high performance windows to remodeling contractors and homebuilders
 - Benefits for window retailers
 - Window energy basic concepts (the solar spectrum, conduction, convection and radiation)

- How a window really works – heat gain and heat loss through windows
- Compare windows types – heating, cooling, energy & dollar savings and comfort Measures of window performance and the NFRC rating and labeling system Window features (low E coatings, frames, gas fills, numbers of panes, spacers, and type of glass, fading effects, condensation effects)
- Energy Star window labeling (product availability; product quality, reliability, and warranties)
- What type of windows work best in Texas

User Interface/Site Architecture

1. The site must be easy to use. Many users will not have much experience using the Web and the site must be as trouble free as possible.
2. The site's navigation should be simple, allowing users to be able to return to the home page with one click.

3. The site should have a search function to make finding detailed scientific terminology or locating high performance windows providers as easy as possible.

4. The graphics should be simple and fast loading since many users will be accessing the site from laptops and slower dial-up modems.

5. The color scheme should be vibrant but not interfere with the message. It should have a “Texas” theme, since TWI is a Texas based initiative, and it is commonly known that Texans respond well to “Texas-based” themes. This is important from a marketing/persuasive standpoint.

6. The site should employ “some technology” (CSS) so that as pages are added and/or modified, possibly by another Webmaster at a later date, the original “look and feel” can be easily and consistently maintained.

7. Technical windows information, such as text and graphics to be used in the educational portion of the site, should be taken from other TWI training materials to maintain consistency. This requires “backwards repurposing” from assorted TWI PowerPoint presentations and scanned hardcopy documents.

8. The education portion of the site should include slides which explain the basic technical information in as simple a manner as possible. If readers want more information about a particular slide, a window should “pop up” which would provide the site user with more detailed technical information.
9. The site should be regularly updated with fresh content, to drive page hits.
10. The site should have some way of recording visitors (counter).
11. There should be information on how to contact TWI, by phone, regular mail and email.
12. There should be a form that allows users to send information and feedback, request more information and provide email, so emails can be gathered to be on a mailing list to receive a TWI newsletter (to be implemented at a later date).

SECTION 2: LITERATURE REVIEW

2.1 Introduction

As the Web developer of the TWI site, it was vital that I not only familiarized myself with the available literature on window technology, but also included information and concepts on good Web design practice. I have reviewed a wide range of information (from magazines, books and the Internet) covering both of these major themes.

2.2 Review of Web Design

Though there are a profusion of books about Web design on the market, I found that they are either cutesy and over-simplified for the technophobic, or conversely, giant-sized references. However, there are a few gems that actually transcend the norm and provide quality research. These books include Jacob Nielsen's *Designing Web Usability: The Practice of Simplicity*, Louis Rosenfeld and Peter Morville's *Information Architecture for the World Wide Web*, Philip Greenspun's *Philip and Alex's Guide to Web Publishing* and Edward Tufte's *Visual Explanations: Images and Quantities, Evidence and Narrative*.

For clarity, I have broken this section into components of Web design that I felt were crucial to the success of the TWI website. These design

principles are simplicity, consistency, navigation, content/readability, and speed.

Simplicity

A simple design can minimize the confusion that a user might experience when visiting a website. The term “simplicity” is commonly used when describing good web design, though it is often overlooked in favor of “bells and whistles.” According to Jakob Nielsen, whose influential design book is titled *Designing Web Usability: The Practice of Simplicity*, “Not every Web page needs to bombard the user with the equivalent of Times Square in impressions and movement.” (Nielsen 1999, p.131). In fact Nielsen cites “gratuitous use of bleeding edge technology” as number two of the *Top Ten Mistakes in Web Design* (Nielsen 1996).

To achieve simplicity of design is not easy. It requires a considerable amount of thought and planning. Simple but attractive design elements should be incorporated to enhance clarity and create a sense of order. Unnecessary elements, such as animated images and large graphics, should be eliminated. Open space should be incorporated in the design, while avoiding busy backgrounds and excessive use of colors and uncommon fonts that can detract from readability. User confusion is the

likely outcome of an ill-conceived website which does incorporate simplicity of design. “Good website design begins with a good website plan. But it doesn’t have to be a complicated plan. It can be a simple plan. As a matter of fact, simple is better.” (Williams and Tollet 1998, p.126).

Since creating a website is a labor-intensive activity, requiring a large output of energy, time and money, one would hope for payback in the form of a large amount of users attracted to the site. A designer must understand that “The Web is an attention economy where the ultimate currency is the user’s time. What do they look at, where do they decide to stay, and where are they going to return at a later date?” (Nielsen, 1999, p.160). Keeping the design straightforward and simple should be of paramount importance to the designer, otherwise users will not stay on the site for long.

