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Project Number: PZW-2000-46

Developing a Web Site for Primarily Undergraduate Institutions for the American Society of Plant Physiologists

An Interactive Qualifying Project Report

Submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

by

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Approved

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Abstract: (QP)

This project was designed to implement a web communications system for Primarily Undergraduate Institutions that belong to the American Society of Plant Physiologists. This communications system allows people to keep up to date with useful information and other useful resources. The target of this project focused only on the northeast section only but provides a paradigm for connecting members nationally.

Acknowledgement: (QP)

We would like to take this opportunity to thank all ASPP members who responded to surveys and provided constructive feedbacks.

We specially thank Amy Marr, WPI Webmaster, who provided us an account on WPI's server to test our web site.

We gratefully thank our project advisor Professor Pam Weathers for her guidance and suggestions throughout our project.

We also would like to thank Trung Tran for the animated plant picture.

I. Introduction (QP)

Web communications for the American Society of Plant Physiologists (ASPP) may lead to a greater interaction among Primarily Undergraduate Institutions (PUIs), faculty, students, and industry. Ultimately, this will improve communication in terms of organization and easy access to information.

A variety of obstacles, however, hinder the development of such a web site. These include:

- Composing a site that people agree on and that is easy to use
- The lack of uniform standards for page design on the World Wide Web
- Backwards compatibility issues (Older versions of Netscape/Internet Explorer).

We have concentrated our research on a pre and post survey, which will gather appropriate data in the development of a site that will meet most users needs by:

- Proper analysis of the data collected by the survey
- Implementation of these data in the development of a site that suits the needs of the intended groups.

II. Background (QP)

A. Communication challenges facing PUI faculty and students

PUI faculty and students are facing many difficulties with communication. It is hard for them to contact each other and remain current with events and news relevant to plant science and education research that might have a focus on undergraduate participation. The faculty and students want to establish means for easily communicating with one another. They want to have a web site that includes all the PUI's in the northeast region and that would serve as a communication device between these schools. With this web site, faculty and students would be able to contact other faculty and students from other schools with information such as email information and telephone numbers. They don't have to look in any outdated directory to find this information. All they need is Internet access and a web browser. Web communication can provide people with many other features such as chat rooms, events listings, possible speakers with great topics, payment via credit card for registration to events, and meetings. With the chat room feature, faculty and industry professionals can have meetings online for discussions. Also, faculty can provide live interactive help sessions for students. Many people have a hard time finding dates for meetings and events, thus an events listing would prove useful for announcing important activities and meetings. Information about when speakers would come to a school to speak or give lectures could be found through a page that lists this information. If an individual wanted to attend an event or meeting, it is possible to pay the fee online through a feature such as a secure payment via credit card.

B. Currently Available Browsers (QP)

There are a few popular browsers for Internet users such as Microsoft Internet Explorer, Netscape Navigator, Mozilla, Mosaic, and Lynx (Heslop and Holzgang 1998). The two most popular browsers are the Internet Explorer and Netscape Navigator. People have their own choice of using either browser because everyone has different preferences. However, there are things that might be compatible with one browser and not with the other. This can result in web sites that look different with different browsers, and loss of some content because of compatibility problems. For example, if a site contains some JavaScript code, then it may work in Internet Explorer and produce errors when executed under Netscape Navigator. Internet Explorer and Netscape usually support JavaScript but they may differ on the syntax and their respective DOMs (document object model) that is recognized and thereby creating compatibility problems.

C. Human Computer Interaction (GG)

When designing a communications interface, there are a number of factors to address. One factor to take into account is how long it will take for a typical member of the defined user community to learn how to use the commands relevant to a set of tasks. If it takes too long for the user to comprehend a function then the interface is not time effective. Speed is also a factor to consider. How long does it take to carry out the benchmark tasks? Another factor to consider is the rate of errors by the users. How many and what types of errors could be made when using the interface? The ability to handle user errors is important when designing any type of interface. If the user mistypes information or types the wrong command, the system should not crash. If you don't

write your interface properly to handle errors then your system may give you undesired results. An example of this would be submitting a web form too soon without filling out all of the proper forms. If there is no error correcting code in the interface, then the person receiving the form may receive empty fields. The final factor to consider is overall user satisfaction. Did the users like using the various aspects of the system, if so, how much?

Although success in all of these categories would be advantageous, it is essentially impossible to meet all of these needs. There are tradeoffs that must be considered. If given lengthy learning time, task performance times could be reduced by not having script controllers, implementing macros, and shortcuts. Basically, this means that removal of the script controllers would assume the user always types in the correct information and never leaves anything blank. It would also assume that the user is always honest and wouldn't take advantage of the fact that errors wouldn't be handled properly and that intentional crashing of the system would not be exploited. If complex macros and shortcuts were always used, this would assume the user had an extensive knowledge of how the interface was programmed. This would be unrealistic for anyone other than the programmers themselves and teaching it to the average user wouldn't be time-effective. If the rate of errors is to be kept low then speed may have to be sacrificed. This also has an effect on overall user satisfaction. Thus, in developing a website, all of these issues should be taken into account. Using a simple, easy to use and understand interface with basic JavaScript controllers should yield optimal results (Shneiderman 1998).

III. Project Goals (QP)

A. Create a web site

We want to create a web site for PUI's that are in the northeast region. This web site will serve as a model for other regional ASPP groups in developing a communication device for all PUI faculty and students.

B. Contents of the web site

The site should have enough information so that people can look up upcoming events and possible speakers. It should also have all the links to PUI's and other organizations with contact information.

C. Ease of use

We want to have a web site that everyone would be able to use without any problem. It should be straightforward with clear information. There are a lot of sites on the web that are difficult to browse because they are disorganized or not well developed.

IV. Methodology (GG)

A. Preparatory Work

Preliminary research for this project included studying how to do data analysis and the development of websites. Guides to HTML (hypertext markup language), Javascript, and demographic statistics were used. The emailing list for the northeast section of the ASPP was also acquired from Professor Weathers and contact with the ~~ASPP~~ WPI Webmaster, Amy Marr, was made.

B. Development of Pre-survey (GG)

The development of the pre-survey consisted of a 12 question form about desired website content (see Fig. 1.1). This pre-survey was sent out to a small test group of 10 people who comprise the PUI working group and its purpose was to get an idea of the needs of the PUI community. The data returned from this pre-survey gave us useful information in the development of a survey that was intended for review by the regional membership. The pre-survey was modified to reflect the suggestions of the respondents and to have more detailed questions about the community's needs as well as demographic information (See Fig. 1.2).

Figure 1.1: Pre-survey

The site should contain

1. Updated information about PUI events such as regional meetings.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

2. A listing of contact information of all PUI members.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

3. Links to other undergraduate science organizations.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

4. A feedback form.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

5. A features help section.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

6. A site map for navigation.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

7. A real-time chat room for communication among faculty.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

8. An archive of pertinent PUI documents or presentations (e.g. summer fellowships program rules and online submission form).
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

9. A listing of potential seminar speakers willing to go to PUI schools, suggested topics, and any expected fees from and for PUI's.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

10. A listing of contact information about all PUI institutions.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

11. A list of potential manuscript PUI reviewers for the major ASPP journals.
A)Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

12. Any other comments, suggestions, or feedback:

Figure1.2: Final Pre-survey

The site should contain

1. Updated information about PUI events such as regional meetings.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

2. A listing of contact information of all PUI members.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

3. Links to other undergraduate science organizations.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

4. A feedback form.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

5. A site map for navigation.
A) Strongly Agree
B) Agree
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6. A real-time chat room for communication among faculty.
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Comments:

7. An archive of pertinent PUI documents or presentations (e.g. summer fellowships program rules and online submission form).
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

8. A listing of potential seminar speakers willing to go to PUI schools, suggested topics, and any expected fees from and for PUI's.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

9. A listing of contact information about all PUI institutions.
A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

10. A list of potential manuscript PUI reviewers for the major ASPP journals.
A)Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

11. Any other comments, suggestions, or feedback:

C. Website Development (GG)

The website was developed based on the responses received from the NEASPP survey group. After considering the responses and narrowing down the content needed, a design layout was established. The next step was to obtain access to a web directory on WPI's server. WPI's Webmaster, Amy Marr, was contacted in order to allocate a separate folder for web development. Once access to this folder was granted, the HTML was written. Using a generic text editor, the HTML contained the information useful to the PUI members.

