

# Usability Evaluation Report

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## *PSA Web Site Usability Evaluation Project*

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*Date: May 14, 2001*

## ***Executive Summary***

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This document reports the findings of the PSA Web Site Usability Evaluation Project. The evaluation sessions took place between February and April of 2001 and were conducted by the members of the Interactive Resources Team at the university facility at 82B Poole and in the subjects' homes. The evaluation observed seven subjects on various computers using the Public Service Activities Web Site.

The purpose of a usability evaluation is to observe the performance and satisfaction of users visiting the PSA Home Page in order to determine whether the site meets its usability goals and in order to detect any serious problems that the Interactive Resources Team will have to address. The Usability Evaluation also highlights some issues on other sites within the PSA web presentation.

### **The main findings can be summarized as follows:**

- The PSA Home Page accurately defines Clemson's Public Service Activities.
- The PSA Home Page accurately defines its function as a gate to the sites under PSA.
- The PSA Home Page supports users' free, exploratory browsing.
- The PSA Home Page needs improvement in the support of goal-oriented browsing.
- The PSA Home Page needs to improve the intuitiveness of its design elements.
- The PSA Home Page is aesthetically pleasing and well-designed for cross-platform and cross-browser applications, and for good usability on any computer type and internet connection.
- The PSA Home Page invites repeat visits.

Based on these findings we have developed recommendations that can further increase the usability of the site, thus widening the circle of its visitors, revealing more cross-linking between PSA's offerings, and attracting more publicity to Clemson's PSA. The finding also suggest that the PSA web site was successful in fulfilling the Interactive Resources Team's stated mission "To serve the people of South Carolina by providing interactive resources for Public Service Activities, establishing an online presence and a vital information portal to the more than 1,000 web sites under PSA".<sup>1</sup>

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<sup>1</sup> Statistical data also supports this finding. Based on WebTrends PSA Web Traffic Analysis generated for the first quarter of 2001, we can report that the PSA Home page is highly ranked on the Clemson domain (as the 20<sup>th</sup> most requested page from the entire clemson.edu domain). At the same time, the PSA Home Page consistently receives more hits than the Clemson Main Home Page (PSA Home Page averages 870 views per day, while the Clemson Home Page averages 608 views per day). See an illustrative chart created by Dr. Christine Boese in Appendix 1.

## ***Description of the Evaluation***

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This usability evaluation of the PSA Web Site took place between February and April of 2001. Within this timeframe the Interactive Resources Studio team members conducted seven usability evaluation sessions in compliance with the regulations of Clemson University's Institutional Review Board. Three tests took place in subjects' homes; four tests took place at the PSA Interactive Resources Studio (P&A Building, 82/B).

### **The Goals of the Evaluation**

The sessions intended to evaluate the real life usability of the site, identify problems and achievements in the current site design, and solicit recommendations that could further improve the site design. The project focused on testing the usability goals that the design team had identified based on a heuristic evaluation performed on PSA web site.

#### **The usability goals were as follows:**

- The PSA Home Page accurately defines Clemson's Public Service Activities.
- The PSA Home Page accurately defines its function as a gate to the sites under PSA.
- The PSA Home Page supports users' free, exploratory browsing.
- The PSA Home Page supports goal oriented browsing.
- The PSA Home Page offers intuitive design solutions.
- The PSA Home Page is aesthetically pleasing and well-designed for cross-platform and cross-browser applications, and for good usability on any computer type and internet connection.
- The PSA Home Page invites repeat visits.

To measure whether the site meets these usability goals, we directly observed seven participants as they used the site. We recruited volunteer participants through mailings and word of mouth based on specific subject selection criteria.

#### **Selection Criteria**

- have not seen the PSA Home Page before
- have no professional web design background
- have used the Internet before
- are familiar with some kind of browser application

## The Participants of the Evaluation

The participants each represented one of the audience groups we identified as the target audiences of the PSA Web Site. Since the site is designed for a wide range of audiences throughout South Carolina, we recruited participants from the entire state representing several age groups, educational backgrounds and computer experience levels. The Table 1 below summarizes the demographics of our study participants.