Consistency

The consistency of the website design is a factor which can aid significantly in the site’s ease of use. It has been said that “An attractive site is distinguished by a cohesive and consistent look that presents a unique identity for the site and, ideally, for its sponsors...Behind such sites stand graphic designers for whom design is about the whole page, not just

the images.” (Rosenfeld and Morville, 1998, p.7). To this end, a common design theme should be used throughout the entire website, and it should be especially prominent in the navigational feature used within the site. But this theme should not be overly complicated or busy. It should be simple and not interfere with the message and easy of use of the site. In other words, “A limited color palette, or color scheme, can be very appealing and can add more of a feeling of sophistication and organization.” (Williams and Tollett 1998, p.157).

Consistency can also be maintained by conforming to standard Web conventions, such as in the use of link colors and location of links on the page. Jakob Nielsen contends that all links should maintain the original “blue” color, and that search field boxes should always appear in the upper right-hand corner of the Web page. These he feels will soon be Web design conventions. (Nielsen 1999). Another (almost) Web convention which aids consistency is the navigation bar: “One of the most popular graphics is the bar or stripe down the left edge, which adds an organizing element to the page.” (Williams and Tollett 1998, p.207)

Navigation

The effectiveness of a website depends greatly on good navigational design to guide the user throughout the site. And it must be intuitive to the user. To continue with the “simplicity is best” theme established earlier, “Clear and simple are still the best ways to make friends and win customers – if you have to explain how to use your navigation system, it’s wrong.” (Williams and Tollet 1998, p.132).

To create an effective navigational system, clear and consistent navigational conventions must be used, such as forward and backward arrows and navigation bars. Graphical navigational aids should be accompanied by alternate text-based ones. For example, graphical buttons should have <ALT> tags which explain in text form what function they perform. In essence, “Navigation interfaces need to help users answer the three fundamental questions of navigation: Where am I?; Where have I been?; Where can I go?” (Nielsen 1999, p.188).

The goal of a website’s navigational system is to ensure that each page can stand alone without the user getting lost. It is therefore essential that frames not be used, dependence on “back button” navigation be avoided and a site map should be included in the site’s architecture. When these Web conventions are ignored, there are problems: “Usability problems

occur...when non-standard linking practices are used (e.g. pull down menus, abandoning the convention of underlining linked text, using non-standard colors). (Nielsen 1999, p.62).

Another important concept in designing effective navigation for websites is to build it with the user in mind, rather than from the perspective of the site's owners. Too many sites take the opposite approach and end up with a site that is ineffective from the user's perspective. "Successful labeling systems mirror the thinking and language of a site's users, not its owners." (Rosenfeld and Morville 1998, p.85).

Content

It would be an understatement to say content is the most important element of web design. The whole point of creating a website is to provide content (information) that your target audience will find useful. As Jacob Nielsen reminds us "Content is the focus of the Web user's attention. It's the reason they go online, and it's the first thing they look at when they load a new page." (Nielsen 1999, p.160).

Now that we've established the importance of having information on a site, it is vitally important that that content is effectively organized. It should be

broken down into logical units, establishing a hierarchy of importance, and using that hierarchy to structure the site. We're all becoming librarians"...as the Internet provides us all with the freedom to publish information, it quietly burdens us with the responsibility to organize that information." (Rosenfeld and Morville 1998, p.23).

Furthermore, most users visit a website in order to find a piece of information they are looking for. And they want to find that content as quickly and as easily as possible. In order to satisfy the user, Web designers should bear in mind the fact that "Users don't like to read...and Web pages should employ scannable text using highlighted keywords, sub-headings, lists, and have only one idea per paragraph." (Nielsen 1997). Although this seems to contradict the typical writing found in books and magazines today, a useful technique for helping website users find the information they seek on a site is for designers to "Use plain language...and start each page with the conclusion." (Nielsen 1999, p.111).

Speed

As studies have consistently shown and as an Internet user knows, slow download times are *a*, if not *the* major annoyance of Web users. After

providing useful content, the number one task for Web designers is to ensure that that content displays rapidly in a browser. Sites must be designed that consider the users with basic, slow modems. “Web pages must be designed with speed in mind. In fact, speed must be the overriding design criterion. To keep page sizes small, graphics should be kept to a minimum, and multimedia effects should be used only when they truly add to a user’s understanding of the information. Occasionally, there are cases where the saying “An image is worth a thousand words’ is so fitting that it overcomes the corollary ‘An image takes two thousand words worth of download time.’” (Nielsen 1999, p.135).

SECTION 3: DESIGN & DEVELOPMENT

3.1 Goals and Objectives

The primary goal for the TWI website was to educate the various players of the building industry and the general home-buying public as to the benefits of high-efficiency windows. After working through the site’s instructional component, users should have an understanding of how and

why these windows are superior to regular-type windows. The users should therefore be persuaded to install high efficiency windows instead, saving themselves money (in the long run), reducing energy demands on the state's utilities and limiting damage to the global environment.