Javascript was used in the completion of all of the feedback forms used in the site. The code was implemented to make sure that users didn't leave any of the fields blank. If any of the fields were left blank, an alert prompt would pop up informing the user that they must finish the form (Webmokey)

D. Post web site survey (GG)

The post web site survey was developed to determine the success of the website (See Fig. 2.3). User satisfaction was measured based on a numerical analysis of the data collected and the website design was adjusted based on the summary critique. The post web site survey was implemented on the main page using a form in HTML along with two different Javascript functions and event handlers (Webmonkey). The first, which was implemented in all of the other forms, was the form complete function that wouldn't allow the user to leave any field blank. This function is called in every instance of the onSubmit event handler to verify the user's input before it is submitted to the server. The second function was the onUnload event handler that would popup the post survey after

the user would leave the site or hit the back button. Therefore, this would allow the user to check out the whole site beforehand and remind them to fill out the survey afterwards.

E. Data Analysis (GG)

Analyzing data was a critical component in this project. The existence of data in its raw collected state has very little use without some sort of processing. Examples of this are the answers to survey data that are collected from the PUI working group and the regional PUI members. If no further examination of the survey answers were undertaken, we wouldn't know how to create a site to effectively suit their general needs and user satisfaction would most likely have been at a minimum level.

In order to properly analyze the data, we needed to find tools that would assist us in this task. The main tool we used for analysis was Microsoft Excel 2000. Microsoft Excel is a spreadsheet program. Excel was used to organize, manipulate, chart data, and to perform calculations. It can also be used for statistical analysis. The data we retrieved from the results of the survey was placed into its raw form categorized by each question (See Fig 1.2) (Anderson 1989).

For each question there were four possible answers, each assigned a numerical value:

- Strongly Agree = 4
- Agree = 3
- Disagree = 2
- Strongly Disagree = 1

All of these response values were entered into the spreadsheet. Using Excel, we were able to sum up each question and perform the calculation. Next, the average function was used to calculate each question's average value. From this data, we calculated the

mean, standard deviation, and the 95% confidence level of the data in order to determine the importance of each survey question. If the survey question received a response that was further than -1 standard deviations from the mean, it was discarded. If the survey question received a response that was further than +1 standard deviations from the mean, the question, it was considered a top priority. The 95% confidence level allowed us to see where most of the responses fell (Burnstien, Freeman and Rossi 1985).

Through the usage of Excel's graphical charts, we were able to get a picture of our raw data (See Fig.1.4-1.5). The first bar chart gave us a view of the total response for each question. The second chart we used focused on the individual averages, which turned out to be most useful.

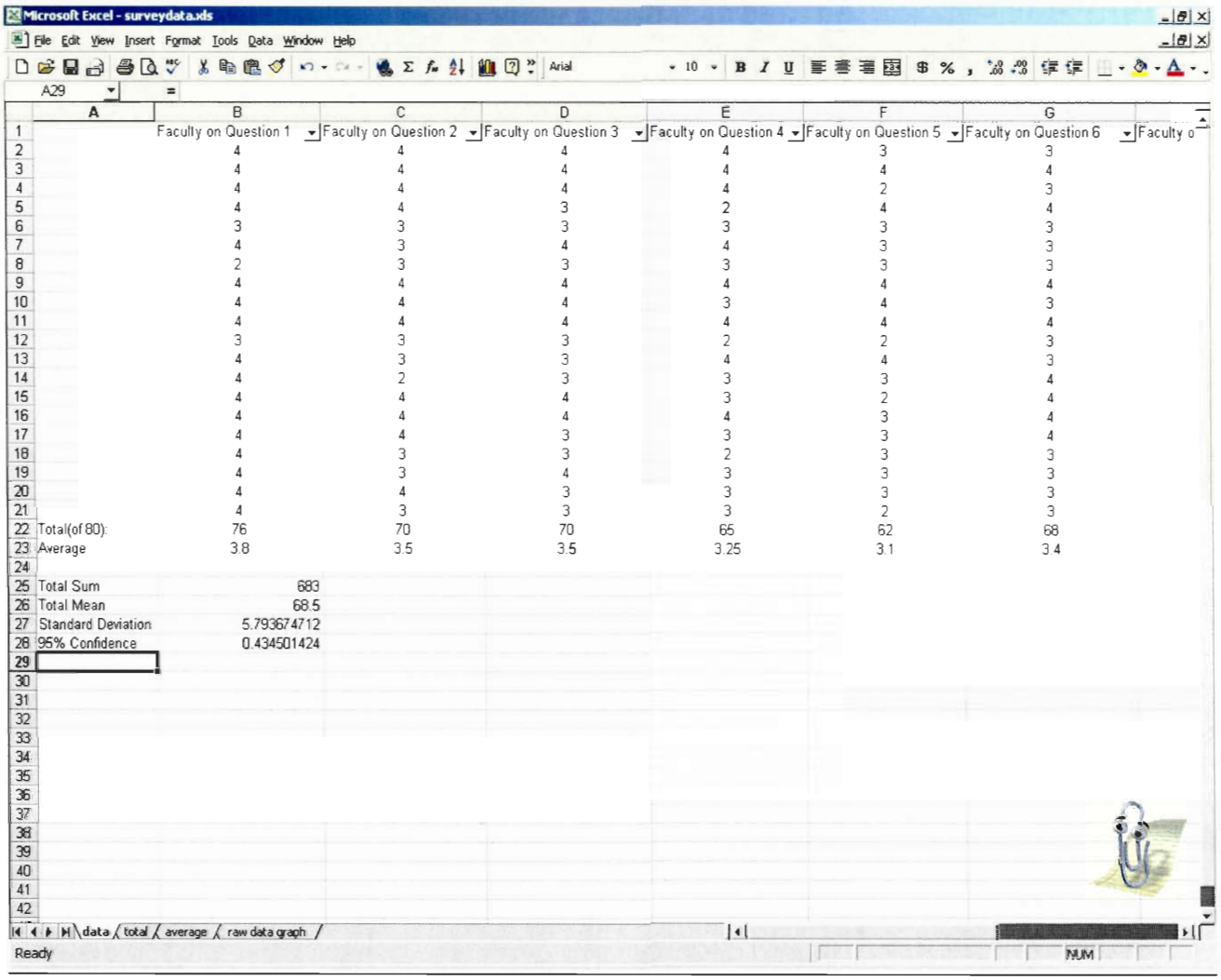


Figure 1.3 Survey Raw Data

This shows the layout of our Excel spreadsheet and what our raw data looked like. Each Question was summed up out of a possible 80 points. The average response per question was calculated. The overall sum, mean, standard deviation, and 95% confidence interval were calculated in order to assess which questions received a high enough response to be kept and which questions could be discarded.

