

**Greenfield Plant Farm
Web Solution**

By

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Submitted to
the Faculty of the Information Engineering Technology Program
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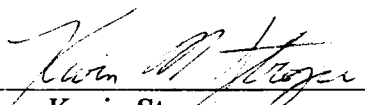
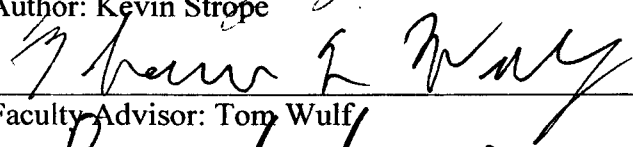
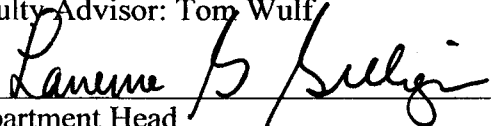
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Abstract

This presentation explains the development of a Web solution that acts as a marketing tool and a maintainable inventory for a plant nursery. The site creates a Web presence for a small town company that needs a more efficient way of communicating with its customer base and keeping constantly changing information updated. The site for Greenfield Plant Farm incorporates the use of Web forms, Active Server Pages, database interaction, and client-side interface.

Greenfield Plant Farm Web Solution

1 Problem Statement

Greenfield Plant Farm is a small privately owned nursery located in rural Mainville, Ohio. It has a large line of plants, flowers, trees and shrubbery that it supplies to retailers and wholesalers. The low traffic flow around the area of the company encourages other means of advertising rather than depending on potential walk-ins. Current advertising consists mainly of word of mouth and referrals from social events that Greenfield participates in.

Contact is established to current customers through the mail only once or twice a year because of the timely and expensive processing. Printing, packaging and shipping charges are required to complete such transactions. The only form of collecting customer contact information currently is at social events and from customers that visit the store front.

An ever changing inventory is difficult to portray to customers as seasonal demands depict what will or will not be available. Through a Web based, manageable database, the inventory can be maintained by authorized site administrators and can be continually updated to reflect a more accurate listing of Greenfield's inventory.

2 Solution

A Web presence has many benefits including a method of advertising. This also allows a way to collect new customer contacts and create a database that can be used in combination with a listserv to send e-mail to increase the frequency of customer contact without the restrictions of printing or packaging constraints.

A Web form allows a Web master(s) to manage the inventory database over the Internet. This database displays the current available inventory that Greenfield Plant Farm has to offer. Existing records can be changed or removed and new records can be added.

For beginners the site offers information on how to get started as a serious plant grower. Existing plant extremists may find tips on how to improve and maintain their current collections. Garden theme designs are offered as a free resource that is offered on the site and through e-mail. Along with providing information, Greenfield's site creates a community for gardeners across the Internet to share ideas through Greenfield's Greenthumb Club. The club offers featured articles, a calendar of events, upcoming specials and a message board to exchange ideas from fellow gardeners.

2.1 User Profile

Greenfield Plant Farm is not an average garden supply store. Emphasizing on perennial plants, Greenfield offers a variety of rare, hard to find, plants. Its products are offered to both retail and wholesale consumers. With this in mind, there are three primary types of users that may find this site valuable. Beginner gardeners who are looking for ideas on how to get started is one user profile. Plant extremists, the second user profile, has the opportunity to find out what's hot on the market, current news and related information. The third user profile is Greenfield employees that are responsible for maintaining calendar events, featured articles, and current inventory availability.

Profiles:

- *Beginner* – The beginner user most commonly is a new customer to Greenfield Plant Farm. These users are seeking information on perennials, how to get started with creating theme based gardens, such as butterfly or stem gardens, and other information related to rare plants. This type of user may also be drawn to

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Greenfield's Greenthumbs Club and other societies listed on the site. A resource list of recommended readings and popular societies may also be beneficial to this user. This user also finds the calendar of social events, upcoming sales and specials at Greenfield.

- *Extremists* – The extremist user is interested in more of what's new in the market corresponding with new species or even the latest fungus outbreak. These particular users may be existing customers or new to the site. Tips & tricks along with up-to-date care for plant illnesses and pest control is provided to be useful to such gardeners. This user may also find the items listed in the beginner user profile valuable content as well.
- *Greenfield employees* – The third type of user profile has an administration role with the Web site. This particular user has access to remotely administer the inventory database, administrator account management and maintain the message board from any machine that has Internet access. Featured articles along with keeping the "What's New" section of the site up-to-date is also the responsibility of this user.

2.2 Design Protocols

The purpose of this project, among creating a Web presence, is to allow Greenfield Plant Farm to expose what it has to offer to the world and to perform tedious tasks in a more efficient manner. In creating a professional representation of a company on the Web, certain values must be met to make the site a success. The first value to incorporate is simply the identity of the company. This is typical information about the company such as its history, products or services and store location.

The next value is context, this gives the visitor a reason to come back. Why have a site that is only useful for a one time visit? The site offers a reference to many lists of plants, featured articles from the plant industry, calendar of events and other informative information that is updated as needed.

Lastly, community brings a group of people together that share a common interest. The Greenfield's Greenthumb Club was created as a way to give visitors a sense of belonging. This also doubles as a marketing tool for Greenfield. Members are e-mailed

information on upcoming promotions and events. Members seeking advice can participate on the member message board.