The site's secondary goal is to serve as a resource for finding more information about high-efficiency windows. Users should be able to locate nearby retailers that sell high-efficiency windows products, find out recent developments regarding high-efficiency windows in Texas, ask for more information about windows technology from TWI, and read more about the technical aspects of windows by way of hyperlinks to related sites.

3.2 Design Processes

Origins

While a student at San Francisco State University, I was approached by TWI to develop the educational website for that organization. The timing was excellent, because I was searching for a final project for Dr. Hollenbeck's ITEC 845 class, as well as a worthy Field Study topic for ISED 895. After multiple detailed discussions by phone and email with the project directors and scientists at TWI, a basic "game plan" was hashed out as to how the website should take shape. I knew that I had some of the technical skills needed to pull off the job, but I knew I was going to have to learn a lot, and quickly, if I was going to get the site up and running in the required time frame.

While I was in ITEC 845, learning advanced HTML, Web architecture and basic JavaScript, I was simultaneously enrolled in ITEC 740 with Denise Richards, where I was learning the Web graphics skills and PhotoShop techniques that I would need for the job. I spent much of this early period communicating with TWI, learning as much as I could about web design and graphics, and hoping that I would be able to put everything together to the satisfaction of my professors and TWI in the allotted timeframe.

Software

Being new to Web design, having only taken ITEC 745 the previous semester, I had no particular expertise in any software. I used a PC at home and of course a Mac at San Francisco State, and this had been the source of frustration since both systems are unique, and seem more so to someone trying to learn quickly. I decided to do most of my Web development work at home on my PC. Therefore, I chose Homesite as my Web editor instead of BBEdit, which I struggled with at SFSU. However, since midway through the semester in which I took ITEC 845, Hollenbeck introduced Dreamweaver, and though I found it cumbersome at first, I quickly realized that it would save time in the long run. It became my main Web development tool while creating the TWI site.

Having no previous computer graphics experience, I really struggled with PhotoShop in ITEC 740. Nothing was intuitive and nothing made sense while tried to retrain my mind to think of images in the way that Web graphic development requires. Eventually I caught on and focused on what I thought I needed to know in order to create the images that I felt were necessary for the TWI site. I also developed some proficiency in Paint Shop Pro, as it was easier to use than PhotoShop for some tasks.

Other Web tools used were WinZip, which I utilized frequently as text and images were exchanged between TWI in Austin and my “web shop” in San Francisco. In one instance, I was sent a huge zip file containing a PowerPoint presentation that TWI had used in demonstration presentations. My job was to “reconstitute” this presentation for the TWI website. That meant picking out and reconstructing each PowerPoint image onto its own individual web page. This was a time-consuming task that would’ve been impossible without the use of WinZip, due to the large amount of information exchanged.

Interactivity

In early discussions with TWI staff, it was made clear that the TWI website needed to be accessible and easy to use. A large number of anticipated users would not be “web savvy” and would need to “held by the hand” while visiting the TWI site. Many users would be accessing the site by slow dial-up modems and older PCs.

Therefore, from the outset, I knew that I needed to design a site that used basic, simple technology to provide the widest user access. To limit page download times, I made graphics as simple as possible and used PhotoShop to reduce image size to the lowest visually-acceptable levels.

Also, I planned to incorporate Cascading Style Sheets (CSS) to reduce page size and also make site updates easier and less cumbersome.

Though I kept the use of JavaScript and other client-side programming to a minimum, I did use JS designed pop-up windows throughout the instructional portion of the site. After several iterations to seek the most user-friendly and helpful format for presenting the material, the JS pop-ups seemed to be the method favored by TWI staffers. I also used a simple web form to allow site users to request more information by typing their requests in a field which was then emailed directly to TWI.

Finally, in keeping with the “simplicity and accessibility” theme favored by TWI, I chose to follow Jakob Nielsen’s advice and designed the site’s pages to be scalable. Rather than design for a site dimension set at 640x480 - the “lowest common denominator” approach favored by many site designers - I elected to allow the site’s pages to “adjust” to the viewing area of the users particular Web device, be it palm pilot, cell phone, WebTV or 21-inch monitor. Though as designer I lose some control over the precise layout viewed by the user, The site’s content (the most important element) is presented much more effectively.

Architecture

Storyboarding was the technique used to develop the content of the site, as TWI staff and I exchanged ideas by email. The staff had a mostly clear sense about what information they wanted on the site; they simply didn't know how to package it in "content chunks." I helped develop the headings for the chunks and then, exchanging storyboards with TWI, figured out what information would go where.