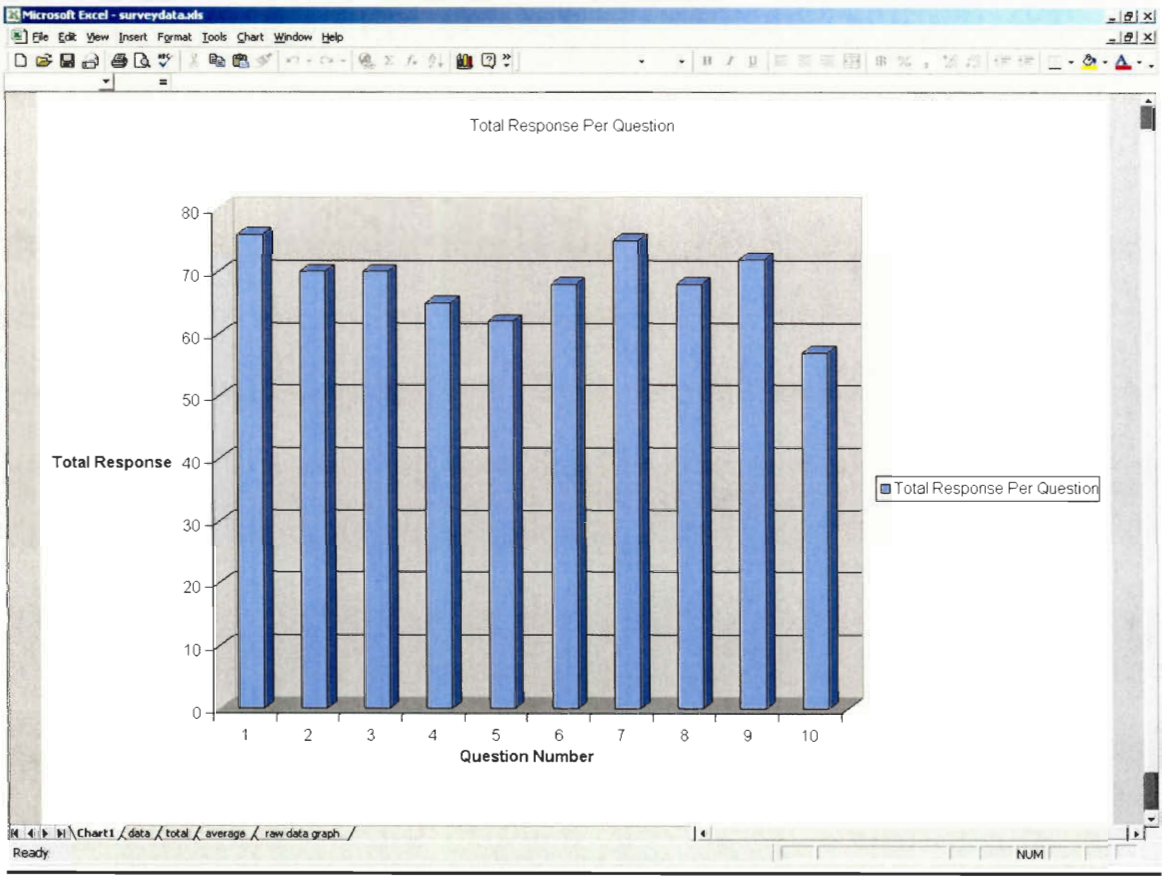


Figure 1.4 Total Response Per Question in the Actual Survey

This chart shows the graphical representation of our raw data in terms of the total point response for each question. Question 1, PUI events; Question 2, contact listing; Question 3, links to other organizations; Question 4, feedback form; Question 5, help section; Question 6, site map; Question 7, pertinent documents archive; Question 8, speaker listing; Question 9, contact information; Question 10, listing or potential reviewers

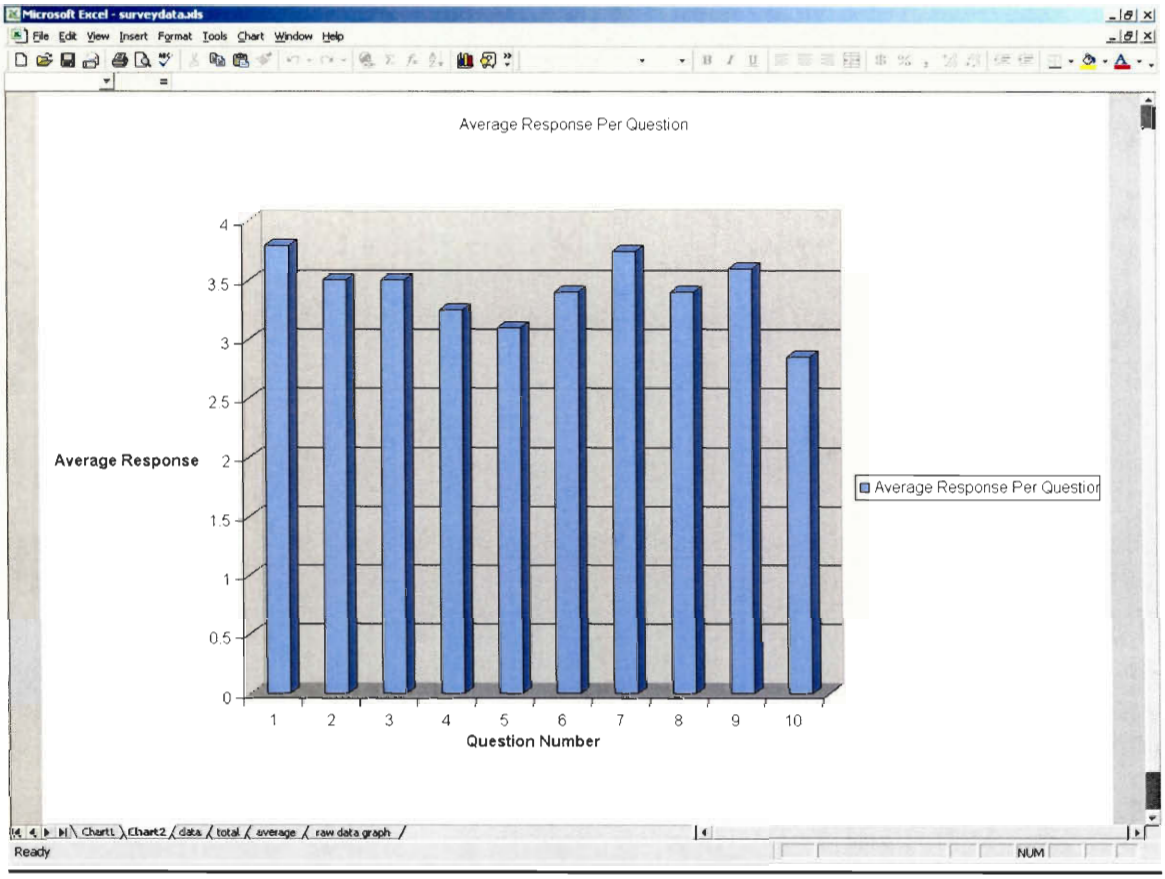


Figure 1.5 Average Response Per Question in the Actual Survey

This is an Excel chart showing the results of the survey in terms of the average point value. Question 1, PUI events; Question 2, contact listing; Question 3, links to other organizations; Question 4, feedback form; Question 5, help section; Question 6, site map; Question 7, pertinent documents archive; Question 8, speaker listing; Question 9, contact information; Question 10, listing or potential reviewers

V. Results (QP)

A. Pre Survey (QP)

The pre-survey was sent out to a small group of members from the northeast section. The group has about ten members. We only received responses from three people. The results varied among the three respondents. All three respondents disagreed on question number 7. Question number 7 regarded a chat room for the web site.

When the results of the pre survey were analyzed, only one question was eliminated from the survey. This question was eliminated because it wasn't deemed by the pre-survey respondents to be necessary for this type of web site. Also, a chat room required more complicated technology and would likely have made the site too difficult for the users. For the rest of the questions on the survey we decided not to eliminate any of them because they had different responses from each of the three respondents.

B. Survey (QP)

The final survey was created after the analysis of the pre-survey. With one question eliminated, the survey consisted of exactly ten questions. In order for us to have a good analysis on the final survey we needed to have demographic questions to go along with the survey questions. We needed the demographic information for our analysis because we wanted to know who the person was and where they came from. Then we could use that information and compare how they responded to the survey. Different groups of people might have different but unique answers to the survey. For example, the respondents of 4-year college and the respondents of PHD granting could have different opinions on certain questions. We could compare the responses from these two groups to see whether or not they had different answers and how significant of a

difference. It was difficult to determine what kind of question we should include that could give us enough information for a good analysis. After much research and discussions, six questions were determined to be important as explained below:

- Profession – this information was needed because we could use this to compare the answers from students, faculty and industry professionals.
- Age – we could determine whether or not age altered responses.
- Gender – here we could determine if males responded differently from females.
- Citizenship – this was the hard one, but we included it to see if there were any international respondents.
- Academic Institution – this category was important because the responses from mainly undergraduate institutions might be different from those of large research universities.
- Categories of research interest in plant science - we included this category to determine what different research groups may be responding to the survey; this was for general information purpose only.

After about two weeks we gathered the results from the survey. We had about a 10% response out of a 200-person group. The expected average results via email were estimated at 40%-50% (Weisberg, Krosnick and Bowen 1996). This was not a good response because we didn't have enough data to analyze differences between the six demographic questions. Twenty surveys were deemed fully completed and all of these came from faculty. This made it easy for us to analyze the data, Due to such a small sample size.

The overall results were separated into two groups: 4-year college and PHD Granting. This separation was the only method we could do to analyze the results. There were five respondents from 4-year college and ten respondents from PHD Granting. In the total results, there was only one disagreement on the 4-year college, which was the question number 10 regarding the list of manuscripts. On the other hand, PHD Granting had eleven disagreements in total. The disagreements were varied question to question. However, most of the disagreements were on the question about the list of manuscripts. At this point we knew that this question would not be implemented before we even calculated the results. In conclusion to the survey, the responses we got from faculties were in favor of development and contents of the web site. Question 11 was included to get other comments from respondents. However, there were too many comments came back with the survey. Some of the comments we got were encouragement to the process of the web site and approval of the contents on the site.

C. Website Layout (GG)

The site consisted of an Events link that took users back to the main events listing on the ASPP website. The site also had a List of Institutions in the ASPP that were PUI's with a contact from the respective school. An Undergraduate Research and Funding Resources section was also put up to provide users with links to important funding and other relevant resources specific to PUI's. A PUI Speaker Listing was also included along with a form to allow users to add themselves as a speaker or add their school to the PUI Institution list. Finally, a feedback form was posted to allow users to add their feedback to the Webmaster.