3 Deliverables

- Develop and interactive Web site that expands Greenfield's availability.
- A user interface is provided through the use of HTML pages for Internet visitors.
- Active Server Pages provide a connection to an Access database to display inventory items.
- Visitors can register to join a community by using a Web form that collects the information using an ASP and stores the information in an Access database.
- Web administration allows Greenfield employees to maintain the inventory displayed through the use of an ASP.
- The over all experience provides the following for a visitor:
 - a. What Greenfield has to offer
 - b. Information on themes and general care for different plants
 - c. An opportunity to join Greenfield's Greenthumb Club
 - d. An opportunity to remove themselves from the club/ mailing list
 - e. Resource list that includes books, popular links and other clubs/societies
 - f. Allow a customer to view current inventory availability.

4 Design and Development

4.1 Budget

	<i>Company</i>	<i>Product Name</i>	<i>Product Function</i>	<i>Price</i>
Hardware		Digital Camera	Digital photographs of Greenfield	\$299.00
		Development System	Used for implementation of project	499.00
Software	Microsoft	Access	Database	309.00
	Microsoft	Visual Studio 6.0	Active Server Page development and debugging	497.00
	Macromedia	Firework	Create and manipulate graphics	319.00
	Macromedia	Dreamweaver	Design, structure and implement Web site	(Macromedia package)
Monthly Fees		DSL Connection	High speed Internet connection for site maintenance	40.00
		Web Host	Host site files	12.00
Total Project Cost				\$1923.00

Figure 1. Project Budget

4.2 Timeline

Project Timeline		
	Week Number	Description of task
Senior Design I	week 1-5	Discuss problem and solution with client
	week 1-5	Consultation with advisor
	week 6-10	First draft of proposal
	week 6-10	Finished Proposal
	week 6-10	Status Presentation
Senior Design II	week 1-5	Design Freeze
	week 1-5	Concept Web Site
	week 1-5	Client design evaluation
	week 6-10	Implement database
	week 6-10	Working draft of Web Site
	week 6-10	Submission of site to search engines
	week 6-10	Status Presentation
Senior Design III	week 1-5	Troubleshoot and debug
	week 6-10	Completed Project
	week 6-10	Tech Expo Presentation
	week 6-10	Final report on project details
	week 6-10	Submit final project and demonstrate functionality

Figure 2. Project Timeline

4.3 Hardware

The development computer used for the design implementation of this project is a Windows 2000 Professional based platform. Internet Information Server (IIS) was also used on this machine to establish a working Web host to run active server pages during development.

4.4 Software

Many different software packages were used to complete this project. Visual Studio was used to create Active Server Pages (ASP's) and write scripting. Dreamweaver and notepad were the primary tools used for creating HTML pages and the site structure. Fireworks allowed for the manipulation and creation of images used within the site and also to modify digital images taken at Greenfield Plant Farm.

5 Proof of Design

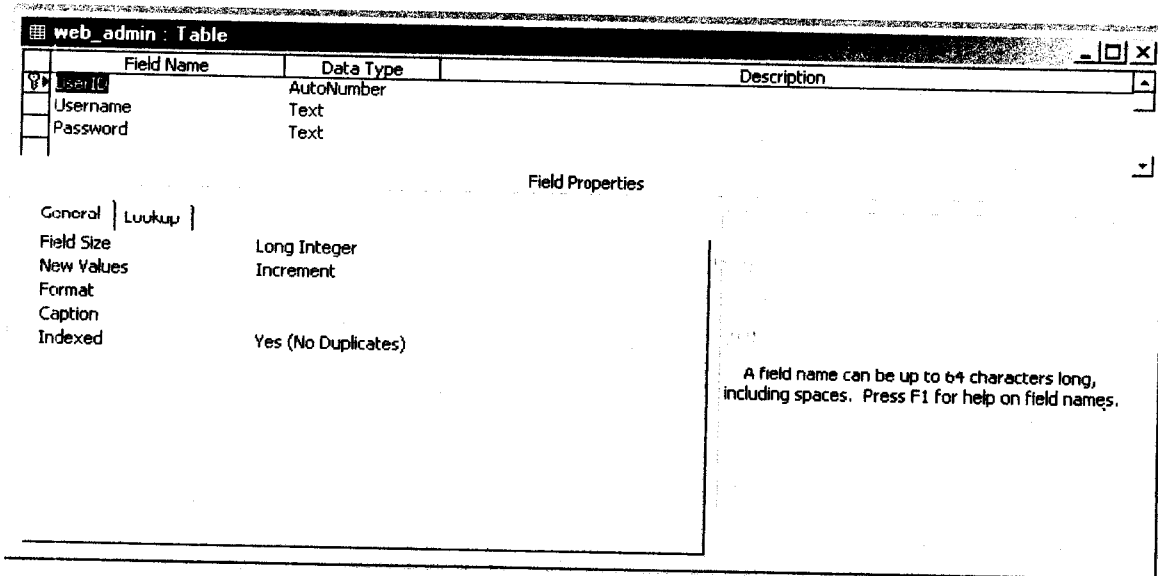
5.1 Database Usage

Greenfield uses Microsoft Access as its primary database application to store plant inventory, sales and financial information. Through active server pages, connections are made to the Pant_Notes table from Greenfield's Nursery1 database. This table stores over 40 fields of information on over 3000 plant records that exist in Greenfield's inventory. The Plant_Notes table, web_admin, user_reg and message table are stored on the Web server that hosts Greenfield's site. The web_admin table stores Greenfield's site administrator accounts. A username and password is stored for each account. Next, the user_reg table created collects personal contact information from visitors who sign up for Greenfield's Greenthumb Club. Lastly, the message table stores the username of the member, the time the message was posted and the actual message posted on the message board.