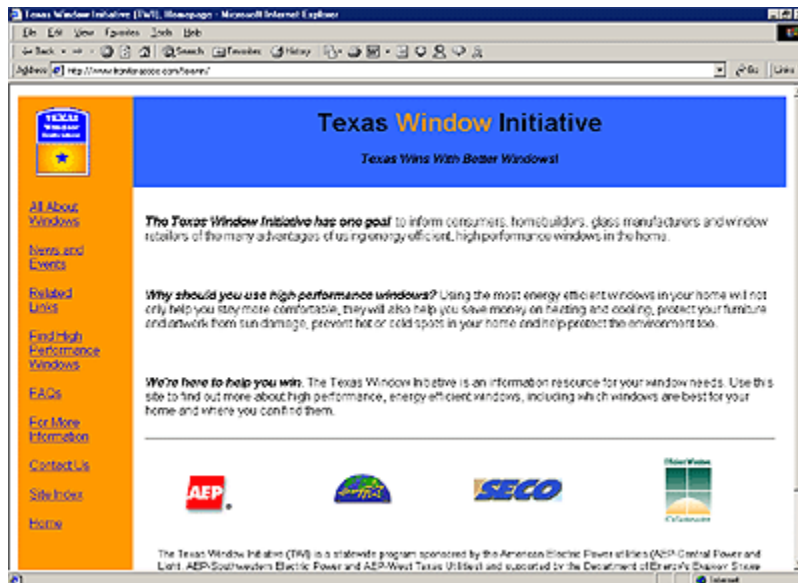
The TWI site architecture had to be straight-forward and easy to understand, allowing trouble-free navigation for inexperienced users. It made sense to not try anything innovative or "cutting edge" since the site would be easiest to navigate for the majority of users if it conformed to navigational systems found on most other websites. Therefore, a left side navigational strip was chosen for the TWI site. This strip is designed to appear on each page, giving the user the sense that they always know where they are and can always find their way back. The TWI logo, positioned in the upper left corner on each page, also conforms to the Web standard of providing a link to the home page by way of a hyperlinked logo.

As in the future I might no longer be the TWI Webmaster, the site was designed to make revisions and additions manageable and easy by anyone with basic Web design skills. For example, ample room was left in the navigational area for additional topic buttons to be added. Further, all pages were designed to scroll down “forever,” allowing new material to be added infinitum. These architectural methods will allow the site room to grow for the foreseeable future.

Aesthetics

Knowing that the overarching concern of the TWI staff was that the site be inviting and easy to navigate for novice Web users, I tried to incorporate a “look and feel” that was inviting and not intimidating, while at the same time projecting a professional image.

To achieve this, I settled on a simple vibrant color scheme utilizing three basic colors (orange, yellow and blue), used consistently throughout the site. I chose this scheme for several reasons. First, these colors signified a “safe area” for the novice user, clearly demarcating the TWI website from other sites that the user may stray into, whether by hyperlink or otherwise.



Simple, vibrant color scheme

Second, the repetition of colors on every page help reinforce an “image” of TWI in the mind of the user. This may work to “spark” a user’s memory when they see TWI store displays or trade journal advertisements which are all colored orange, yellow and blue. This should act to increase user confidence in high technology Electric windows and prompting a purchase.

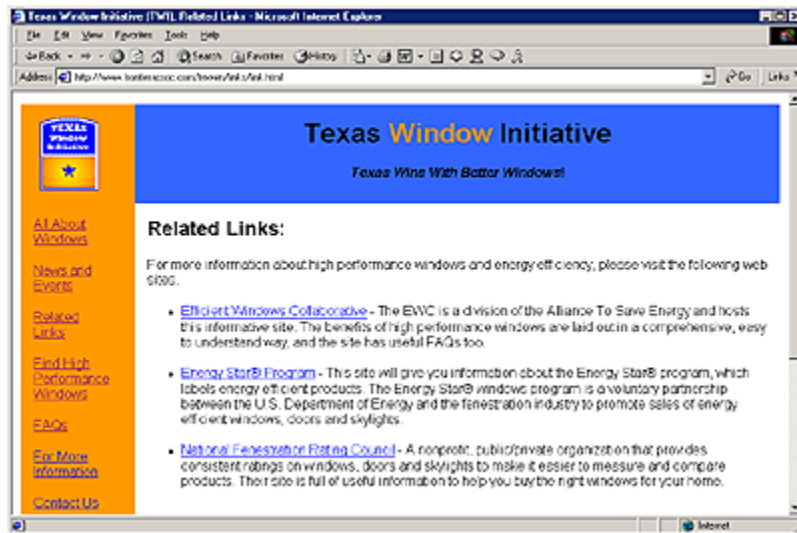
Third, I incorporated a TWI logo based on the same color scheme and featured in the upper left corner of each page. This logo featured a star, reminiscent of the “Lone Star” of Texas, sitting within a windowpane border. The purpose was to appeal to the Texans’ great love of their land

and history. The subtle message I tried to convey here was that the TWI site represented something that was good for Texas: learning about high technology windows might help Texans save money on energy bills as well as save the state's -- and secondarily the earth's -- environment.



