Bugwood - The Web Site and The Concept

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Abstract:

The Bugwood Work Group was formed in 1995. Its mission is to gather, create, maintain, promote the use of, and economically distribute digital information both as resources and as tools to enhance and complement information exchange and educational activities. The Work Group originally focused in the areas of entomology, forestry, forest health and forest IPM relating to Georgia and the Southeast United States. The Bugwood web site was created to support these areas. This web site quickly grew and became a framework, which related sites, and subject areas have "plugged" into. The Bugwood Network of web sites now consists of twelve different sites with emphasis on insects, diseases, weeds, forestry, agroforestry, agriculture, integrated pest management and information technologies in North America, Africa and other locations across the world. The Work Group is now creating new materials as well as converting existing materials for use on the web. An archive of over 6500 high-resolution PhotoCD-level images has been built to support the different web sites and projects of the Work Group. This archive will soon be made available via the Bugwood Network. The Bugwood Work Group expands the traditional definition of Extension to a global audience through use of the World Wide Web.

What is Bugwood?

Bugwood is a network of closely related web sites focused in the areas of agriculture, forestry, entomology, integrated pest management, invasive species and promoting the use of information technologies in these areas. It is a joint project between the University of Georgia College of Agricultural and Environmental Sciences and Warnell School of Forest Resources with support from the USDA Forest Service and USDA Animal and Plant Health Inspection Service. The Bugwood web site began in 1996 to help promote the PhotoCD image products and to host Work Group publications. Over the next few years, the Work Group began to develop custom content for the site and began to repurpose existing materials. Bugwood also hosts the Southern Forest Insect Work Conference site for its yearly conference and has since expanded to host web sites for the Southeast Exotic Pest Plant Council, the Georgia Exotic Pest Plant Council and the Georgia Entomological Society. Specific sites have been developed to host individual subject areas as well as work in East Africa and the South Pacific. Bugwood has recently taken over hosting and development for the University of Georgia Department of Entomology web site. The philosophy of the Network is the coming together of various disciplines and technologies working together toward a common goal.

The Work Group?

Drs. Keith Douce and David Moorhead formed the Entomology and Forest Resources Digital Information Work Group (now The Bugwood Work Group) in 1995. Dr. Douce is a Professor and Extension Entomologist in The University of Georgia, College of Agricultural and Environmental Sciences. His responsibilities include forest entomology, integrated pest management and coordinator for the USDAAPHISPPQ sponsored Cooperative Agricultural Pest Survey program. Dr. David Moorhead is a Professor and Extension Forester at The University of Georgia, Warnell School of Forest Resources. His responsibilities include forest regeneration, silviculture, forest management, prescribed fire, forest herbicides, forest IPM, and until recently, Christmas tree production. As Extension

specialists, they provide educational information and training for Extension agents, landowners, foresters, and resource managers. The Work Group consists of Drs. Douce and Moorhead, computer specialists, and secretarial support. Work Group activities include development of projects using multimedia, web sites, and computer imagery to enhance their work in entomology and forestry education.

The mission of the Work Group is:

> *to gather, create, maintain, promote the use of, and economically distribute digital information both as resources and as tools to enhance and complement information exchange and educational activities primarily in the fields of entomology, forestry, agriculture, integrated pest management, forest health and natural resources.*

The primary objectives of the Work Group are:

- The Acquisition and Creation of Original Materials
- The Conversion of Materials to Consistent Forms and Formats
- The Organization and Maintenance of the Collection
- The Distribution of Materials

Bugwood: The Web Site

Bugwood now consists of twelve unique, but related, web sites/URLs to break the content up into logical sections. The current web sites are as follows:

- The Bugwood Network Home – the "portal" into the network
  http://www.bugwood.org/ and http://www.bugwood.caes.uga.edu/
- The Georgia Integrated Pest Management Network – commodity-based pest management and identification. http://www.gaipm.org/
- The Georgia Cooperative Agricultural Pest Survey Site – fact sheet based information related to invasive species of importance to U.S. agriculture and forestry. http://www.gacaps.org/
- The Southern Forest Insect Work Conference – updated yearly to support the work conference activities. http://www.sfiwc.org/
- The Georgia Entomological Society – supports activities and publications of the society.
  http://www.gaentsoc.org/
- Southeast Exotic Pest Plant Council – the information center for the council and its members.
  http://www.se-eppc.org/
- Georgia Exotic Pest Plant Council – the information center for the council and its members.
  http://www.gaeppc.org/
- Africa – Forestry, Agroforesty, and Environment - to promote the protection, health and substainability in African forests, agroforests and forest environments
  http://www.afae.org/
- Eastern Arc Mountains Information Source– to provide information and coordination for institutions and organizations working in the forested systems of the Eastern Arc Mountains of Kenya and Tanzania, Africa supported by the USDA Forest Service and USAID.
  http://www.easternarc.org/
- Tree Pest Management Network – to support the African Tree Pest Management Project.
  http://www.atpmn.org/
- UGA Department of Entomology – the department web site. http://www.ent.uga.edu/
- Pacific Islands Regional Forestry Programme – to provide information and coordination for institutions and organizations working in forestry in the Pacific Islands as a prototype in cooperation with the Secretariat of the Pacific Community. http://www.spcforests.org/

These sites combine to include over 3,000 individual html pages and average over 150,000 hits each month. To complement the web sites and other Work Group activities an image archive of over 6,500 high resolution digital images has been assembled. (see A Picture is Worth a Thousand Words but how do you find it? http://www.bugwood.org/infotech/picture.html) This archive is currently being converted to be accessed over the web through a joint project with the USDA Forest Service and the University of Georgia Distance Diagnostics through Digital Imaging project. Bugwood is also currently pursuing projects to support invasive.org (an eastern United States information source for invasive species) forestpests.org a collection of fact sheets based on US Forest Service pest lists, expanding the model developed for the Eastern Arc mountains and Pacific Islands Regional Forestry Programme into other

areas of the world, and to expand the Georgia IPM site to include areas other than entomology.

The purpose of the Bugwood Network stems from the mission statement as illustrated above. Bugwood's primary goal is to educate our clientele and students in a quality, user-friendly manner. This will extend our reach in a timely and efficient manner and use information technologies as tools to reach this goal.

Steps for Web Development

Step 1. Plan

Web site design for a small site or a larger site such as Bugwood can be broken down into six steps. The first of these steps helps to define what the site will be and plan the future steps. As described in the book Information Architecture and the World Wide Web, when designing a site for yourself or for a client, it is important to take a look at other sites on the Web. Make a list of your favorite and least favorite sites, both sites that you visit regularly and ones that their design stuck with you. The visit these sites and make notes about what works and what doesn't. This can help you determine how to make your site work for you and your audience. Always find your competitors and strive to make your site better than theirs in both design and content.

Once you have some general ideas for how and what you want your site to be now, think about what you would like your site to be a few years from now. The future of your site should drive the entire development process. Remember a site is always a work in progress, so design it with the idea the updates and redesigns should be as easy as possible. Now that you have you have considered the future of your site and your competitors, answer the following questions for use in the actual development process:

- What is the purpose of your site?
- What content will be available on your site?
- Why will people visit your site?
- How will the site be organized?
- How will users navigate your site?

Once you have answered these questions, there is one final question that should be answered, how much can you afford? No matter what your plans for the site are, a lot of web site design is controlled by costs. These costs can include personnel time, software, hardware and any outsourcing that needs to be done. A web site can cost anywhere from a few hundred to millions of dollars. Asking how much it costs to developed a web site is not the right question; the question is how much does it cost to build a web site with these features. Ask any web developer if he/she could make the site better with more money or more people, and the answer will almost always be yes.

When money is not an issue, then the other issues that limit web development are politics and lack of content. A well-funded web site can fail if a manager or administrator that doesn't understand the web put regulations that constrict the site in any way. With the Web anyone can "think" that they are experts, however very few people actually are. Web politics can be difficult because everyone views the Web and its importance differently. In the academic area, where no money is made off the Web, these politics and getting actual content can be prohibitive to development. In many cases content developers and web developers are separated. Usually content is developed for many different formats: print, CD-ROM, web, etc, thus the content can be developed without the web, but a content-driven site can not be developed without content. Planning and getting as many of these issues as possible worked out before development begins can help make a web site successful and the rest of the development easier.