5.1.1 Web Administrator Table

Figure 3 shows the design view for the web_admin table. This simple table stores the user name and password for each administrator. A UserID is an auto-number that is generated for each record to make it unique. This field is used as the primary key and is

used to track sessions. These records are used to authenticate Web administrators for administrative access to the site. These users have full control of the inventory database, remove message board postings and the capability to create and modify existing Web administration accounts.



Field Name	Data Type	Description
<input checked="" type="checkbox"/> UserID	AutoNumber	
<input type="checkbox"/> Username	Text	
<input type="checkbox"/> Password	Text	

Field Properties	
General	Lookup
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	Yes (No Duplicates)

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Figure 3. Design view of web_admin table

5.1.2 Membership Contact Information

The user_reg table (see figure 4.) stores personal and optional information for Greenfield's Greenthumb Club members. A username is generated from the first initial and last name of the new member. A UserID is an auto generated number that is used to keep track of active sessions.

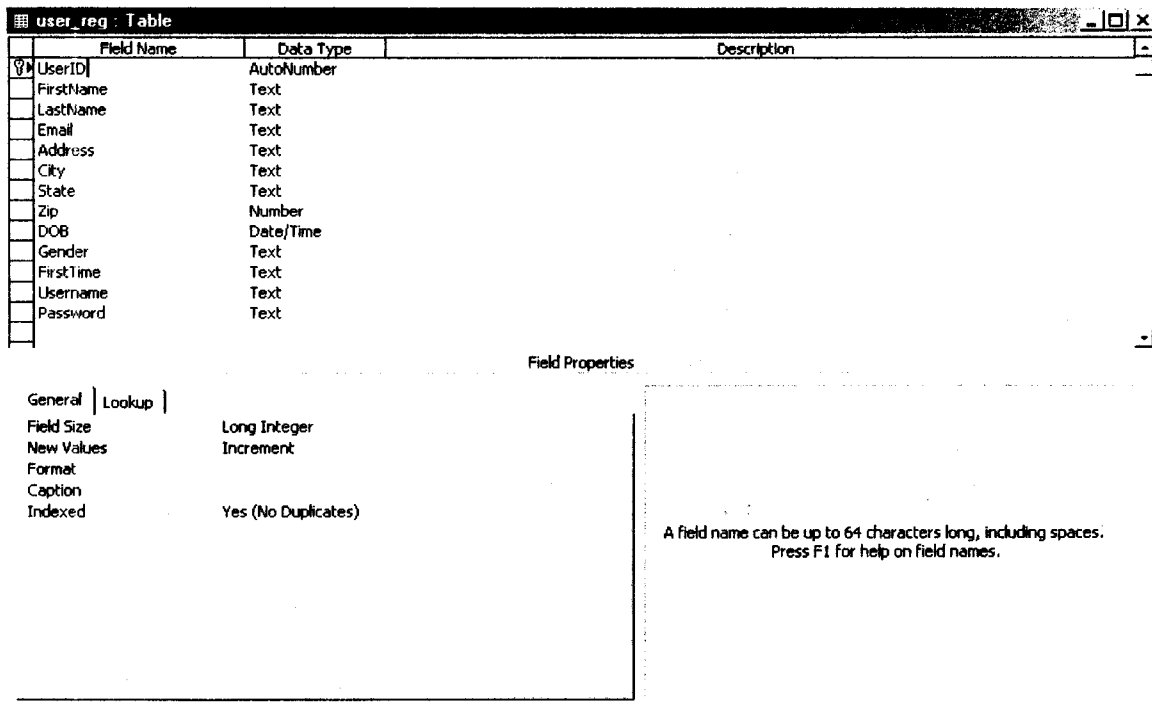


Figure 4. Design view of user_reg table

5.1.3 Message Board Entries

This table (see Figure 5.) interacts with the GPF_message_board.asp file. Posted messages are stored with a date/time stamp of when the message is posted and the username of the member who posted the message. These records can be managed by the site administrators in the rare case of inappropriate messages.