	Audience group	Gender	Age	Occupation	Browsing time/week	Favorites	Has heard of PSA before?
1	educator	female	48	elementary school teacher	less than 2 hours/week	about teaching	yes
2	gardener	male	41	research professor	more than 6 hours/week	usgs.gov clemson.edu	no
3	Clemson student	female	19	undergraduate student at Clemson	more than 6 hours/week	netscape.com napster.com New York times	no
4	teen	male	14	middle school student	less than 2 hours/week	nothing	no
5	community service professional	male	43	vocational rehabilitation counselor	more than 6 hours/week	ESPN, racing sites, air-life	no
6	farmer	male	45	part-time farmer	less than 2 hours/week	Clemson sites	yes
7	media professional	male	30	journalist	more than 6 hours/week	Clemson news E-trade	yes

**Table 1: Demographic Information on Study Participants**

We also made sure that participants used a variety of computers, browsers and Internet connections. Table 2 below shows the systems that the participants used.

	Platform	Processor	Resolution	Color	Connection	Browser
1	PC	48 MB Pentium	800x600	256	phone line	AOL
2	PC	256 MB Pentium II	1024x768	true color	T1	Internet Explorer
3	PC	256 MB Pentium II	1024x768	true color	T1	Netscape
4	PC	64 MB Pentium II	720x480	256	phone line	Internet Explorer
5	PC	450 MB Pentium II	1024x768	high color	phone line	Internet Explorer
6	PC	256 MB Pentium II	1024x768	true color	T1	Netscape
7	PC	256 MB Pentium II	1024x768	true color	T1	Internet Explorer

**Table 2: Computer Systems used by Study Participants**

## The Evaluation Protocol

In preparation for the testing, we set up the testing environment: the video camera, chairs for the participant, test administrator and her assistant. After greeting the participants, and introducing ourselves, we read out loud the Informed Consent Statement to the participants and asked for their signature as a sign of their approval. Then, we asked them a few questions about their demographic data and computer in the form of the pre-test questionnaire. When the questionnaire was complete we asked the participants to complete four different tasks. These tasks were formulated based on the usability goals the team has identified.

### The tasks were as follows:

1. Participants had to access the Public Service Activities web site from Clemson's Home Page and look at the PSA site for no more than three minutes.
2. Participants were given 10 minutes to freely browse in the PSA web presentation.
3. Participants had to find a program that Clemson's PSA offered in the coming two months and they wanted to attend.
4. Participants were asked to fill out the PSA Site Feedback Form.

Throughout the four tasks we asked subjects to say out loud everything that crossed their minds while working (This method of reporting thought is called a "think-aloud protocol"). Also, after each task we conducted a post-task interview. Finally, we thanked the participants and handed them a small gift, as a token of PSA's appreciation and opened up the field for free discussion. (Please see the test protocol in Appendix 2.)

## Data Collection and Analysis Methods

The evaluation sessions were video- and audio-taped. Only the computer screen was recorded. The test administrator and her assistant also took notes throughout the evaluation. These various methods of data collection ensured triangulation and that no data would be lost. It is also the standard in the field for minimizing bias. The video and audio data collected was transcribed and coded by the members of the Interactive Resources Team. (See transcripts and coding in Appendix 3.) To determine whether the site met the usability goals, we developed a specific measurement for each task. We defined what the criteria for successful completion of each task and these measurements served as units for data analysis. In the Table 3 we outline these indicators of the usability goals:

Usability Goal	Indicator (the task is completed successfully, if...)
The PSA Home Page accurately defines Clemson's Public Service Activities.	Participants verbalize that <ul style="list-style-type: none"> <li>• PSA is affiliated with Clemson</li> <li>• PSA serves the people of SC</li> <li>• PSA consists of a wide range of activities</li> </ul>
The PSA Home Page accurately defines its function as a gate to the sites under PSA.	Participants verbalize that <ul style="list-style-type: none"> <li>• the site is a gate, a portal</li> <li>• the site has a collection of links to other PSA pages</li> </ul>
The PSA Home Page supports users' free, exploratory browsing.	Participants are always oriented throughout the browsing, never get lost, find it easy to return to the PSA Home Page.
The PSA Home Page supports goal oriented browsing.	Participants find an program within 10 minutes.
The PSA Home Page offers intuitive design solutions.	All design elements are intuitive, they create accurate expectations, deliver on those expectations and are used appropriately.
The PSA Home Page is aesthetically pleasing and well-designed for cross-platform and cross-browser applications, and for good usability on any computer type and internet connection.	Participants give positive comments of the look or the page, no browser or platform incompatibilities are experienced, users don't complain about load time.
The PSA Home Page invites repeat visits.	Participants express their wish to bookmark the site.