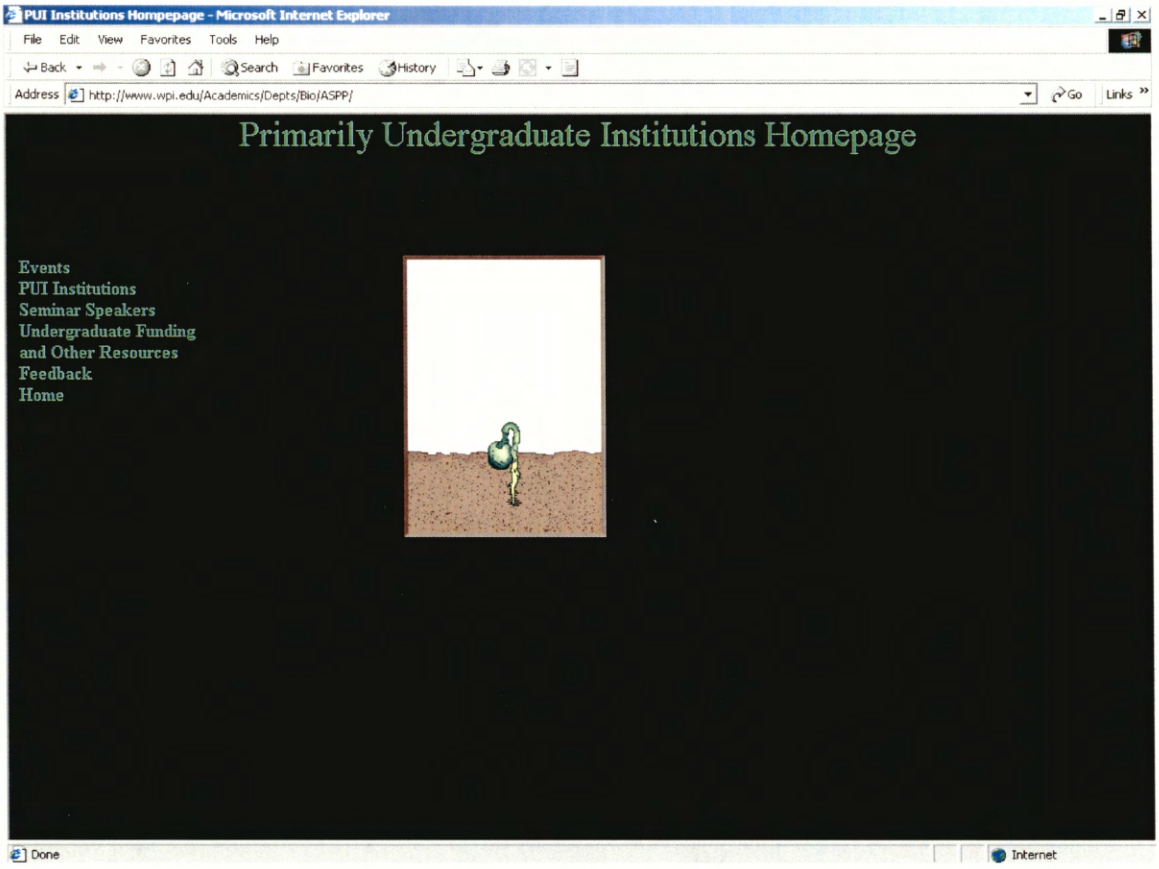


Figure 1.6 Primarily Undergraduate Institutions Homepage

This is the site's homepage. It consists of three separate frames. The left frame contains the links, the top frame contains the title of the page, and the third frame is used to display the contents of the current link. The picture on the main page is an animated gif provided by Trung Tran. This particular design with frames was implemented to help minimize maintenance and provide better organization.

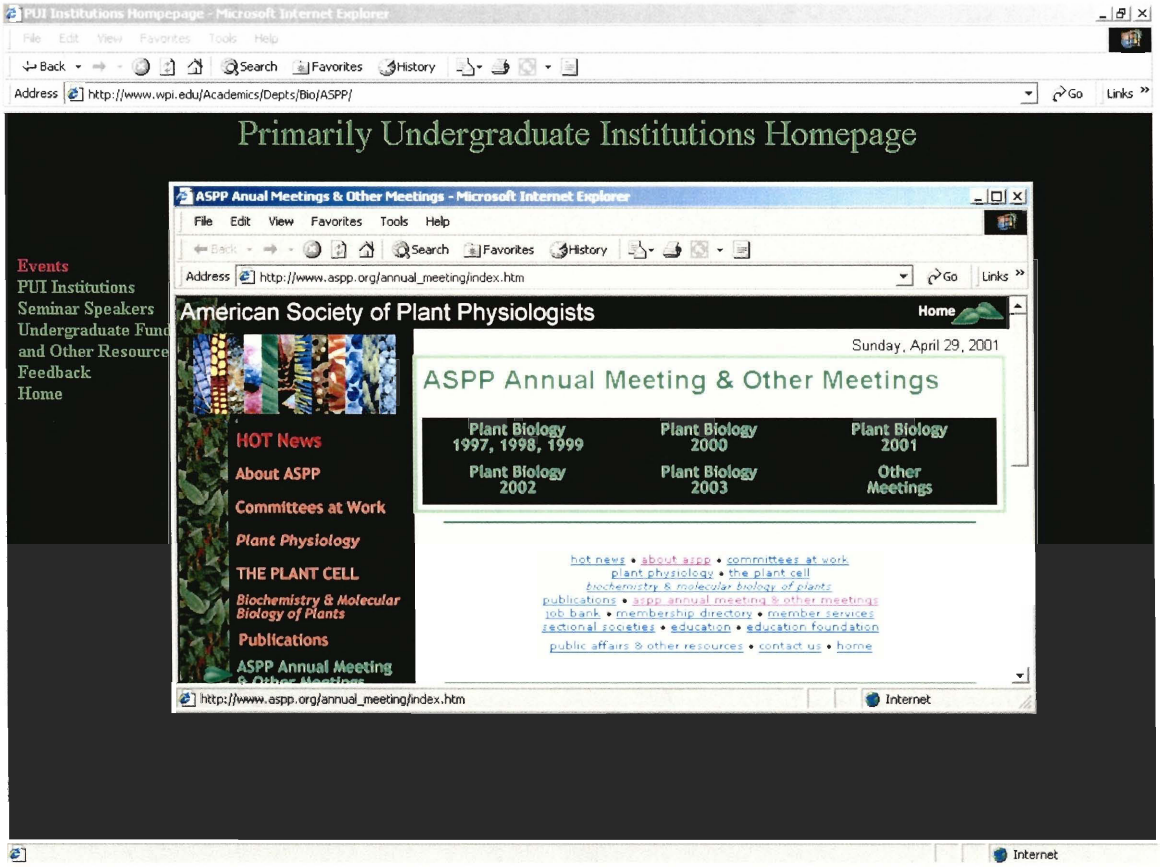


Figure 1.7 Primarily Undergraduate Institutions Event Listing

This is the events link that connects you back to the main ASPP events page. Currently, there are no special undergraduate events listings. This is due to the fact that not enough events are currently listed that only apply to undergraduate institutions.