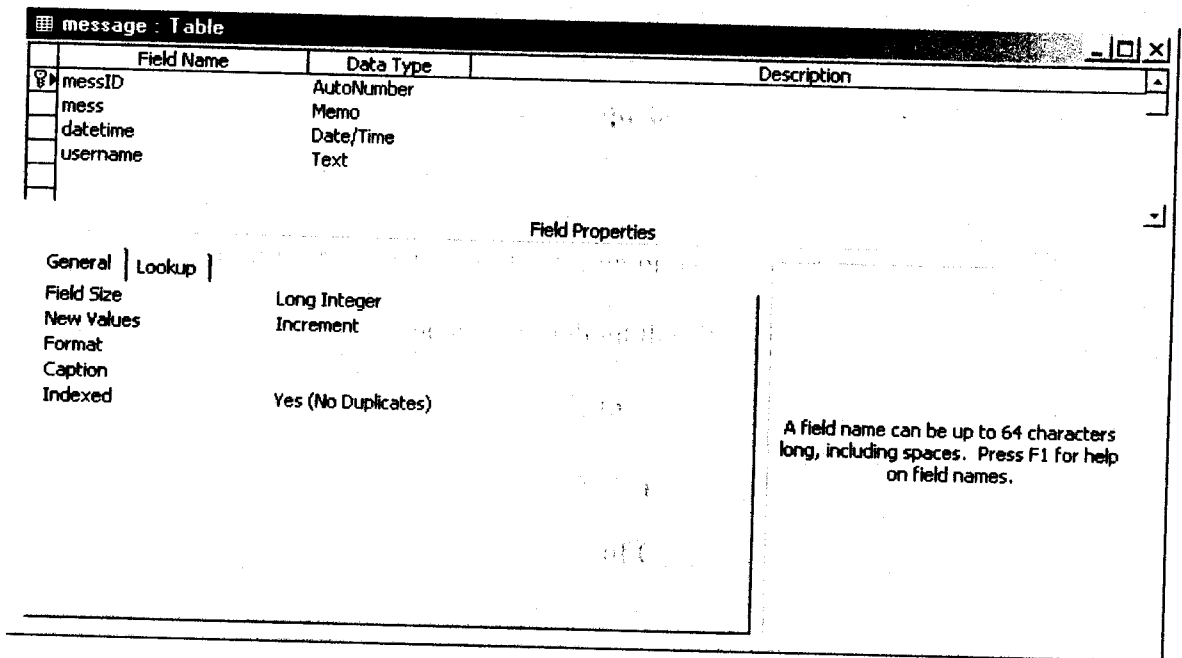


Figure 5. Design view of the message table

5.2 Interface Design

Usability was an important factor for the design process in implementing this site. Features such as common navigation menus throughout the site allows visitors to know where they are, what they are looking at and provide the ability to display any page within the site in no more than a couple clicks. A site help page is linked and displayed to every main file in the site. The following are features of Greenfield Plant Farm's Web solution:

- Inventory Search
- Visitor Club Registration
- Web Administrator Authentication
- Web Database Maintenance
- Member Message Board

5.2.1 Home Page

One of the most important aspects of a well planned Web site is a strong home page. This is a visitor's first impression, a Web site may only get one chance to grab and hold onto a visitor's attention. A visitor should be able to scan the home page easily and without confusion of flow. The home page should communicate to the visitor what the company is, what services or products it offers and what separates the site from its competitors. The design of Greenfield's home page (Figure 6.) displays its company logo in the upper left corner. The center-top of the home page tells the visitor what type of content they find within the site and that Greenfield is a perennial plant specialist, its unique value proposition (UVP).