Table 3: Usability Goal Indicators

## Results

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In this section we discuss the results of our measurements based on the data from the video and audio recordings, and the interviews in order of the usability goals.

### Usability Goal #1:

#### **The PSA Home Page accurately defines Clemson's Public Service Activities.**

We found that The PSA Home Page accurately defined Clemson's Public Service Activities. Tasks #1 and #2 were targeted at measuring this usability goal. In task#1 we asked subjects to look at the PSA Home Page (without clicking on anything in it), and gather general impressions about what Clemson's Public Service Activities can be about. In task#2 we allowed subjects to freely browse in the PSA web presentation. After both tasks, we asked subjects the following question:

*"If you had to explain to someone what this Home Page is all about, what would you say? If you gave someone this web address, saying: 'Check this out! At [www.clemson.edu/public](http://www.clemson.edu/public) you will find...' – how would you finish the sentence?"*

All subjects (7 of 7) gave answers that included the key elements: *PSA is affiliated with Clemson; PSA serves the people of SC; PSA consists of a wide range of activities.* Their answers were:

*"Go there, because there are lot of links there that are available through Clemson to the people." (Subject#1)*

*"Can learn about PSA and how its through Clemson. A lot of people already know about the extensions." (Subject#2)*

*"A lot of different links to a lot of different things that Clemson does on the side, not academic related, as it says more service oriented." (Subject#3)*

*"You'll find if you need like help with something, like this would be a place to go to get to web sites and things about Clemson and different things that they do for the people." (Subject#4)*

*"Information about activities and services here in this area, (...) It seemed to me in looking at this that its more a library of information." (Subject#5)*

*"I would describe it as a page that gives basic information on what PSA is about. It gives some links to other Public Service programs. It gives some information on some major programs that are involved with Public Service. It's just a general Public Service page and not a page that would describe Extension." (Subject#6)*

*"I would give them as a start to specific things that Clemson does for the public. It's a broad and easy way to access... a portal to more specific information." (Subject#7)*

**Since in all seven evaluations the PSA Home Page fulfilled the criteria of success in the tasks measuring this usability goal, we can conclude that the PSA Home Page has reached the usability goal of accurately defining Clemson's PSA.**

**Usability Goal #2:****The PSA Home Page accurately defines its function as a gate to the sites under PSA.**

We found that the PSA Home Page accurately defined its function as a gate to the sites under PSA. The measurement of this usability goal was tied to the measurement of the previous goal, thus the tasks #1 and #2, and answers to the post-task interview questions were relevant in our analysis. All subjects (seven of seven) gave answers to the post task-interview question that included the key element: *the PSA Home Page is a gate, a portal, has a collection of links to other pages.* (See quotes above!)

**Since in all seven evaluations the PSA Home Page fulfilled the criteria of success in measuring this usability goal, we can conclude that the PSA Home Page has reached the usability goal of accurately defining the function of the page.**

**Usability Goal #3:****The PSA Home Page supports users' free, exploratory browsing.**

We found that the PSA Home Page supported users' free, exploratory browsing. Task #2 was targeted at measuring this usability goal. In Task #2 we asked subjects freely browse for 10 minutes starting from the PSA Home Page in the PSA web presentation. We also asked them to say out loud everything that crossed their minds while browsing. We analyzed the video- and audio-recordings of their clicks and their verbal comments and found that from the total of 25 visited sites 23 times subjects stayed oriented, did not get confused or lost. We contribute this to the top banner of the PSA site that stays up as users click the links of the PSA Home page. We believe that it serves as a visual clue to where they are (within Clemson's PSA), offers an easy route back to the Home Page (home link), and at the same time allows them to access features that covers the entire PSA web presentation (such as search, mail, map). (See further discussion of the banner usability in the Goal # 5 section.)

There were 2 cases when users did get disoriented. Subject #1 stepped out of the PSA frame set, and from under the banner when she opened up an AOL search link, and she did not realize that she no longer was within the PSA web presentation. Subject #6, as he was trying to get back to the PSA Home Page from the Regulatory and Public Service site, opened up the Public Service Activities link within the regulatory frame set. The outcome was the PSA frame set loaded within the Regulatory frame set, as Figure 1 illustrates.