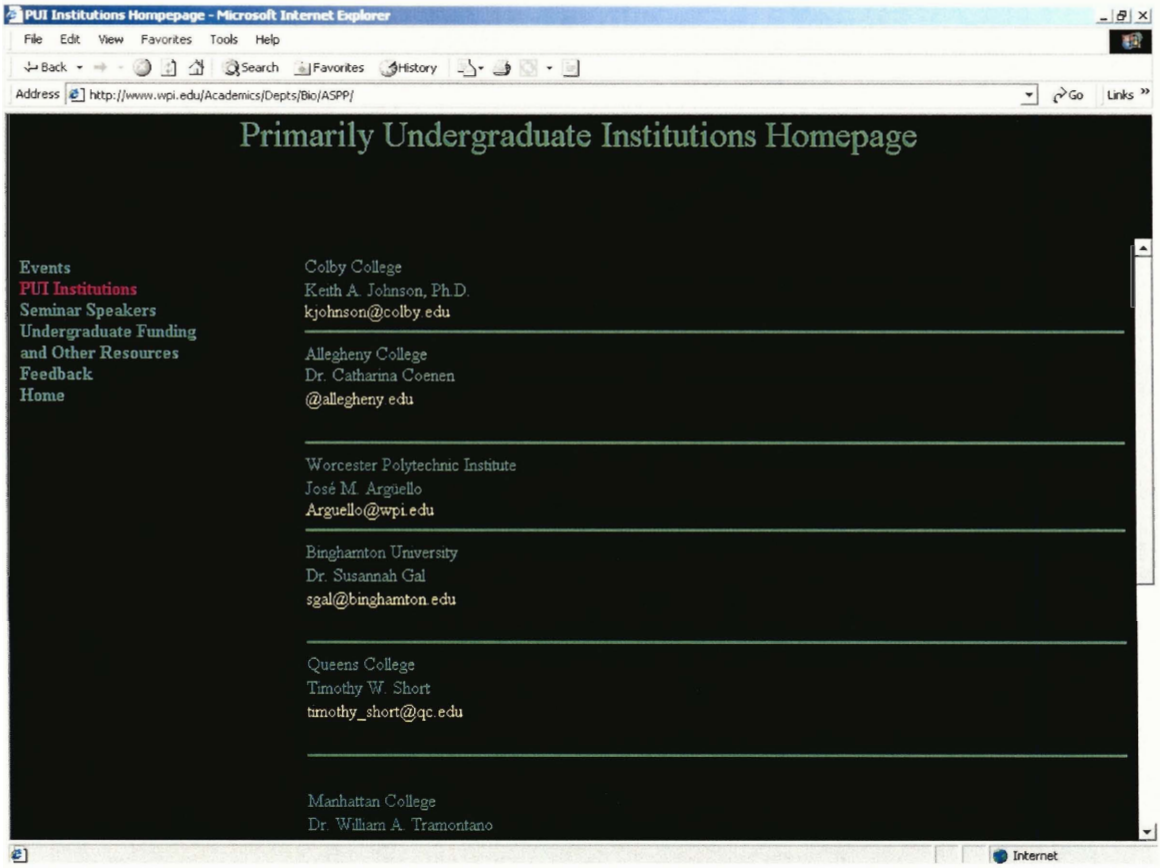


Figure 1.8 Primarily Undergraduate Institutions Listing

This is the Institutions link, which lists PUI's that have submitted their Institution to the site. It also includes a person's contact information. Currently, these contacts contain people from PUI's in the northeast region.

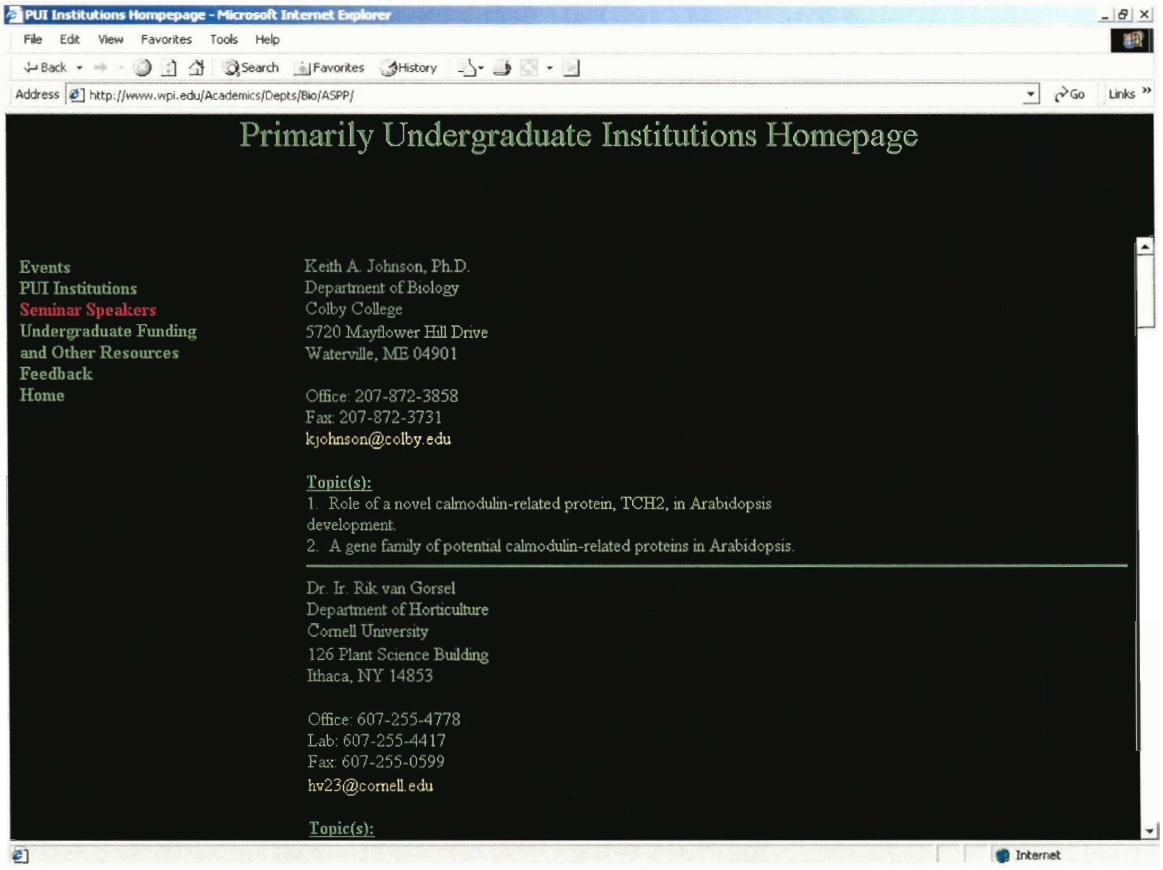


Figure 1.9 Primarily Undergraduate Institutions Speakers Listing

This is the Seminar Speakers link. It includes a list of people who have submitted their names to the site with contact information and possible topics they can speak about at PUI's. Currently, the listing has 15 people from varying universities in the northeastern region.

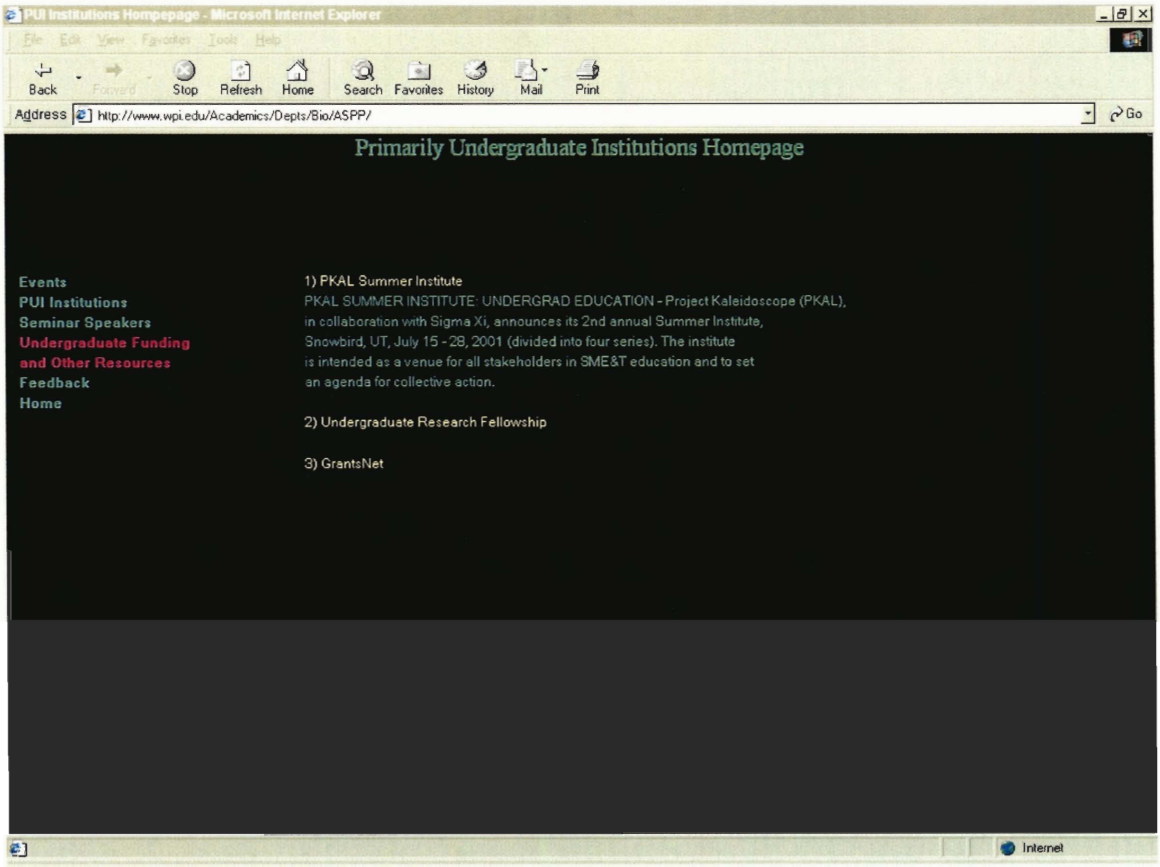


Figure 1.10 Primarily Undergraduate Institutions Funding and Other Resources

The Undergraduate Funding and Other Resources link contains relevant resources for PUI's that focus on fellowships and other funding links.