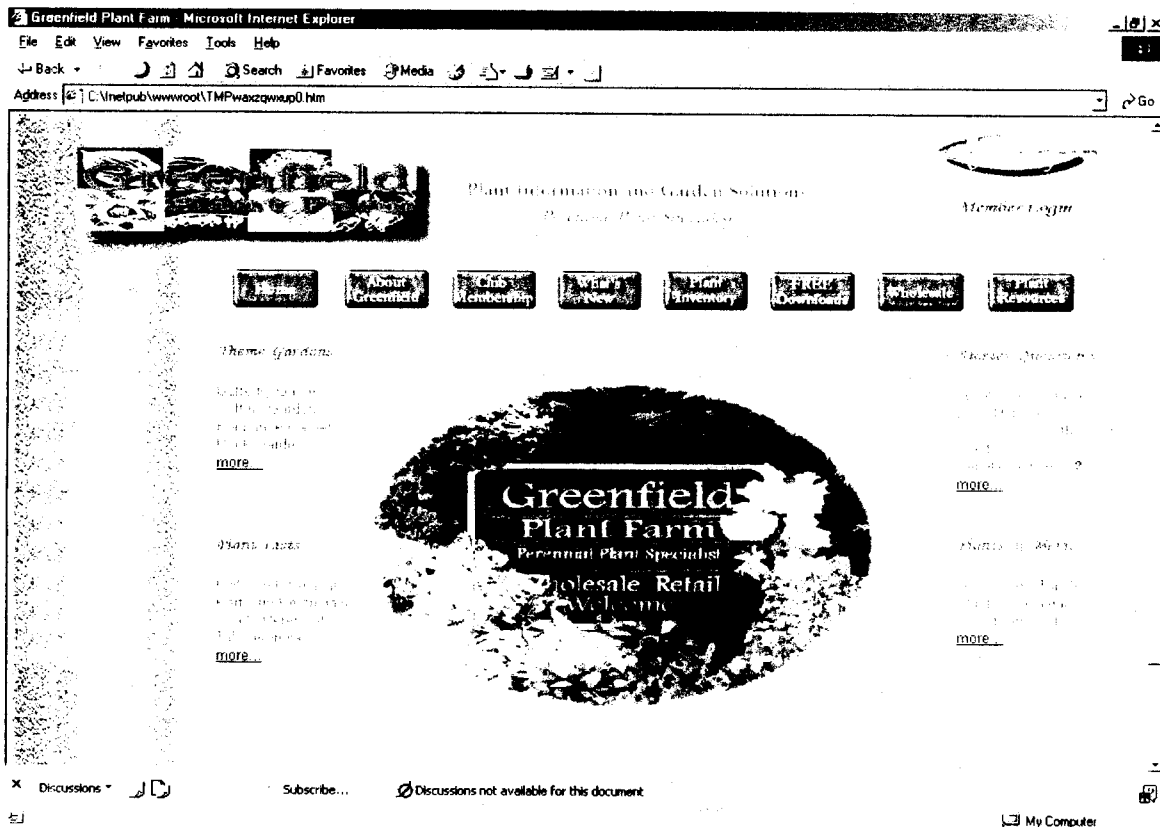


Figure 6. Greenfield Plant Farm home page

Another consideration for a successful Web site is the usability of the site. The brown buttons across the top of the page provide the primary navigation. Important content contained within each page of the primary navigation is listed on the secondary navigation along the left margin. Popular information is highlighted around the home page image in the center of the page. Each page within the site has two points of entry between the primary, secondary and popular links. Any page can be displayed within this site with no more than a couple clicks.

5.2.2 Plant Inventory

One of the features highlighted by this site allows visitors to query their interests with plant names against a database of over 3,000 different plants (Figure 7.). Once a query name is entered and submitted against the database, features of the plants that meet the criteria are displayed. Included on the inventory search page, a small listing of plants broken into categories for easy access for finding plant names can be found.

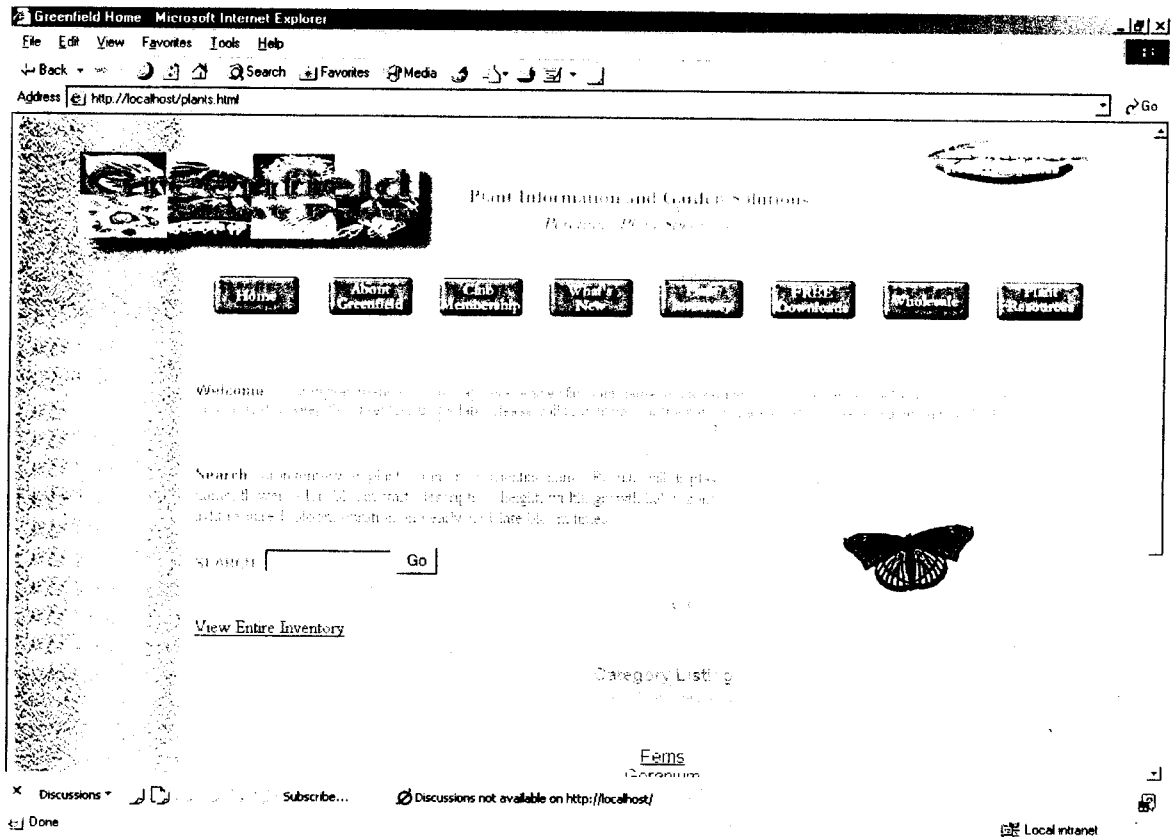


Figure 7. Plant inventory search page

5.2.3 Club Membership Registration

The New Greenfield Greenthumbs Club Membership Registration Web form (Figure 8.) is an active server page. This form is compatible with Internet Explorer 4.0+ and Netscape Navigator 4.0+. If the browser does not support the scripting the page still displays and works properly but client side validation does not take place, this is only a performance issue.