Figure 1. The PSA frame set loaded within the Regulatory frame set

In both cases subjects needed the test administrator's assistance to recover from the situation. We have to say, however that neither of these occurrences were the results of the PSA Home Page design. The first occurrence was due to features of the AOL browser, the second to the design of the Regulatory site. No corrections or improvements on the Home Page could prevent these situations from happening again. (For recommendations see the "Recommendations" chapter.)

After the browsing task we asked subject a few questions in the post task interview. To the question: "How did you like the browsing?" all seven participants gave positive answers.

*"I liked it, easier to come here than look at a book, good reminder!"* (Subject#1)

*"I guess it was nice, that you still have access to this page."* (Subject#2)

*"The pages were informational... you know where you are going!"* (Subject#3)

*"It was good, like a test drive."* (Subject#4)

*"It was easy, it wasn't difficult to do."* (Subject#5)

*"It was ok... I had a little trouble, but I usually do. Particularly Regulatory. That was one I'm*

*not familiar with. That was one of the reasons I went to that."* (Subject#6)

*"It was fast and fine and very representative of where the links are going to take you."* (Subject#7)

To the question: "How easy or difficult was it to navigate between the sites?" all seven participants answered "easy".

The positive comments received for these questions also support our results from the video and audio data.

**Since the majority of the browsing activities (23 out of 25) fulfilled the criteria of success in measuring this usability goal (participants are always oriented throughout the browsing, never get lost, find it easy to return to the PSA Home Page), we can**

conclude that the PSA Home Page has reached the usability goal of supporting free browsing.

#### Usability Goal #4:

**The PSA Home Page supports goal oriented browsing.**

We found that the PSA Home Page needs improvement in the support of goal oriented browsing. Tasks #3 was targeted at measuring this usability goal. In task#3 we asked subjects to find a program offered by Clemson's PSA that they or their family would like to attend in the coming two months. We also asked them to say out loud everything that crossed their minds while looking for the program. We analyzed the video and audio recordings of their clicks and their verbal comments to see how many subjects met the criteria for successfully completing this task, that is how many subjects found a program within 10 minutes. We found that from the 7 subjects only 3 found a program under 10 minutes. The following table displays the final success (if subject found a program or not), and the total time spent on this task for each subject; and the shaded fields indicate the occasions when the successful completion criteria is met:

	S/1	S/2	S/3	S/4	S/5	S/6	S/7
<b>Final success</b>	yes	no	yes	no	yes	no	yes
<b>Total time (minutes)</b>	28	6	7	17	3	12	5

While we believe that many personal considerations may have influenced these results, our analysis revealed two facts that suggest that we need to pay more attention to supporting information retrieval on PSA's Home Page. One of the facts is that from a total of 33 attempts only 9 led users to current calendars of events listing (in some cases they did reach events, but those were out of date). The other is that it took 4 clicks on the average to get to an event.

After the tasks we asked users the following question:

*"How easy or difficult was it to find a program? What made it easy? What made it difficult? How could the difficulties be corrected?"*

The subjects' answers varied from difficult to easy:

*"I'm not used to finding programs on the Internet. It took me longer than I expected. Maybe if the search had a different wording..."* (Subject#1)

*"It did not feel intuitive... It felt like: we'll make you jump through some hoops to find it. If you found it, congratulations! Your netskills are worthy of our site. (...) I'm really surprised there is not something on the botanical garden right here (above scroll on Home Page) It seems there are lot of links tucked away."* (Subject#2)

*"It was not difficult to find the programs, but they were all out of date. It was easy to link from the home page to conferences and seminars, but they were all out of date. Either update them or remove them."* (Subject#3)

*"They did not have a calendar on this page to go to and find a program. If you had a calendar on top you could just go there and find out what's going on."* (Subject#4)

*"It was really easy. Because all I had to do was go to the uh, well what did I click on? Seems like I clicked on, I don't remember what I clicked on, was it Farmers? No. I just saw T. Ed Garrison on one of the (audience path) links and just clicked on that, the calendar, and if I remember right, it just pulled the calendar right up. And it was really pretty easy to determine because it gave me a choice for every month. And then to scan down that list of activities it was pretty easy to see if there was anything there I wanted to go to." (Subject#5)*

*"If I were looking for one at the university, I struck out. But if I went to an extension office, they did have a calendar of events. How up-to-date it was, I don't know. They may be getting ready to update it for the next three months. I thought it was pretty easy once there was a calendar of events." (Subject#6)*

*"It was easy given the fact that I already knew what I was interested in. The connections was quick... besides the fact that the one button had a misleading heading it was easy." (Subject#7)*

The variety of reactions received from the participants show that not all users found the site supportive of their search for a program.