TWI logo: "Lone Star within a windowpane" design

Lastly, I decided to give all pages incorporating text a white background. White, the "fourth" color in the scheme, works well with the other three colors aesthetically. Further, various Web usability studies have shown that reading black text on a white background is the most efficient combination, while also the easiest on the eyes.



Black text on white background

Content

From the beginning it was clear that the TWI site would be content heavy.

Not only did the site have to get across what TWI was, and what its mission was, it had to persuade its audience to make a radical change.

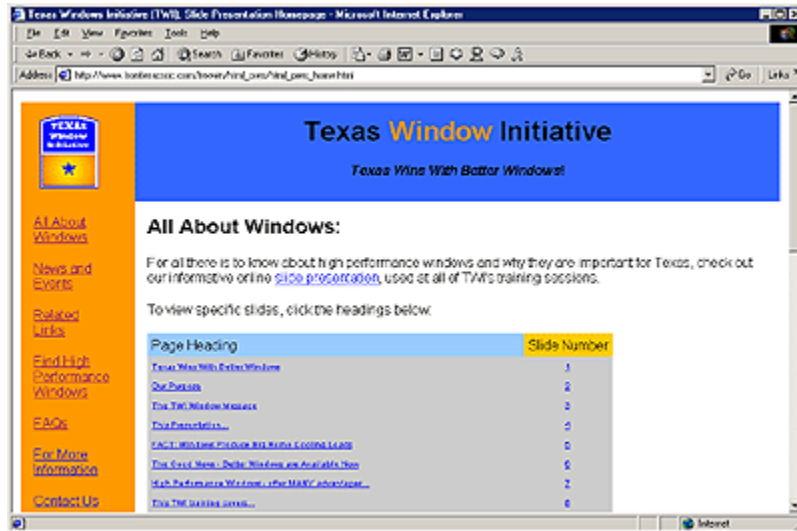
Convincing the public to accept that multiple, increased benefits would result from installing “high technology” windows instead of “mainstream” windows is not and easy task. And convincing builders, contractors and window retailers is an even a tougher sell, considering that those groups are usually trying to cut cost in the short term, rather than take the long term approach to savings that TWI is trying to promote.

The TWI project leaders and I agreed that the best tactic to bring about this change was to present as much scientific information as possible on the site. But knowing that audiences would tire easily of reading through pages after HTML page of scientific articles and arcane data, I needed to find ways to make this information palatable and user-friendly to the non-technical target audience.

Through much trial and error on my part, and frequent back and forth “storyboarding” with TWI staff, I finally hammered out a design for the presentation of the site’s content. I divided the content into eight sections or “chunks” which became the 8 links featured in the left-hand navigational bar of each TWI web page. Following is a description of each of those sections.

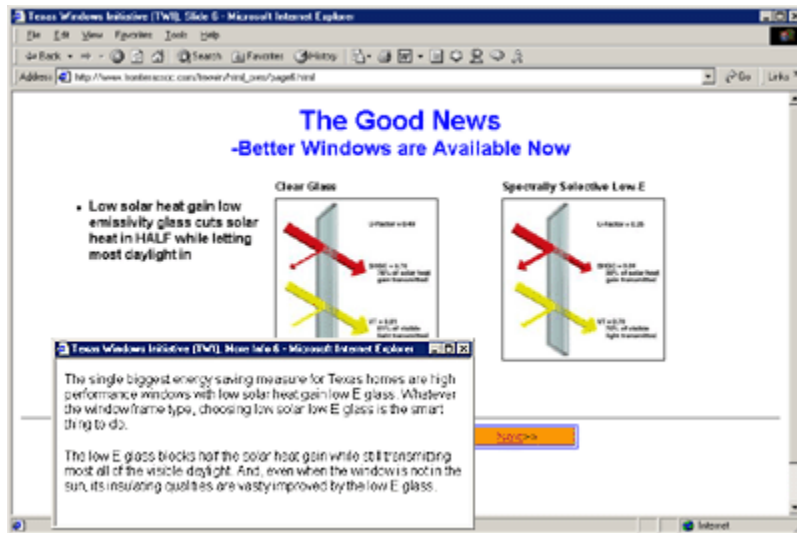
All About Windows

This section contains the real “meat” of the website, as it’s the major instructional learning component of the site. I placed this section’s link at the top of the navigation bar, knowing that it’s the information that the majority of users would want to access first.