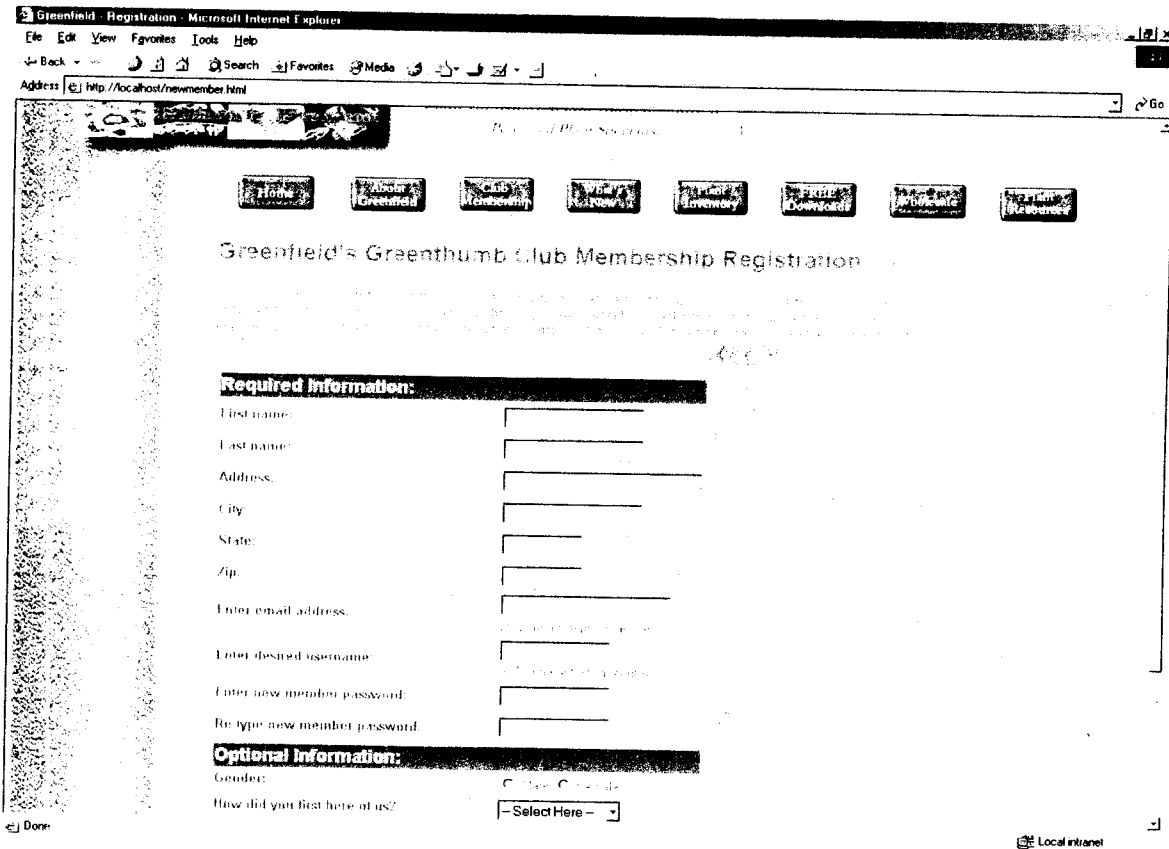


Figure 8. Club Membership Registration

Using validation to check for data entered in the required fields, a Web form collects the visitor's personal contact information and checks for valid entries before submitting the information to the server. Once the validation is passed the information entered by the visitor is re-displayed for the new members records. The account information can be updated by logging in from the site home page. The page creates a connection using ActiveX Data Object (ADO) to store the information entered on the form into the database table.

One of the important site values mentioned earlier in this report was community. This brings together people with similar interests. Greenfield's Greenthumb Club offers a variety of benefits including special promotions and a message board (see Figure 10.).

The message board allows for members to communicate with one another on any plant related topics.

5.2.4 Web Administration

The Greenfield Web Administration Login page (Figure 9.) allows Greenfield employees to authenticate and access the administration tools that are available. A Web administrator has the opportunity to manage administrator accounts, remove message board postings and maintain the inventory database (see Figure 10.).