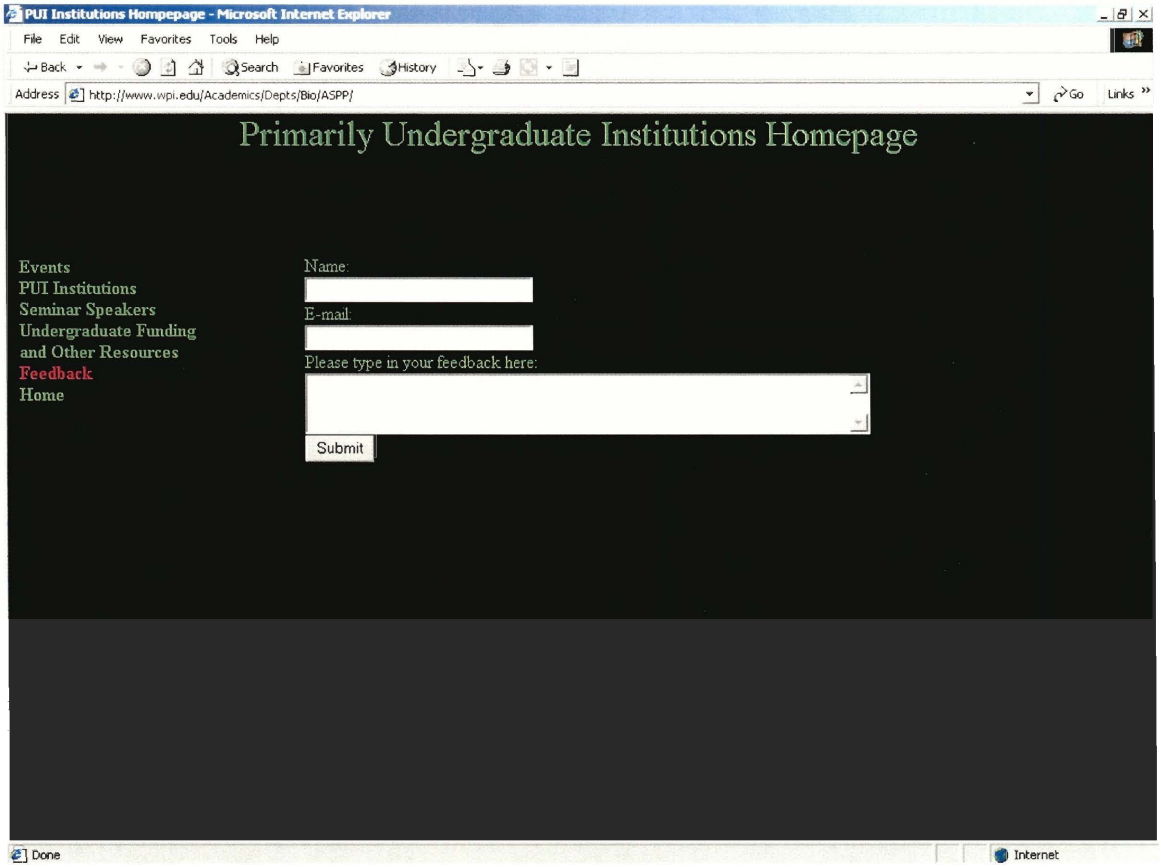


Figure 2.0 Primarily Undergraduate Institutions Feedback

The feedback link contains a submittal form that sends email to the Webmaster about possible suggestions, recommendations, or general concerns that a user may have.

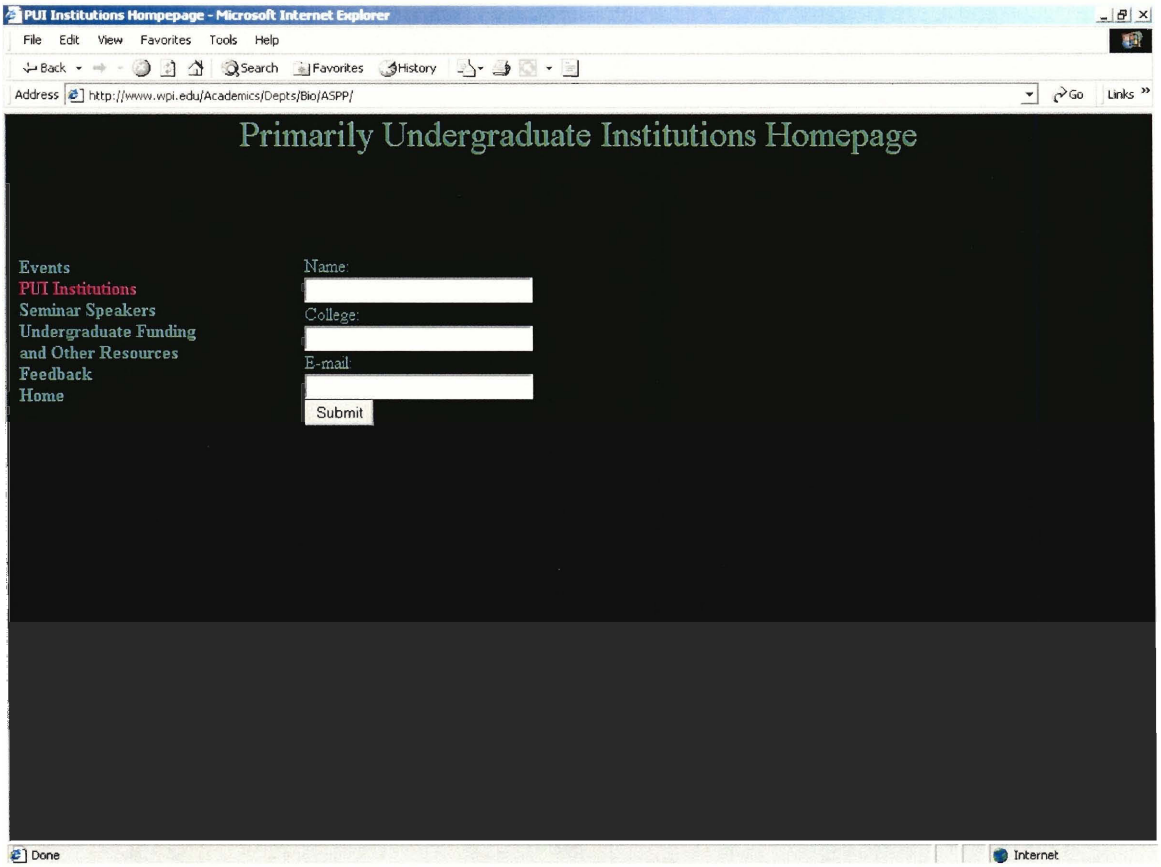


Figure 2.1 Primarily Undergraduate Institutions Submittal Form

This form is for adding a PUI to the list on the site and emails the Webmaster with the appropriate information to make the changes. In order to remove or change your listing, one must submit the feedback form and have the Webmaster make the appropriate changes. If a non-PUI member attempts to add their name then the Webmaster must regulate the submittals.