The “All About Windows” section

This section incorporates images more frequently than any other section, as they help to illustrate complex scientific concepts. In order not to crowd the pages with too much information, I incorporated a link on the bottom of each paged called “Want more information?” This triggers a JavaScript pop-up which provides more detailed information than exists on the original page alone.



Page 6 of “All About Windows” incorporating JavaScript pop-up window

At 32 HTML pages in length, this section is by far the largest on the site.

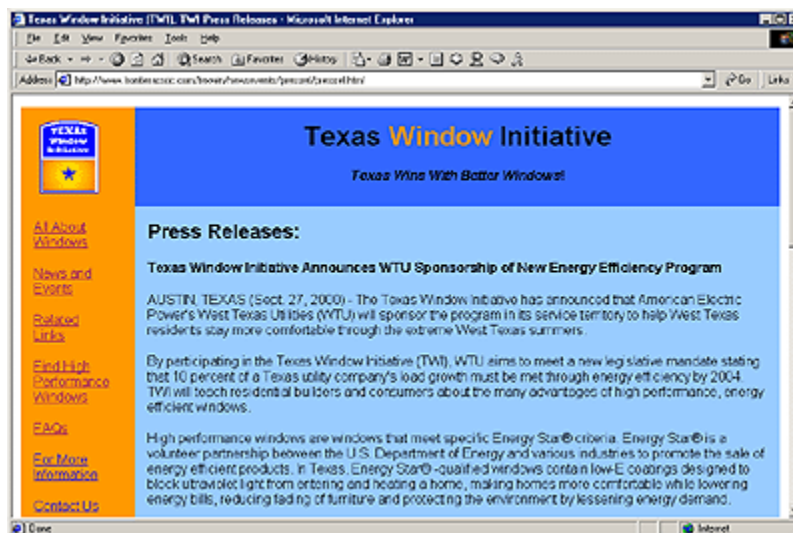
After a brief introduction to TWI, the section features the following topics:

- *The Benefits of High Performance Windows,*
- *What makes a window High Performance?*
- *How High Performance Windows Work*
- *Window Energy Basics*
- *The Insulating Glass Unit*
- *The Solar Spectrum*
- *Solar and Non-solar Heat Gain*
- *Peak Demand Savings*

News and Events

This section, featured second highest on the navigational bar, allows users to keep abreast of recent developments regarding windows and related topics.

This is useful because new studies and findings are constantly being published, and government regulations are continually changing. Also, featuring a chronology of TWI press releases, this section helps users keep up to date with all window developments.



Press Releases page from “News and Events” section

Related Links

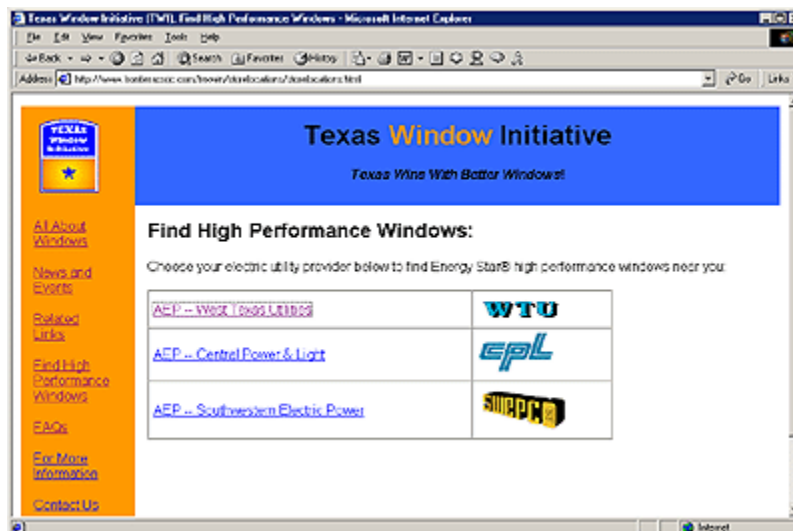
This section features a collection of links that may lead to windows information not available on the TWI website. Most links lead to sites that contain tangential information far too detailed and esoteric for TWI's scope. This page is for designed for users searching for a specific piece of data on high-performance windows or who simply want to immerse themselves in windows technology topics. This section includes links to organizations such as:

- *Efficient Windows Collaborative*
- *National Fenestration Ratings Council*
- *Energy Star Program*
- *State Energy Conservation Office*
- *American Electrical Power*

Find High Performance Windows

Users who have decided to pursue more information about how high performance could work for their needs will find this section helpful. It is designed to enable the user to quickly find a high-technology windows retailer or supplier near them. The user simply selects the link of the Power Utility the serves their geographic location, and then continues to select links arranged by region until finding the windows source nearest

them. For a state the size of Texas, this is a helpful aid, as high-technology windows providers are still few and far between.