**Since only 3 out of the 7 subjects found a program of their liking within 10 minutes, and fulfilled the criteria of success in measuring this usability goal, we can conclude that the PSA Home Page needs improvement in the support of goal-oriented browsing.**

**Usability Goal #5:****The PSA Home Page offers intuitive design solutions.**

We found that The PSA Home Page needs to improve the intuitiveness of its design elements. Tasks #2 and #3 both provided insights into how design elements operate on the Home Page. The data on users' clicks (collected by video recording) and data on users' observations and opinions (collected by audio recording their think-aloud protocols) were analyzed in reference to the design elements. Figure 2 illustrates the design elements on the Home Page.

- A) Splash page
- B) Flash help
- C) Top bar home link
- D) Top bar help link
- E) Top bar map link
- F) Top bar search
- G) Top bar mail link
- H) Rotating banner link
- I) Audience paths
- J) Green bar links
- K) Institution links
- L) CW articles
- M) Sandhill link
- N) Goal picture link



**Figure 2. Multiple Access Site Structuring (M.A.S.S.) design elements on the PSA Home Page**

We counted the number of clicks falling on these design elements to see if they are used, and then analyzed users' comments to see if these elements were intuitive, that is, if users could form accurate expectations, and whether or not those expectations were met. In the following sections we report on each design element individually.

**A) Splash page**

Three out of 7 subjects (#2, #3, and #7) understood the concept of the Flash page and clicked "Flash-enabled" or "non-Flash-enabled" links appropriately. Four subjects formed misconceptions about the Splash page. Subject #1 observed the page and read out loud the Macromedia download instructions, then said: "I'm not sure what I'm supposed to do". Eventually, she clicked the "Flash-enabled" link at random.

Subject #4 was also puzzled and commented on the page with the following words: *“Does it matter what I choose? I don’t know what it means, but I think I don’t have things on this computer, so I choose this one”*, and clicked on the “non-Flash-enabled” link.

Subject#5 thought that the “Research, Regulatory, Extension” words were hot spots, and clicked on the word “research”.

Subject #6 had similar impressions when he said: *“I’m at the right place? It shows that Public Service Activities are basically three departments, or three major sections: Extension, Research, and Regulatory. Can I go beyond this? One step beyond. Let’s go here”* and clicks on the word “Research” and gets PSA home. But he remembers seeing extension, so immediately backs out, and clicks on the word “Extension”. He is surprised that he got to the same page again.

Since the majority of users formed misconceptions about the splash page we conclude that this design element should become more intuitive.

## **B) Flash help**

Four subjects way the Flash animated help launching from the splash page. Only two of them opened the “Flash-enabled” link on the splash page intentionally, one subject clicked on it at random, another one intended to click on the word “extension”, but the hot spot was actually the hit area of the “Flash-enabled” link. None of the subjects played it in full length. Three of the 4 subjects who launched it thought it was an intro, and wanted to get out of it as soon as possible. Only one, Subject #6 got close to recognizing the function of the Flash piece as “instructions”, but he, too, wanted to close before it was over.

Since none of the subjects recognized the use of the Flash piece, we conclude that the intuitiveness of this design element can be improved as well.<sup>2</sup>

## **C) Top bar home link**

The analysis of the video recordings showed that from the all backward movements only 2 utilized the top bar home link, and more than 50 clicks fell on the browser back button. While the dominance of browser tools, especially the browser back button is an accepted usability fact by now, we still hope for a better utilization of the top bar’s home link.

Since users clicked on the banner help link only with negligible frequency, we conclude that this design element should become more intuitive.

## **D) Banner help link**

None of the subjects clicked on the banner help link. This could indicate that they did not need help (although they did ask the test administrator for helpful hints) or they personal preference not to use the site’s help, but can also point to the need to improve the intuitiveness of the banner help link.