Step 2. Design

Once the web site has been planned, and the logistics and politics have been worked out, it is time to dive into designing the site. Designing a site starts at the home page and interface pages. These pages set the style and tone for the entire site. Let's look at the issues that need to be addressed to determine the "look and feel" of the home page.

First, will the home page be an umbrella or portal to other site or stand-alone. Sites such as Disney's "Go.com" center around access to other sites, these sites must provide more links and options then a small site. The homepage may have hundreds of links compared to the ten or so a stand-alone site

may have. Then it must be determined whether the site is going to be database driven or static. A database driven site is more powerful and can allow for quicker updating which is important for large sites. However, static sites can allow for flexible design and make more sense for smaller sites, since they are easier to develop from start.

The web site must also establish its self and the message or "brand" it is trying to promote. This is accomplished by the style that the site displays. Style is determined by how the site is constructed and laid out on the screen. Important issues that affect style include:

- Is the navigation text-based or using graphics?
- Is the navigation centered on the top of the screen, the left side of the screen or the center of the screen?
- What font and font sizes are used?
- Are plug-ins used to view the content, such as Macromedia Flash or Shockwave for animation, or dynamic html techniques that require later browser versions?
- How are the site sections broken up, thus affecting the navigation.

ProjectCool.com, a network of web sites sharing the common belief that anyone can make a great website if given knowledge, guidance and inspiration, illustrates three ways in which a page can be positioned on the screen; *ice, liquid and jello*.   An *ice* page is stuck to the side of the window and does not increase in size or change position as the window size changes. A *liquid* page does not have a defined size and it changes to fit the windows as the window size changes. A *jello* page centers an ice page in the window. There are advantages to each of these layout types*. Liquid* is the most ideal however *jello* is the most practical since it provides the most control over layout and looks better than ice on the screen.

Design Tips

Designing a web site is both an art and a science. However, a web site is simply an interface to information, but for the design to be effective is must work well for the intended audience with style. David Siegel in his best selling book "Creating Killer Web Sites" highlights three basics for web design; Quality, Brevity and Bandwidth. Jeffery Veen also outlined web site design in his book "Hotwired Style" as:

- embrace the medium,
- degrade gracefully,
- be simple,
- be fast,
- be clear,
- master hypertext,
- follow your audience.

Based on these, other web design books and the experience of developing the Bugwood Network, the Bugwood Work Group has outlined the four S's of web design as simplicity, speed, standardization and style.

- Simplicity is the first rule, make the interface obvious, use the old rule, and keep it simple stupid. The designer should limit the users choices but make it apparent where the user should click to move to the content. Web users do not like to read, they usually just skim unless the information is exactly what they are looking for, thus use list and short phrases whenever possible.
- Even as bandwidth continues to grow, speed is still an important issue in web development.   A page must load in under 30 seconds over a modem connection or the users will move on to another site. Interface pages should load even faster because these are just steps to get to what the user actually wants, the content. The site should also limit the number of these interface pages, thus making the shortest possible path to the content.
- The web site must also be standardized; each and every page must have a consistent look and feel. It is important for the user to "feel" as if they are in a single interface and all pages are tied together. These pages should use consistent fonts, graphics and color to achieve this. Also the pages should have contact, reference and location information on each page. This includes full and accurate citations on all documents, author and contact e-mail addresses, the date in which the page was posted, and the URL of the site in which the document appears.
- Finally the designer must tie the first three S's together with a style to set it apart from other

sites. This style varies depending on what the purpose of the site is and who the site's audience is. Bugwood has developed a style using sharp graphics with bold colors as well as high quality images to give its sites a unique look.

Now that the web site has been designed it is time to actually build the site.

Step 3. Build

When building a web site a variety of tools can be use to convert your design into a working web site. "What You See Is What You Get" (WYSIWYG) tools are now available to make web site design quicker and easier. Traditionally web sites were coded using HTML tags, this is still the preferred method for some developers who argue that WYSIWYG tools do not produce "clean" code. Whichever method is used to develop the site, the building process is fifty percent interface and fifty percent content. Once the interface is designed and implemented, it is time to add content. In the academic section this content is usually publications and fact sheets developed by faculty members. When build a site the first step is to identify this content, this content is usually available in either electronic or printed format. This content should be pulled together and made available on your site. The more content available, the more users the site will appeal to and thus the more success your site will become. This content should be adapted to fit on the web site. Long documents should be broken up into smaller pages and summaries of the documents should be made available at the top of the page. Also the designer should find content available on other sites and provide links to these documents as additional resources for the users. Each of the pages should as stated above should have common navigation and should make the site identity known. The site should also incorporate a search engine, as it grows larger to provide users with an alternative method for finding information on the site.