“Find High Performance Windows” section

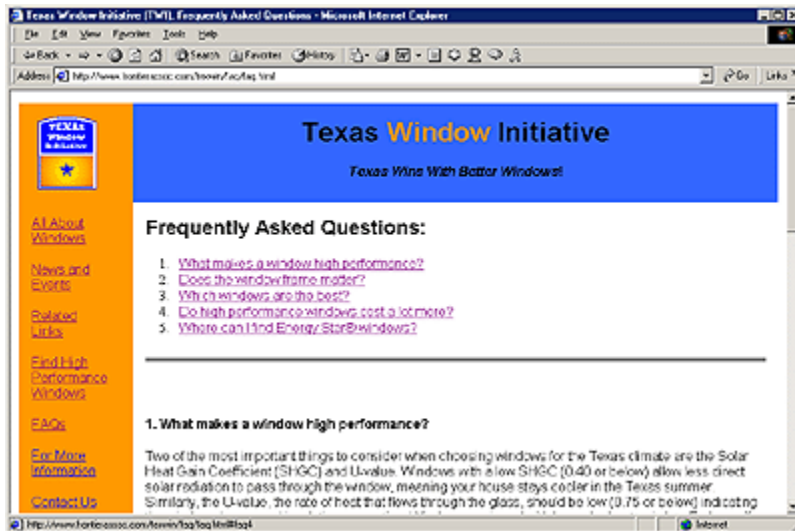
FAQ's

Common on many websites these days, I decided that a FAQ section was also appropriate on the TWI site. I anticipated people to be quite confused once they have arrived at the site, and most won't know much about what TWI is trying to achieve or what “high-technology” windows are all about.

Some sample FAQ questions from the site include:

- *What makes a window high performance?*
- *Does the window frame matter?*

- Which windows are the best?
- Do high performance windows cost a lot more?
- Where can I find Energy Star windows?



“FAQ” section

Other Content Sections

Additional content features include a *For More Information* page. In addition to the TWI street and mailing address, phone fax and email numbers, this page includes a form that enables the user to enter their question or concern into a text field. This is then emailed to TWI staff, who can then act on the user’s request.

To help users find information on the site effectively, I have incorporated a site *index page* and well as a *search box* on the home page. This is again standard practice on all current websites, and it makes sense to provide the users with a quick and easy way to find what they want on the site, in a way that the are familiar with.

SECTION 4: FORMATIVE EVALUATION

4.1 Introduction

The purpose of this formative evaluation was to determine if the website met the objectives of the TWI project leaders. In order to get that information, I would need their feedback about the site. I created a survey to assess their reactions to the site, both positive and negative. Armed with these data, I then made changes to the site to reflect the TWI staff input.

4.2 Survey Participants

The survey participants for this post-evaluation survey were the 6 staffers at TWI. This consisted of 3 research scientists, 2 marketing/public relations personnel and a former electric utility engineer.

4.3 Data Collection

The formative evaluation was created in the format of a survey. The launch date of the site had been set by TWI for mid-January 2001, and I had the “rough” version of the site (www.texwin.com) ready for review by early December. This gave them several weeks to evaluate the site and provide their comments on the survey form. I then would read through their recommendations for improvement and incorporate their ideas into the site.

The survey form I created consisted of ten Likert scale questions. At the end of the form, I provided the respondents the opportunity to write about anything they felt could be improved on the site that I had not covered in the 10 questions (Please refer Appendix B).

4.4 Data Analysis

After administering and collecting the survey forms from the 6 TWI staff participants, I went about looking for clues from the resulting data which

pointed to how I might revise and strengthen the site. Most of the participants reported generally positively on the Likert scale questions which made up the bulk of the survey. This was probably a result of the frequent consultations I had had with the staff prior to and throughout the design phase of the site.

However, most participants did provide feedback of some sort in the “recommendations/suggestions” section of the survey requiring me to make some type of modification to the site. Most of these comments pertained to detailed specifics of the content design, rather than major structural issues. For example, one participant requested:

On the slide show (instructional section), it would be nice if you could leave the slide show and get back to the main page without having to back up through all the slides previously viewed.

Clearly, some participants didn’t realize that the TWI logo is a hyperlink to the homepage, and is featured on the upper left of every page. Though this is now considered a Web “convention,” I chose to build-in a redundancy and add a link to the left-hand navigation bar titled “Home.”

Following are some of the other participant requests:

- *Can the “more” breaks or symbols be deleted from the Press Releases page?*
- *Would you please take out the link to the Alliance to Save Energy (since we already have a link to the Efficient Windows Collaborative, which they manage).*
- *Take out the links to the LBNL (since the NFRC website has their content) as well as the Florida Solar Energy Center.*
- *Let’s take out the “upcoming training sessions” for now. I like the idea of posting them but, unfortunately, the training sessions are usually not scheduled until a couple days before they occur. So, it would be too difficult to keep such information current.*
- *Is info@TexWin.com a valid email address (I’m not sure myself)? If not, use deeanne@texwin.com or bill@texwin.com, since I know those are being read.*

After making the corrections and modifications to the participant requests listed above, the TWI project leaders approved and signed off on the work, and the site was ready. I then uploaded the files to TWI's server without incident, and on January 18, 2001, www.texwin.com went live.