## **E) Top bar map link**

None of the subjects clicked on the top bar map link. Subject#1 did see the map link in the footer (but never clicked on it), and she thought it is a geographical map. The lack of hits on the top bar’s map link indicates that this design element needs to be more intuitive.

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<sup>2</sup> The statistical results of WebTrends (see Footnote1), which shows that the Flash-enabled side is very popular (the 8<sup>th</sup> most popular page from all pages of PSA’s pages), augment this finding.

## F) Top bar search link

In Task #3, which was directed at information retrieval, subjects could have benefited from the search option. But from the total of 33 attempts only 2 used the site's search.<sup>3</sup> Only two subjects used the top bar search functionality for the total number of two searches. Neither of the searched yielded the expected results. While it's beyond the scope of this study to improve the search engine, and the indexing of other sites, we still contend that search has not been utilized to its potential by our subjects, and we suggest that its usability should be improved.

## G) Top bar mail

None of the subjects clicked on the top bar mail link. This can be explained simply by the fact that they did not have the specific task to contact anyone during their tasks, but also raises the question whether the design element is intuitive enough to invite clicks.

## H) Rotating banner links

While rotating banners appear at three different locations of the PSA Home Page (top bar, green bar, footer), only one subject clicked on a rotating logo, and another subject commented on it. Subject#1 clicked on a Botanical Garden banner is the green field in Task#3, and found what she expected with the link. Subject#2 commented on the blinking Cruisers banner several times during his think-aloud protocol:

*"...that light is slowly getting to me...That's bothersome, it has entered the realm of irritating. I was hoping it would go away."* (Subject#2)

The rare use of the rotating banners, and the clearly expressed dislike of the distraction that the animation posed suggest that the usability value of this design element needs further consideration.

## I) Audience Path links

Four out of the 7 subjects used the audience paths a total of 19 times to navigate during tasks #2 and #3.<sup>4</sup> The audience paths opened up in a new, mobile window, and were active till the cursor was within the path window. As soon as subjects rolled out of the path window, it disappeared (while it was still showing in the lower toolbar). Subject could reactivate the window by clicking on its name in the lower toolbar. This feature of the audience path window required subjects to manage multiple windows. All 4 subjects, who used the audience paths, had some learning curve figuring out this system (one of them remained completely unaware of it), but once they did, they commented positively on its value:

*"There were some new things here, these little side bars kick up... I guess they are nice, you still have access to this page. I begin to see the value to those."* (Subject #2)

*It was a little bit different in that this pop up screen with the menu came up instead of the frames kind of thing where you have the choices over here (motions left side) and everything shows up in a frame. I don't particularly like that style anyway. This once I realized what it was going to be it was fine. But it took me a minute to recognize that that y'all had that (audience path window). "* (Subject#5)

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<sup>3</sup> Users' behavior seems to differ in the case of our usability study from the behavior that WebTrends' statistics (See Footnote1) suggest. Statistically the "search" page is the 9<sup>th</sup> most often visited page in the entire PSA site.

<sup>4</sup> WebTrends' statistics also show the Gardener and the Farmer audience paths to be very often requested pages (11<sup>th</sup> and 15<sup>th</sup>, respectively).

But we still believe that this design element would meet its usability goal of initiatives if all visitors of the site could figure out their use, and could use it with easy. Subject#2 pointed out just the problem with the audience path design element when he said:

*"I can see people who don't often go to pages, they come here, and don't even know these are links, until you roll over... I'm surprised that farmer is that flower. These icons, because they are unlabelled, they could just be considered graphics, nothing more  
(...) These still are not... When I come back, I still have to go and sit on them, I can't just scan them...What is this? Wheel? For teenagers? It's not pulling me in..."*  
(Subject#2)

Since some subjects did not use the audience path feature, and others had to "learn" to use them, we conclude that the intuitiveness of this design element needs improvement.

## **J) Green bar links**

Five out of the 7 subjects clicked on links in the green bar a total of 12 times. The green bar is along the left side of the page, which is the traditional place of site navigation. Also, the dark background calls attention to it, therefore subject#2 spoke for many other web users when he said:

*"If you want to find something, this is where you go (green bar) Here is what you want to look at (green bar) and it just keeps dragging on..."* (Subject#2)

This is why we attribute high importance to the link structures and placements on this green bar. Since the majority of subjects did use the green bar, and the simple text links did prove to be intuitive, we conclude that this design element met its usability goal.