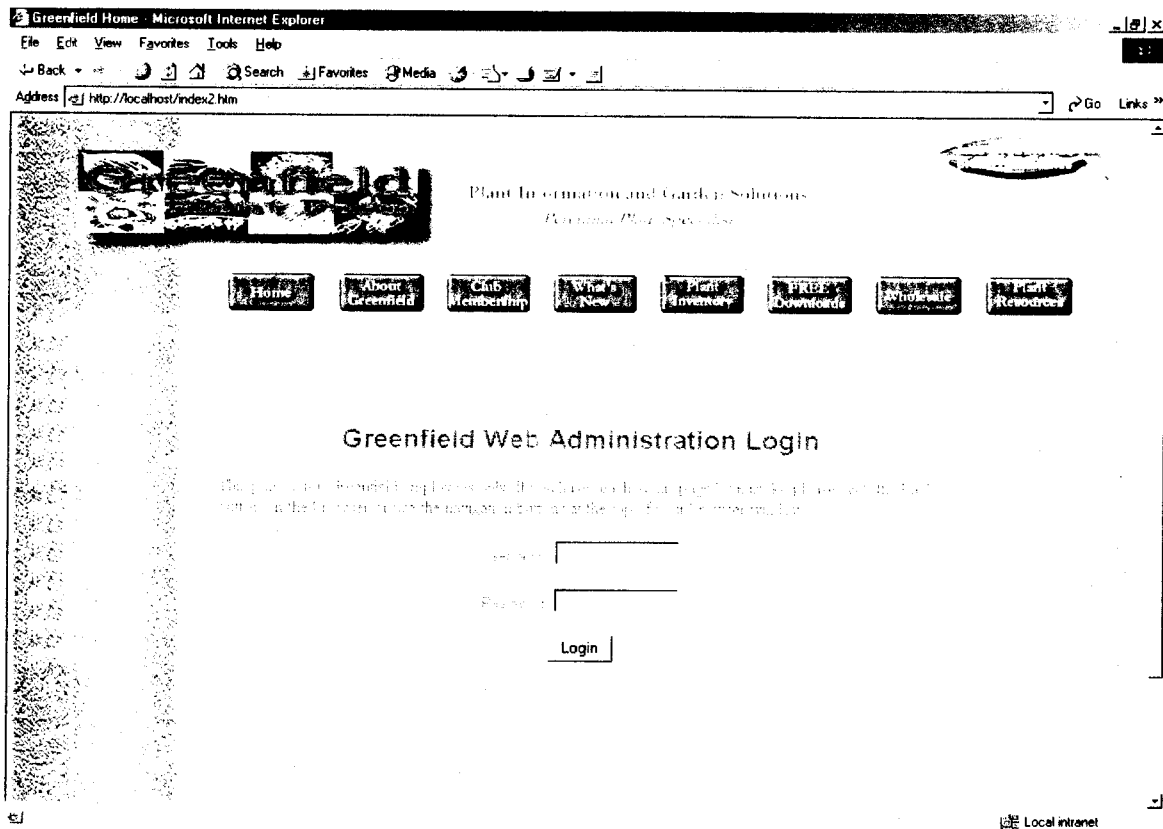


Figure 9. Greenfield Web Administration Login

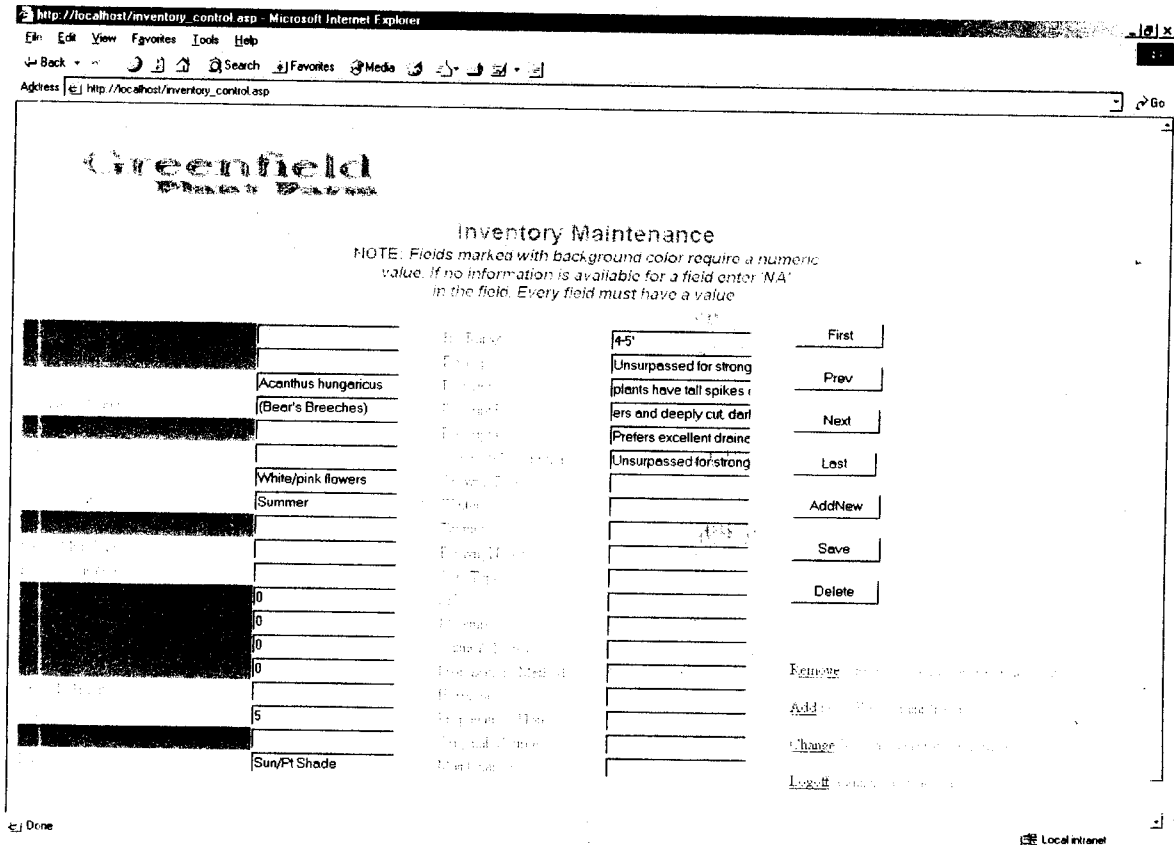


Figure 10. Web Administration – Inventory Maintenance

Once an administrator has been authenticated a session variable is created using their UserID. This allows only the administrator to view administrative pages. If a session variable was not used, the URL for the path to the corresponding page could be typed into the browser to view the page. A redirect to the login screen occurs if a sessionID is not found. The inventory maintenance page allows Web administrators to navigate through the records, add new, delete and update all records. This ASP uses OLEDB and ADO to connect to the back-end Access database stored on the Web host.