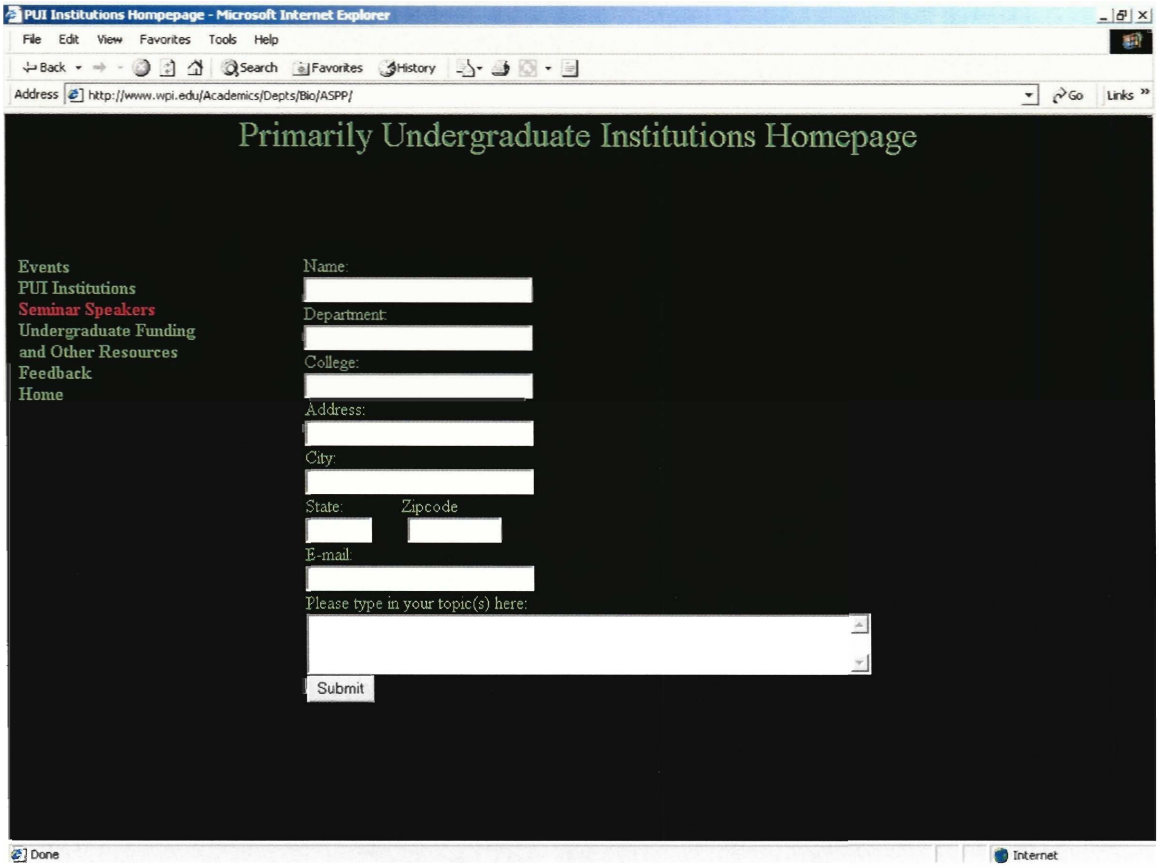


Figure 2.2 Primarily Undergraduate Institutions Speaker Submittal

This form is the add-a-speaker form, which allows a potential speaker to list him or herself onto the Seminar Speakers link. Currently, the speakers are not grouped and there is no site search implemented.

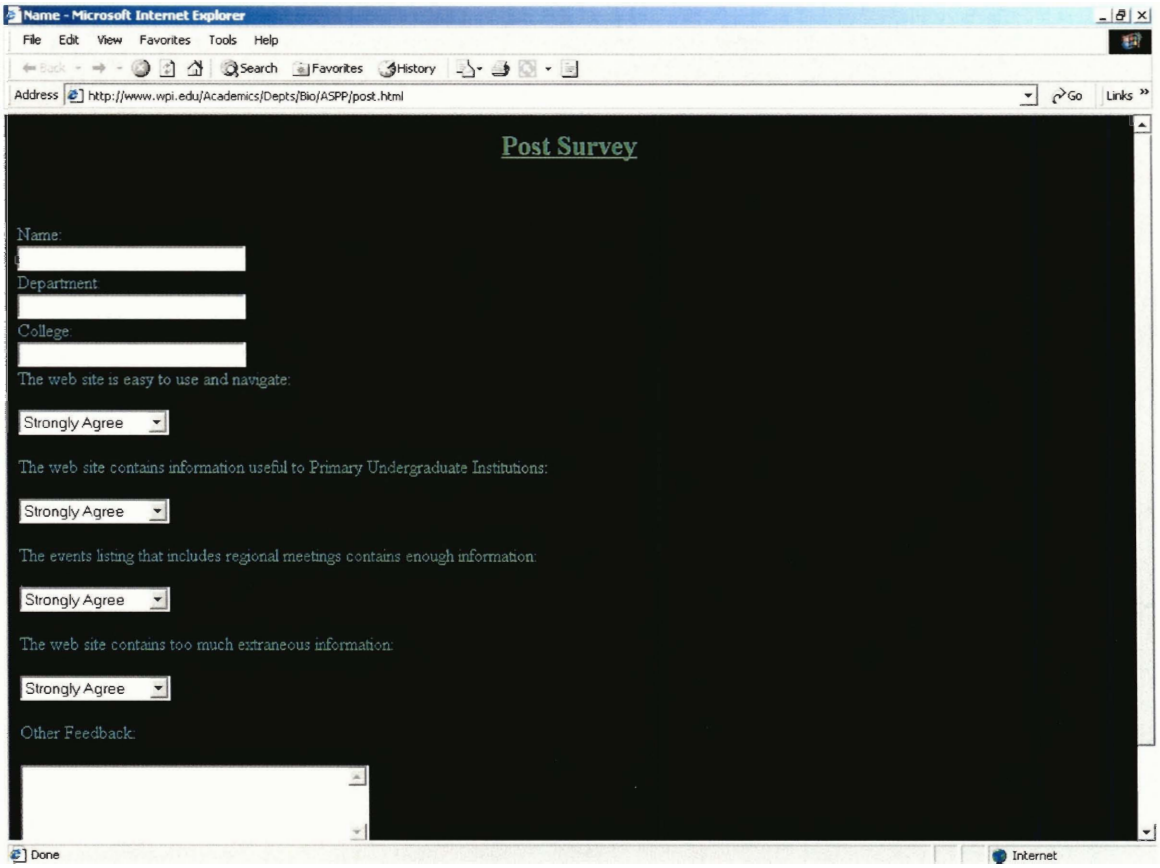


Figure 2.3 Primarily Undergraduate Institutions Post Survey

This is the Post Survey form that pops up when the user leaves the site. It contains some general questions about the user satisfaction with the site content. This is only a temporary form used with the site to gather data for analysis.

D. Post Survey (GG)

The post survey was designed the same manner as the pre survey. The survey was posted on the web site for the reviewer of the web site to fill out. The difference with this survey was that demographic information wasn't included. The reason for this is that the post survey was created to determine the success of the web site and for future adjustment to the site as explained in the methodology section. The post-survey yielded 11 responses to each of the four questions. Based on the responses, user satisfaction seemed to be close to optimal. Question one through three each yielded a high score near the strongly agree area. Question four had a score near the strongly disagree area. Since the first three questions were asked the user if they were happy about certain aspects of the site, a high score meant the site was doing a good job. Question four asked if the user thought there was too much information on the site and therefore having a score closer to the strongly disagree area meant a positive response.

E. Web site adjustment (GG)

The web site needed some adjustments and maintenance. These included adding or modifying the speaker listing, the Institution listing, and the general site layout. The speaker listing had a few names to add to the list, which consisted of some PUI faculty but also some faculty from larger research Universities in the ASPP wanting to speak at PUI's. The general site layout had to be changed a few times in order to keep things

organized. Originally the site used tables but was later modified to simplify the layout using three separate frames instead.

F. Web site management issues for consideration (GG)

In order for this site to be effective, it must be maintained. Some issues to take into consideration are the CGI (common gateway interface) script, keeping the site updated, and checking up on the feedback forms. The CGI script used is a basic email script written in the Perl (practical extraction and report language) and allows the user to send email to the Webmaster or any other email address specified. The benefit of this is that it uses a simple form and is easier for a user to send (IBM). To maintain this, the ASPP Webmaster must have their own script pointed to, since the one currently implemented will only send email to people inside the WPI domain. They must point to this script from the feedback form, the add a speaker form, and also the add an institution form. Keeping the site updated is also important in maintaining the site. Speakers can change their topics or ~~wish to~~ be removed or added to the speaker list. People wishing to add their PUI to the current list may request it through the add an institution form. General feedback about site suggestions, changes, or misrepresentation of information may also be sent through the general feedback form. In order to keep up with this, the Webmaster must keep up to date with the emails sent via the CGI script.

VI. Conclusions and Recommendations (GG)

Our project takes advantage of the Internet and specifically the World Wide Web. This is one of the most effective means of communication in the world today. Based on our data analysis from the surveys, we created a web site for PUI's that are in the northeast region. Our site proved to be successful in its purpose based on our feedback and post-survey. The site will be an important first step and serve as a paradigm for linking all of the other regional ASPP groups in developing a communication device for all PUI faculty and students.

Some future recommendations would be to make the site more automated and to contain more content. With the advent of more technology such as PHP (pre-processor hypertext) and MySQL (a free database program) one could make the site more interactive and maintenance free (Webmonkey). The users could enter in their information on the forms and have the web site automatically update itself instead of the Webmaster typing in this information manually. The site could also contain it's own events listing since the link to the ASPP doesn't contain very much information.

APPENDIX A: MISSION AND ORGANIZATION OF ASPP (QP)

The American Society of Plant Physiologists was founded in 1924 to promote the growth and development of plant physiology, to encourage and publish research in plant physiology, and to promote the interests and growth of plant scientists in general. Over the decades the Society has evolved and expanded to provide a forum for molecular and cellular biology as well as to serve the basic interests of plant science. It publishes the highly cited and respected journals Plant Physiology and The Plant Cell. Membership spans six continents, and their members work in such diverse areas as academia, government laboratories, and industrial and commercial environments. The Society also has a large student membership. ASPP plays a key role in uniting the international plant science disciplines (ASPP web site).