## **K) Institution links**

Five out of 7 subjects used the institution links, and the simple text links proved to be intuitive. We conclude that this design element met its usability goal.

## **L) Sandhill link**

Three out of 7 subjects noticed the Sandhill link. One of them only commented on it, who of them actually clicked on, and found it disappointing, commenting the following way:

*"I'm not sure what this is right here - Sandhill?"* (Subject #2)

*"I'll go to Sandhill Research because it sounds different, interesting. Oh come on (switches windows). Where'd that go? There it is. All right, This is really NOT what I was I was hoping more for just a page to look at."* (Subject #5)

Since in both cases the link did not meet the subjects' expectation, we conclude that the Sandhill link does not meet its usability goal successfully.

## **M) Clemson World links**

Two out of 7 subjects clicked on links under the Clemson World Magazine header. None of the subjects expected to find Magazine Articles, what they were hoping for were links to

programs and institutions of PSA. One of the subjects did realize that the links lead to articles, but he clearly expresses his dissatisfaction:

*"Now I expected to go straight to the Geology Museum web page Instead we get an article from Debby Dallhouse"*

Then he goes on critiquing the outdated list of articles:

*"I'm not even sure what these dates of for? When things happened? Is this article 3 years old? I don't understand it? I think web pages are current things, why do you have articles that are 3 years old?"* (Subject #2)

Another subject also commented on the old articles:

*"These here are out of date Clemson World articles, you should just ditch the ones that weren't getting any hits after a few months."* (Subject #7)

Since subject who used the Clemson World Article links did not find their expectations met, we conclude that this design element did not meet its usability goals.

## **N) Goal picture link**

None of the subjects clicked on the goal picture. Subject#2 made comments on it, saying:

*"This is weird to me (the picture of a set table...) It doesn't do much for food safety and nutrition."* (Subject #2)

The rotation of goal pictures contributed to the confusion of subject#6 when entering the site from the splash page. He thought that the different pictures distinguish the extension vs. research vs. regulatory pages:

*"Now when I go to Extension, it looks like it gives me almost the same web page. Not what I was expecting. I thought Sandhill was also on the Research. I thought it would have more, if I click on Extension, I would think it would have more about Extension Services. [clicks Back button to Splash page] And on the Research side it had about Sandhill Rec, which is to me a research station, so Extension Services ought to give us something about Extension services. (...) And see you've got...you've got a different picture, but it doesn't tell us what Regulatory is."* (Subject #6)

Since no one noticed that the goal picture is a hot spot, we conclude that the goal picture link did not serve its usability goal (although we feel that it did contribute to the success of usability goal number 6 with its aesthetic value).

**To summarize usability goal of intuitive design elements (Goal #5), we can conclude based on our analysis that several design elements of PSA Home Page need improvements.<sup>5</sup> In the recommendations section we will outline some ways in the direction of enhanced intuitiveness.**

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<sup>5</sup> The wide variety of navigational elements the PSA Home Page had to offer were designed based on the M.A.S.S. (Multiple Access Site Structure) theory. M.A.S.S. is a site infrastructure theory being tested by Dr. Christine Boese as a method of allowing a single site to serve a wide variety of audiences and needs. This interface design theory builds multiple paths into the deep structure of the interface, thus taking the pressure off any given navigational feature to be absolutely usable by every user. With M.A.S.S. multiple users, multiple paths, a variety of experience levels, and inconsistent load times, every feature may not work for every user. But, if the theory is correct, each diverse user will find several navigational features she understands which will allow her to meet her needs from the site.