5.2.5 Message Board

Past posted messages are listed in order from the most recent entry. Following the list of messages a text area for data entry is displayed. Once the post message button is clicked the ASP checks for a session ID and verifies that there is text to be posted. At that

time the message is recorded, present date and time and member username are stored in the database and posted on the message board. Greenfield site administrators have the ability to remove any posting that they feel are not appropriate. Figure 10 shows the message board with a few sample postings.

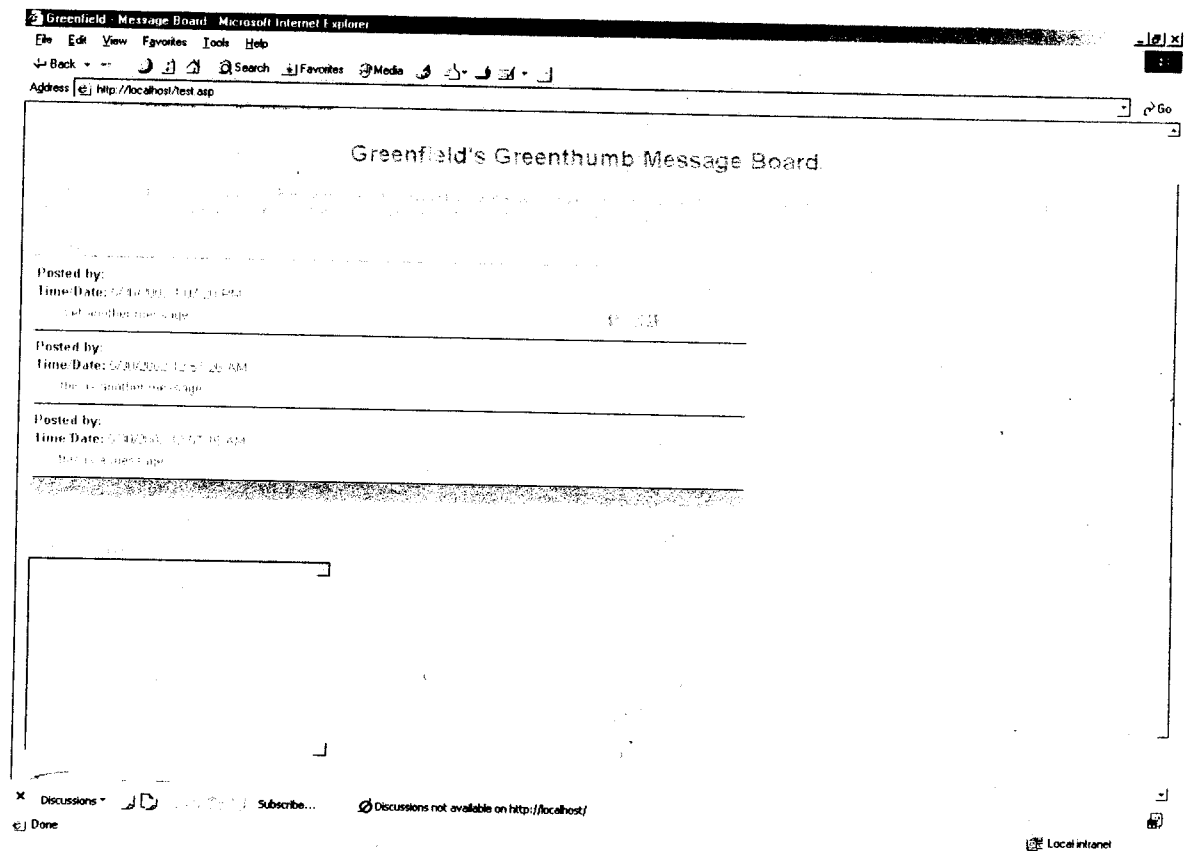


Figure 11. Member message board

6 Conclusion and Recommendations

Greenfield Plant Farm is proud to be represented by this Web presence and is currently available at www.greenfieldplantfarm.com. The entire staff has been very cooperative and enthusiastic during the design and production of this site. I have received positive feedback from the employees who have seen the project develop. Future plans for the site include having the database populated with digital images of all the plants available at Greenfield Plant Farm.

Web administrators for this site maintain and update information as needed. The final site contains more than 50 unique HTML pages, over 12 ASP's and an always growing number of images topping hundred currently. The site does meet all of the required deliverables but there are a couple features that could be added to the site.

One such feature that was already mentioned was the population of digital images of the plant inventory. There are more than 3000 different types of plants offered by Greenfield Plant Farm. Populating the database with such images went beyond the scope of this project but should be completed as plants become available. Once the images are put in place, these could be added to the plant search.

If the site proves to provide a benefit to the company, online ordering could greatly expand their sales to a national scale. Though a larger staff may be required to meet the needs for packaging to support an E-commerce Web site the revenue generated could very well out weigh the drawbacks of expanding the business.

Appendix A. Web Site ASP source Code

Can be found on project CD.

Appendix B.
Web Site HTML source Code

Can be found on project CD.

Appendix C.
Web Site Database(s)

Can be found on project CD.

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