APPENDIX B: PRE-SURVEY AND RESULTS (QP)

Introduction:

Greetings. We are conducting a survey for a Primarily Undergraduate Institution (PUI) web page that will be a link on the ASPP website. The survey below contains suggestions as to the content of such a page and asks for your feedback. This is a preliminary survey and we would like to ask you to comment on the types of questions we are going to ask of a larger ASPP population. Please return your comments no later than January 23, 2001. Thank you.

Pamela Weathers, Professor, Worcester Polytechnic Institute

Gregory Gimler, Student, Worcester Polytechnic Institute

Quan Pham, Student, Worcester Polytechnic Institute

PUI Web Site Survey

The site should contain:

1. Updated information about PUI events such as regional meetings.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

2. A listing of contact information of all PUI members.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

3. Links to other undergraduate science organizations.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

4. A feedback form.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

5. A help section for the site.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

6. A site map for navigation.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

7. An archive of pertinent PUI documents or presentations (e.g. summer fellow program rules and online submission form)

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree

Comments:

8. A listing of potential seminar speakers willing to go to PUI schools, suggested topics and any expected fees from and for PUI's.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

9. A listing of contact information about all PUI institutions.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

10. A list of potential manuscript PUI reviewers for the major ASPP and other plant science journals.

A) Strongly Agree
B) Agree
C) Disagree
D) Strongly Disagree
Comments:

11. Any other comments, suggestions, or feedback:

Results:

1	2	3	4	5	6	7	8	9	10
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Agree	Agree	Agree	Disagree	Agree	Agree	Agree	Agree	Agree	Agree
Agree	Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree
Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree	Agree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree
Agree	Agree	Agree	Disagree	Disagree	Agree	Agree	Agree	Agree	Disagree
Strongly Agree	Agree	Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree
Strongly Agree	Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Disagree	Strongly Agree	Agree	Agree	Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree
Strongly Agree	Strongly Agree	Agree	Agree	Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Disagree
Strongly Agree	Agree	Agree	Disagree	Agree	Agree	Strongly Agree	Strongly Agree	Agree	Agree
Strongly Agree	Agree	Strongly Agree	Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree
Strongly Agree	Strongly Agree	Agree	Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree
Strongly Agree	Agree	Agree	Agree	Disagree	Agree	Agree	Disagree	Disagree	Disagree

APPENDIX C: POST-SURVEY AND RESULTS (QP)

Questions:

1. The web site is easy to use and navigate
2. The web site contains information useful to Primary Undergraduate Institutions and other users
3. The events listing that includes regional meetings contains enough information
4. The web site contains too much extraneous information

Results:

Question 1	Question 2	Question 4	Question 5
Strongly Agree	Strongly Agree	Strongly Agree	Disagree
Agree	Agree	Disagree	Disagree
Agree	Agree	Agree	Disagree
Agree	Agree	Strongly Agree	Disagree
Agree	Strongly Agree	Agree	Disagree
Strong Agree	Strongly Agree	Strongly Agree	Disagree
Strongly Agree	Strongly Agree	Agree	Strongly Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree
Strongly Agree	Strongly Agree	Agree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree
Strongly Agree	Agree	Agree	Disagree

APPENDIX D: SYSTEM AND SOFTWARE USED (QP)

Test Platforms:

- Intel based PCs
- Digital Unix machines

Operating Systems:

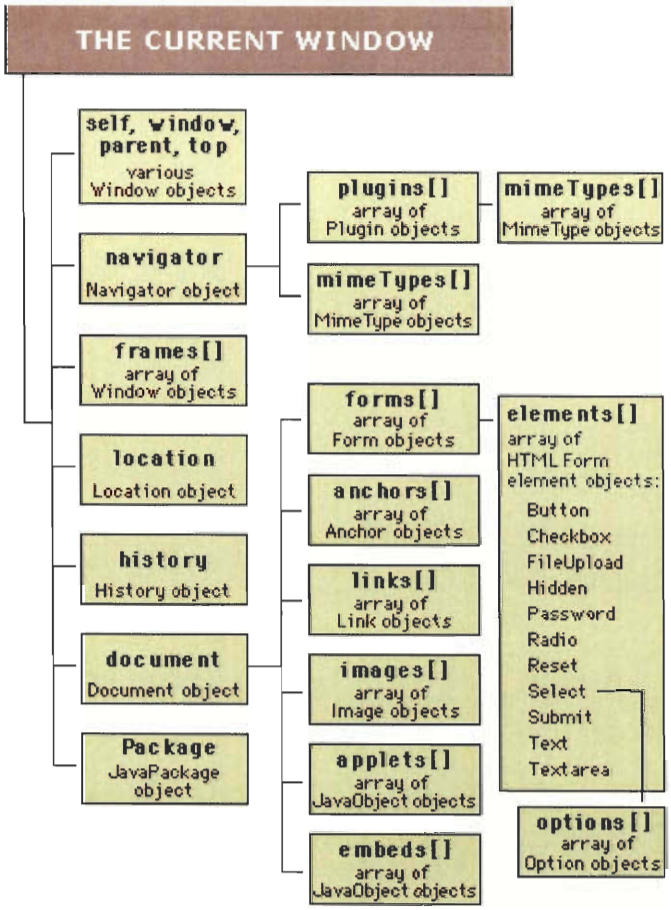
- Windows 98/2000
- Unix

Applications Used:

- Microsoft FTP and Telnet
- Microsoft FrontPage
- Microsoft Word
- Microsoft Excel
- Microsoft Internet Explorer
- Netscape
- Unix Pico and Vi

Programming Language Used:

- HTML
- JavaScript
    - Document Object Model


THE CURRENT WINDOW
self, window, parent, top
various Window objects
navigator
Navigator object
frames[]
array of Window objects
location
Location object
history
History object
document
Document object
Package
JavaPackage object
plugins[]
array of Plugin objects
mimeTypes[]
array of MimeType objects
mimeTypes[]
array of MimeType objects
forms[]
array of Form objects
anchors[]
array of Anchor objects
links[]
array of Link objects
images[]
array of Image objects
applets[]
array of JavaObject objects
embeds[]
array of JavaObject objects
elements[]
array of HTML Form element objects:
Button
Checkbox
FileUpload
Hidden
Password
Radio
Reset
Select
Submit
Text
Textarea
options[]
array of Option objects

APPENDIX E: WEB PAGES USED FOR TESTING (QP)

The web site we used to test the site is under this address:

http://www.wpi.edu/+Bio/ASPP

The web master of WPI assigned this account to us. It is allocated under the department of Biology. We have full access to this account. After this web site is completed, it will be hand over to the ASPP web master so the ASPP can maintain it.

GLOSSARY (QP)

Browser - A program that fetches and interprets HTML documents from the World Wide Web and displays them for the user.

Cascading Style Sheets (CSS)- CSS is a method of separating style from content in your HTML documents.

Common Gateway Interface (CGI) - a standard for programs to interface with information servers such as HTTP (web) servers. CGI allows the HTTP server to run an executable program or script in response to a user request, and generate output on the fly. This allows web developers to create dynamic and interactive web pages.

Electronic Mail (E-mail) - A form of communication, which allows a user to send messages via Internet.

File Transfer Protocol (FTP) - A communications standard for transferring files over the Internet.

Form - User input area on a Web page.

Hypertext Mark-up Language (HTML) - It's a simple, universal mark-up language that allows Web publishers to create complex pages of text and images that can be viewed by anyone else on the Web, regardless of what kind of computer or browser is being used.

Internet - A Global network of computers that contains large amounts of information on almost any subject.

JavaScript - A scripting programming language use for web site design.

Link - A section of a Web page that when activated will load another document on the World Wide Web.

MySQL - MySQL is a multi-user, multi-threaded SQL database server. It is lightweight, fast, and robust. It is available for free for most non-commercial uses and is an inexpensive server for commercial uses.

Perl - It is an interpreted high-level programming language developed by Larry Wall. According to Larry, he included in Perl all the cool features found in other languages and left out those features that weren't so cool.

PHP- It is what is known as a server-side scripting language. When a user looks at a WWW page that is a PHP page, the server gets a PHP interpreter to examine the page. The PHP interpreter will generate some HTML, which is then shipped by the WWW server and is interpreted by the user's WWW browser.

Windows - A graphical user interface for PC compatible machines, written by Microsoft.

World Wide Web (WWW) - A global network of documents interconnected by Hyper Text links.

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