**Usability Goal #6:**

**The PSA Home Page is aesthetically pleasing and well-designed for cross-platform and cross-browser applications, and for good usability on any computer type and internet connection.**

We found that The PSA Home Page fulfilled the usability goal of being aesthetically pleasing and well-designed for cross-platform and cross-browser applications, and for good usability on any computer type and internet connection. While no particular tasks were targeted at soliciting users' comments about the "look and feel and speed" of the site design, they all touched on it in their think-aloud protocols of interviews. All the subjects (7 of 7) made positive remarks about the aesthetics of the site:

*"this really looks nice"* (Subject #1)

*"Looks well laid out, almost overwhelming, but you are used to that. If you want information it's all there."* (Subject #2)

*"It's nice. It has a lot of white space."* (Subject #3)

*"It's clean."* (Subject #4)

*"It's clear and easy to understand."* (Subject #5)

*"It's a nice page."* (Subject #6)

*"It was a clean-cut page, similar to Clemson's Home Page."* (Subject #7)

The only critique that related to the aesthetics of the page concerned the color difference between the unvisited and visited links of the Clemson World articles. Subject #2 said:

*"I'd like to see more difference between the colors of the visited and non-visited link . It even got lighter, not much contrast."* (Subject #2)

Looking at the PSA Home Page in the course of the 7 tests (3 of them on phone lines) we observed that load times were good, except in one test (Subject #4), but in this case the computer caused the problem. We also saw that no browser incompatibilities occurred on the three different browsers that subjects used in the tests (AOL, Netscape and Internet Explorer). We have also noticed while looking at the page on a total of 4 different computers, with different color settings (256, high color, true color) that some of the colors used in the design are not web safe, therefore in the recommendations section we will include this issue.

**Since all subject made positive comments on the look of the page, and none of them complained about browser or platform incompatibilities or load time (neither did any of the test administrators experienced such) we conclude that the PSA Home Page fulfilled the criteria of success in this usability goal.**

**Usability Goal #7:****The PSA Home Page invites repeat visits.**

We found that the PSA Home Page invites repeat visits. In the Feedback Form subjects had to answer the question: "Would you add this page to your bookmarks?", and 6 out of 7 said that they would. The one subject, who did not give a positive answer said:

*"And would I add it to my bookmarks. Probably not. Um. The reason I wouldn't add it to my bookmarks is because I live in this area and I know that this is not the only source of schedule of activities around here. There's a monthly publication that you can just pick up walking down the street about activities at Clemson and most of these activities also get some publicity in the local papers and stuff. But if I was a frequent or even a if this was a place I would come to 3 or 4 times a year and I lived somewhere else and the "Clemson Experience" was important to me, I probably would. Well I don't know if I would or not because I probably would have clemson.edu already bookmarked, and it is so easy to type in I wouldn't even do that. But this is on Clemson's home page, so I don't know that I would bookmark it." (Subject#5)*

**Since the majority of the subjects would add the PSA Home Page to their bookmarks we conclude that it has fulfilled the usability goal of inviting repeat visits.**

The areas where the PSA Home Page did not fulfill the usability goals are identified as problem areas. In the following "Recommendations" section we list all of these problem areas in the order of importance, and suggest ways of improvement.

## Recommendations

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In this section we list the usability problems ranked by their severity. We identified 4 levels of severity within usability problems (based on Dumas and Redish's Practical Guide to Usability Testing). The levels in the severity ranking are the following:

- Level 1 problem: prevent completion of task
- Level 2 problem: create significant delay and frustration
- Level 3 problem: have a minor effect on usability
- Level 4 problem: more subtle, point to an enhancement

The following table shows the usability problems we have detected on the PSA home page in the severity ranking, and also recommendations for improvement:

Usability problem	Severity ranking	Recommendations
Splash Page	level 2	delete it
Top Bar Search	level 2	make it more available and visible (e.g.: display a search field in banner bar)
Audience Paths	level 2	make it more intuitive to lower-end users (e.g.: label it) simplify the window management requirements (e.g.: load into the frame set)
Clemson World Articles	level 2	make the links more intuitive, make it clear that it's the magazine's articles that they'll see, not another home page (e.g.: by visual clues) Shorten list (e.g.: delete previous years)
Green Bar	level 2	clarify the link structure
Top Bar Help	level 3	do not ever load it automatically; rename it (e.g.: "guide") make the link more "menu"-like
Top Bar Home	level 3	make the link more "menu"-like
Top Bar Map	level 3	rename (e.g.: "topics", "areas", "overview") make the link more "menu"-like
Top Bar Mail	level 3	rename (e.g.: "contact") make the link more "menu"-like
Sandhill	level 3	make link more intuitive (e.g.: hint on that the link takes them to a document)
Goal picture	level 3	clarify its function (e.g.: indicate that it's clickable)
Web safe colors	level 4	make sure that all colors are web safe