Images are an important part of the site building process. The following tips can be used to assist in using images in your site effectively:

- Use a tool such as Adobe Photoshop 5.5 to control compression of JPEGs and number of colors used in GIFs
- Always format images to 72 dpi
- Use GIF format whenever possible, except for photographs
- Never use JPEG format for images with text
- Use the Height and Width attributes of the image tag in the HTML code
- Layout the entire page in one file and reduce colors to limit the overall colors for the page.

The Bugwood Work Group uses many tools to develop its network of sites. Primarily the Work Group relies on NetObjects Fusion as the primary development tool. Microsoft Frontpage and the Microsoft Office suite also provide features needed for the site development. Adobe Pagemaker combined with Adobe Acrobat are used to create the printable "pdf" version of the documents on the site. Adobe Photoshop is used to size and compress the graphics and photos used on the network of sites. On the backend Microsoft Windows NT server is the platform in which the web site is served from. Allaire ColdFusion server is used to connect to Microsoft Access and Microsoft SQL Server for database applications. Microsoft Site Server acts as the search engine and site analysis tool. Bugwood is not stating that these tools are the best for web development, we have just found they work best in our situation.

Step 4. Test

The final step before making a web site "live" to the public is to test the site. Testing must be done on as many configurations as possible. The site should be tested on the major browsers, currently Microsoft Internet Explorer and Netscape Navigator. Use as many version releases of these browsers as possible. Also test the site on browsers on the PC, Macintosh and Sun platforms. Use both high and low resolutions and high and low color configurations to test the site. Perform extensive spell and link checking on the entire site. The developer should also find outside individuals to test the site. These individuals should be given specific tasks to perform in order to test the how efficient the design is. Once the testing phase is complete the site can be published and made available to the world.

Step 5. Promote

Now you have a web site, how will users find it? The most common way that users find sites on the Web is through the use of search engines. These search engines catalog sites and their content

through the use of META tags. These META tags are encoded into the web site pages but cannot be seen by the users. The developers must add these tags to the pages and use keywords and summaries that will make the site show up when the user searches for that content. For more information on META tags, visit: . The developer must submit their sites to search engines before the can be cataloged. This can be done manually or using tools such as Microsoft's SubmitIt. Currently the top search engines on the web are:

- Yahoo
- AltaVista
- MSN
- AOL
- Disney's GO Network
- Google
- GoTo
- Infoseek
- Dogpile

The site should be submitted to each of these as well as many other sites as possible. Then swap links with other sites and put your URL in as many places as possible. This includes business cards and all publications of the organization.

Step 6. Grow

Once your site is online and you begin getting visitors, it is time to grow. A web site is never complete it is always "under construction." The first step in growing the site is to read the log files. These files contain information about who your users are and how they are using your site. You can use this information to meet your needs better. This includes adding content that your users are looking for and to find out how well your navigation works. Another important step in growing your site is to bring your users back. Find creative ways to get users to come back on a weekly or monthly basis. This will make your site more poplar and more useful for your clientele.

Conclusion

Web development is by no means a perfect science. The web has only been in existence for six to seven years. Thus there are no real experts in the field. Developing a web site usually involves many revisions as the web changes and as developers find new and better ways to do things. Since the web is not yet a stable development process, this will probably continue until we have pushed the medium completely to its limits and it stables off. As illustrated through out this paper, anyone can build a web page, but a lot goes into a great web site. The Bugwood Work Group feels that they have effectively used the web to extend information to a larger audience and expand the traditional definition of Extension.

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Bugwood.org is using 29 web technologies in Analytics, Blog, Marketing Automation and Advertising categories. See full technology profiling of Bugwood.org. Â Website bugwood.org. bugwood center for invasive species and ecosystem health - university of georgia. 29. technologies. Recent Technology Changes in bugwood.org. 14 days ago. Added Google Analytics.