SECTION 5: PROJECT SUMMARY & CONCLUSION

5.1 Summary

This field study was to create a website designed to help various groups (builders, contractors, window manufacturers and the general public) educate themselves about the myriad benefits of high technology windows. I explored the World Wide Web and conducted a literature review on the subject of high technology windows and discovered that though there are several organizations doing similar work to TWI, none of these organizations incorporate a website to achieve their educational goals. I conducted a needs assessment and discovered that the TWI staffers had definite ideas about what they wanted and did not want regarding their website.

After spending several months creating the site, consulting frequently with TWI staffers throughout the entire process, the site was ready to be critiqued. I conducted a formative evaluation with a survey as the tool. I then reviewed the participant's completed surveys, and made the requested changes to the site.

5.2 Conclusion

This field study has allowed me to put to practical use the skills I have learned in the DAIS/Instructional Design program at San Francisco State University. But it has done more than that. In most of my academic history, I have not had the opportunity to apply what I have learned as completely as I have while working on this project. In the past, I had always felt a "disconnect" between my academic and work experiences. With this project, I finally felt a perfect synthesis of intellectual training combined with practical skill.

Additionally, it was quite an honor to come to be depended upon for my skills and expertise. The Texas Windows Initiative had approached me to plan, design and build their educational site, and though it was the "perfect" field study project, I worried in the early stages that I might not be able to pull the whole thing off. But with the help and patience of my

professors, fellow students, and certain San Francisco State University administrators, I was able to complete the site to the satisfaction of all involved. To me, that is quite an accomplishment.

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APPENDIX A

Glossary

- *TWI*: Texas Window Initiative
- *High performance windows*: windows that incorporate the following features – multiple layers of glass, low-emittance coatings, solar control glazings and coatings, low-conductance gas fills, warm edge spacers, thermally improved sash and frame and improved weather-stripping.
- *Low emittance*: high reflectance to long-wavelength infrared radiation, reducing total heat transfer.
- *Spectrally selective low emissivity glass*: Glass that allows light to pass through without the heat. It selectively transmits or reflects specific wavelengths, giving excellent shading and visibility.
- *Energy Star*: A designation developed by the US Department of Energy (DOE) and the Environmental Protection Agency (EPA) for products meeting certain energy-efficiency criteria.
- *EWC*: Efficient Windows Collaborative
- *LBNL*: Lawrence Berkeley National Labs
- *NFRC*: National Fenestration Rating Council
- *SECO*: State Energy Conservation Office
- *AEP*: American Electrical Power

- *WTU*: West Texas Utilities
- *CP&L*: Central Power & Light
- *SWEPCO*: Southwestern Electric Power
- *Fenestration*: A window, door or skylight and its associated interior or exterior parts, such as blinds or shutters.
- *UV*: Ultra violet. A type of radiation found in sunlight that can damage paint finishes, carpets and fabrics.
- *U-factor*: the standard way to measure a window's insulating value. It indicates the rate of heat transfer through the window. A lower U-factor indicates better insulating.
- *Low-E*: Low-emittance. Microscopically thin coatings that when applied to window surfaces suppress radiative heat flow and thus reduce the U-factor.
- *Backward repurposing*: The process of reusing already existing programs or materials, such as a PowerPoint presentation or CD-ROM, on the Web.
- *CSS*: Cascading Style Sheets – a web technology that allows designers more control over how pages are displayed.

APPENDIX B

Texas Window Initiative Web Site Survey Questionnaire:

The web site had accurate information. Agree
1 2 3 4 Disagree

The web site had enough information. Agree
1 2 3 4 Disagree

On each page, I understood where I was in relation to the rest of the site.
Agree 1 2 3 4 Disagree

The images helped me understand the scientific concepts. Agree
1 2 3 4 Disagree

The time it took the pages to load was acceptable. Agree
1 2 3 4 Disagree

The information was presented in logical, easy to digest sections. Agree
1 2 3 4 Disagree

The page titles, headings, and subheadings in the text made sense. Agree
1 2 3 4 Disagree

The text size and background color enhanced readability. Agree
1 2 3 4 Disagree

I plan to use the web site in the future. Agree
1 2 3 4 Disagree

I would recommend this web site to others window professionals. Agree
1 2 3 4 Disagree

Below, please include any and all suggestions that will help better achieve the objectives of the TWI: