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Yellow Sticky, PHP Software for an Electronic Brainstorming Experiment

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Abstract

A web-based brainstorm was conducted in the summer of 2007 within the Sandia Restricted Network. This brainstorming experiment was modeled around the 'yellow sticky' brainstorms that are used in many face-to-face meetings at Sandia National Laboratories. This document discusses the implementation and makes suggestions for future implementations.

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Introduction

The LDRD project "Improving Human Effectiveness for Extreme-Scale Problem Solving" was an investigation into how Sandia National Laboratories might make use new web-based capabilities to address wickedly difficult problems[1, 2]. Such problems are characterized by disagreement about even the nature of the problem and are so multi-dimensional that it is difficult to make judgments about progress toward any solution. It was hypothesized that extremely large teams working in electronically mediated environments might sample a larger collection of ideas and hence lead to better ways to attack these wickedly difficult problems.

While, the proposed technologies are recently new, there is evidence that large communities, working together on the web, can solve problems much faster than small teams [3, 4], see also http://cloudmakers.org. These problem solving communities often make use of collaboration systems, which are widely available and which have been previously used for knowledge dissemination (for example, Wikipedia), and electronic exchange of ideas (for example email, and threaded forums). Here, however, we focus on software for an experiment comparing two modes of electronic brainstorming centered around a wickedly hard problem. We tested a nominal mode, where the participants submit their own ideas without seeing anyone else's ideas, and an alternate mode, where every member of the group can see all of the ideas submitted by the group members.

The small experiment, designed and conducted as part of our research, specifically narrowed the scope to address two questions: one proposed by Tom Hunter, the President of Sandia National Laboratories, and a second question that has been used in previous, academic research on brainstorming[5, 6]. Student interns were randomly assigned one of these questions, while regular employees were only asked to consider Tom Hunter's question.

Each group was further divided in half to form the two experimental treatments (brainstorming alone, or working collaboratively in a group), as described above. The groups and the group names are shown in Figure 1.

The Sandia National Laboratories Human Studies Board approved the experiment, all materials presented and the data collection strategies[7]. In particular, registration to participate in the online experiment required the protection of the participants' anonymity, and their informed consent about the nature of the experiment and their rights with respect to the protection of human subjects[8]. Informed consent was deemed to be met by a participant's registration after the presentation of a web page explaining participant rights and the conditions of the experiment.

The system maintained a database indexed by the usernames selected by the participants after being warned to choose identifiers that would protect their true identities. The system collected the following data 1) the group to which each participant was assigned, 2) the ideas they generated, 3) a time log showing when participants interacted with the various elements of the system, and 4) a satisfaction questionnaire, which was modeled after the questionnaire used in previous academic brainstorming studies[9].

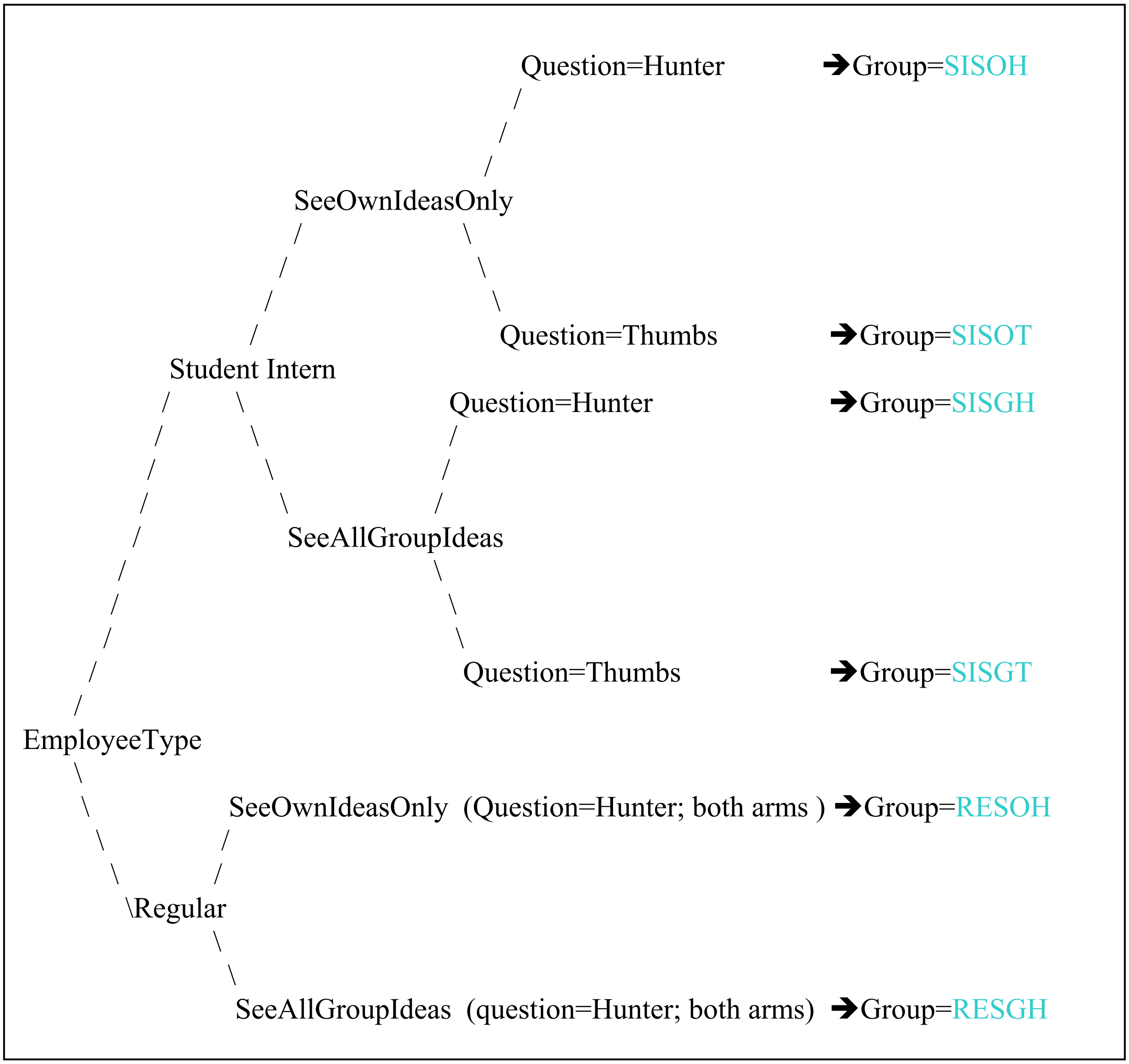


Figure 1 Group assignments were made randomly based on the order of registration. Individuals were assigned one of two questions, and one of two modes of interactions with other members of the group. Student interns were randomly assigned one of two possible questions, while regular employees were all given the same brainstorming question.

The following sections will briefly describe the pages presented to the users, and the pathways through the system by means of menu items at the bottom of most pages. A short discussion of the shortcomings of this system will be given, together with suggestions for future work. The appendices contain the mySQL database descriptions for the system, images of the web pages, and the PHP code.

System Modules and web pages

Figure 2 shows that one enters the system from Begin.php, and exits with logout.php. The core capability is a set of mutually accessible pages that add and review ideas, change the password, allow one to review the brainstorming instructions and take (or retake) the satisfaction questionnaire. Access to all of these capabilities is restricted to individuals who have first passed through the initial registration process, which consists of the three pages shown at the upper left of the figure. These pages ensure that an account is only opened for the participant after they have been given the informed consent information, and after they have supplied information relevant to the analysis of the experiment with respect to age, sex, and job category. Screen images of the pages are available in Appendix I.

Table 1 shows the database and tables required to implement the system. Because participants must be assigned at random to one of two groups with different experimental treatments (can they only see their own ideas, or all of the ideas generated by other members of their group), and because the students are asked one of two questions at random (regular employees all see the same question), a method was required to make these assignments.

This division is implemented by using separate tables for student interns and for regular employees, where an auto_increment key is used. Individuals with even keys are assigned to the group able to see all of their group's ideas, while those with odd keys are able to see only their own postings. For the students, if after dividing the key by 2 and the result is odd, then they are asked to brainstorm about a question used in prior research[5, 6], otherwise they are asked the question posed by Tom Hunter.

After assignment to groups is complete, the user table can be updated to record the username, and encoded password selected by the participant. For convenience, the employee type and group assignment are also recorded in this table. Email addresses are often used so that users can be emailed new passwords if they forget their original one; however, HSB concerns led to the elimination of that capability, though the database field remains in the table.

The yellow_sticky table records the ideas, after stripping and escaping sequences that could be used to attack the system (this precaution is recommended in[10]). However, given the participant complaints, and minimal threat of insider attacks, it might have been better to have allowed html formatting codes. The time of the submission and owner of the idea are recorded to enable proper attribution and temporal analysis.

The questions asked of the participants are encoded in the table describe_question, where the identifier specifies either 'HUNTER' or 'THUMBS' for the two questions. Finally, the responses to the online questionnaire are recorded for each of nine questions. The questionnaire can be resubmitted as many times as desired, but only the final values are used for analysis in the experiment.

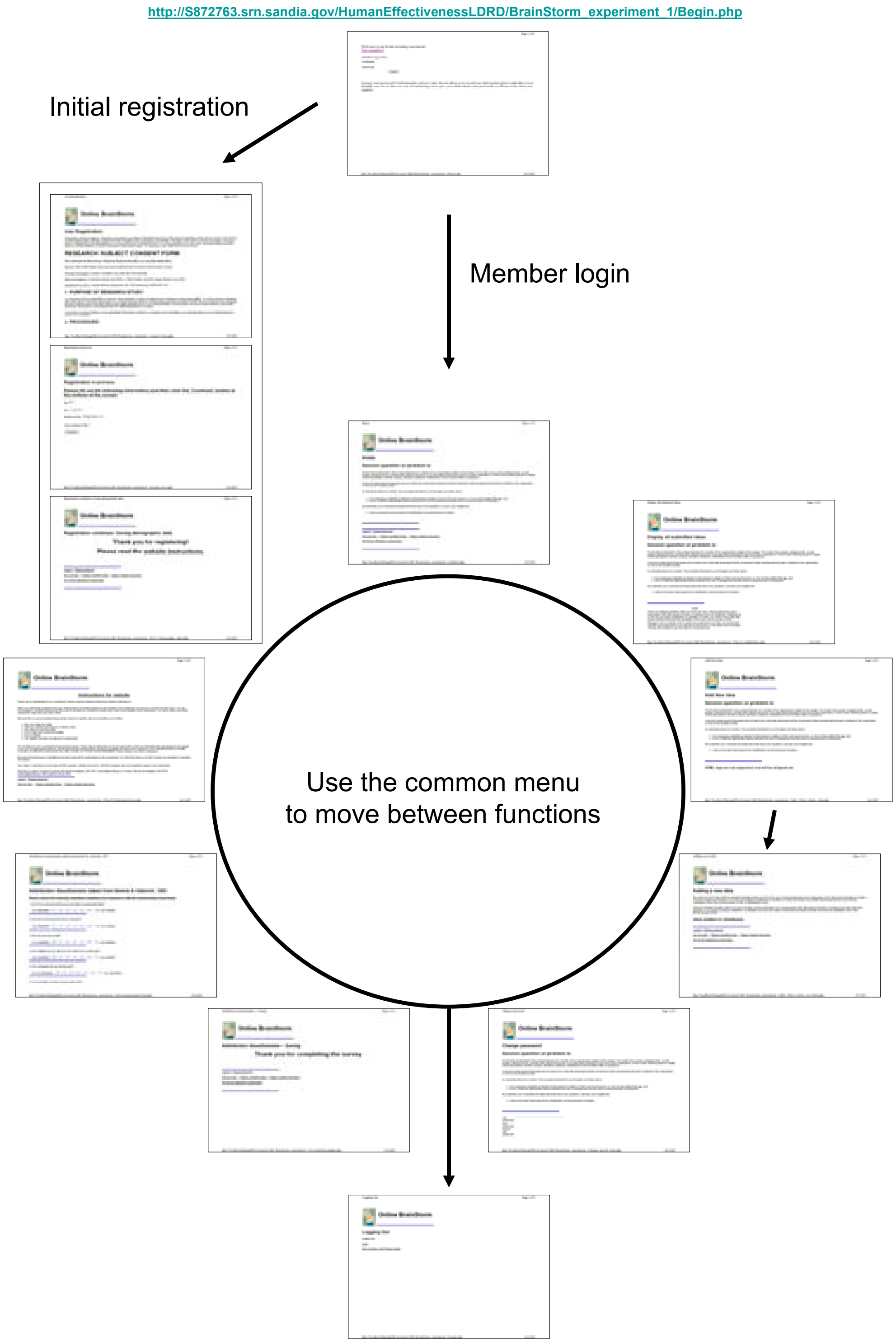
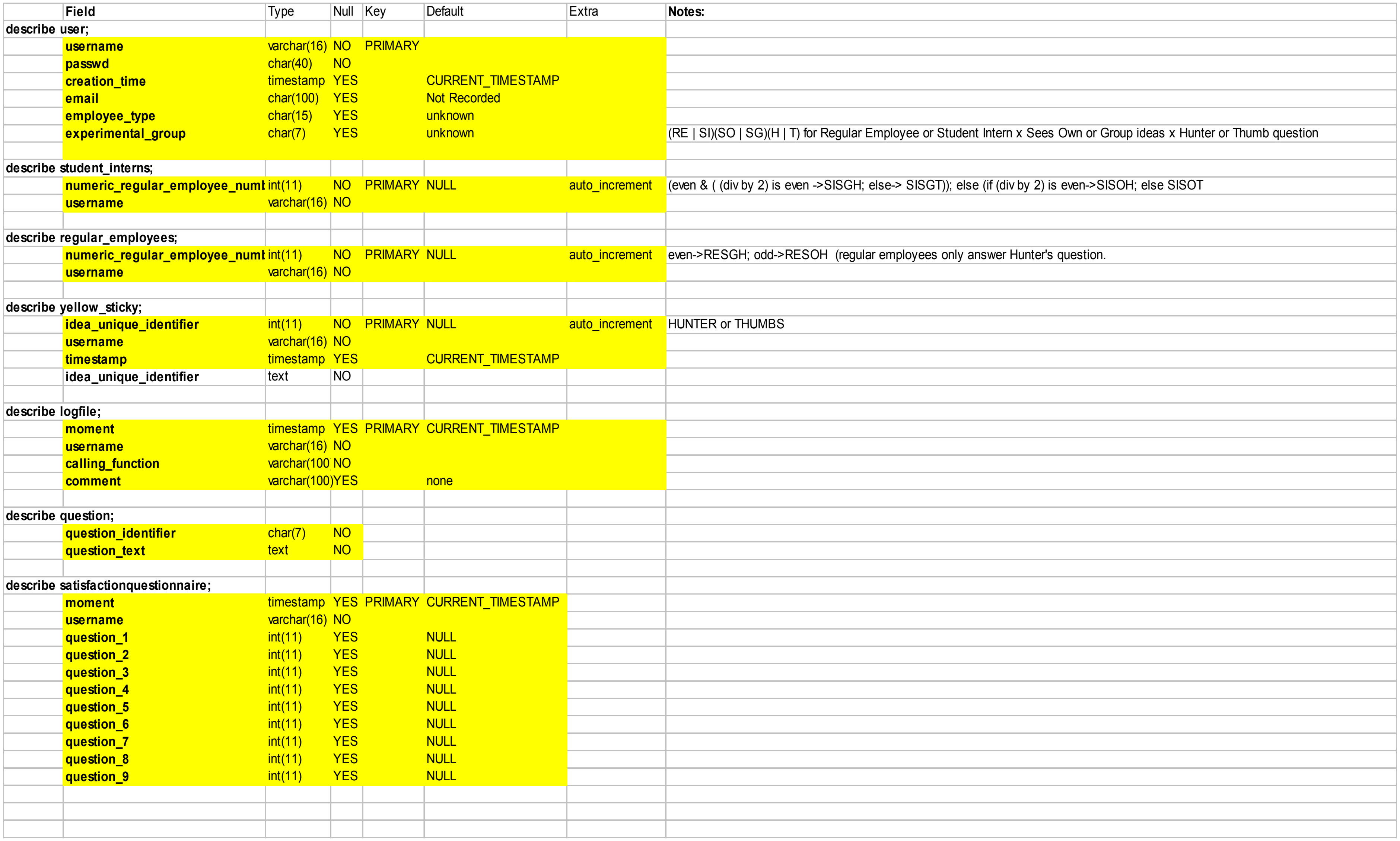

http://S872763.srn.sandia.gov/HumanEffectivenessLDRD/BrainStorm_experiment_1/Begin.php
Initial registration
Member login
Use the common menu
to move between functions

Figure 2 The web pages and the flow of access between them. Note that participants must initially register, but thereafter can enter as members.



	Field	Type	Null	Key	Default	Extra	Notes:
describe user;							
	username	varchar(16)	NO	PRIMARY			
	passwd	char(40)	NO				
	creation_time	timestamp	YES		CURRENT_TIMESTAMP		
	email	char(100)	YES		Not Recorded		
	employee_type	char(15)	YES		unknown		
	experimental_group	char(7)	YES		unknown		(RE | SI)(SO | SG)(H | T) for Regular Employee or Student Intern x Sees Own or Group ideas x Hunter or Thumb question
describe student_interns;							
	numeric_regular_employee_numt	int(11)	NO	PRIMARY	NULL	auto_increment	(even & ((div by 2) is even ->SISGH; else-> SISGT)); else (if (div by 2) is even->SISOH; else SISOT
	username	varchar(16)	NO				
describe regular_employees;							
	numeric_regular_employee_numt	int(11)	NO	PRIMARY	NULL	auto_increment	even->RESGH; odd->RESOH (regular employees only answer Hunter's question.
	username	varchar(16)	NO				
describe yellow_sticky;							
	idea_unique_identifier	int(11)	NO	PRIMARY	NULL	auto_increment	HUNTER or THUMBS
	username	varchar(16)	NO				
	timestamp	timestamp	YES		CURRENT_TIMESTAMP		
	idea_unique_identifier	text	NO				
describe logfile;							
	moment	timestamp	YES	PRIMARY	CURRENT_TIMESTAMP		
	username	varchar(16)	NO				
	calling_function	varchar(100	NO				
	comment	varchar(100)	YES		none		
describe question;							
	question_identifier	char(7)	NO				
	question_text	text	NO				
describe satisfactionquestionnaire;							
	moment	timestamp	YES	PRIMARY	CURRENT_TIMESTAMP		
	username	varchar(16)	NO				
	question_1	int(11)	YES		NULL		
	question_2	int(11)	YES		NULL		
	question_3	int(11)	YES		NULL		
	question_4	int(11)	YES		NULL		
	question_5	int(11)	YES		NULL		
	question_6	int(11)	YES		NULL		
	question_7	int(11)	YES		NULL		
	question_8	int(11)	YES		NULL		
	question_9	int(11)	YES		NULL		

Table 1, SQL table definitions. Note that participants' email addresses were not requested, nor was the field used in this study.

Discussion

The software successfully implemented the designed experiment, even running on a laptop as the server. However, many participants were critical of the user interface, did not recognize, or were nonplussed by the yellow-sticky metaphor, and complained about the lack of formatting capability for their ideas.

In retrospect, the yellow-sticky metaphor does not seem to be useful, and the rate at which idea generation fell off after the first day suggests that deep investigation of difficult problems will require that the participants be able to engage each other in discourse, rather than just submit ideas one by one. As a result, it might be better to base future work around discussion forum software. It might also be helpful to relax some of the anonymity restrictions, or to fix the system to be able to push notifications out to the windows of logged-in participants. That way, participants could be notified when someone has presented an idea similar to one of their own, or if they have marked key ideas as being particularly interesting to them.

The short comings of the present system should be addressed for future web-based interactions. However, even with an imperfect tool, we observed the Sandia community coming together around an interesting question, and we found that Sandia employees are willing to contribute their thoughts and ideas via an electronic media. Further, their contributions were often lengthy, and well reasoned, and constitute a resources, which we intend to deeply analyze and make available to the company.

Finally, we had hoped to have hundreds of users, and see a way to scale to thousands. However, that did not materialize (though we did have about 150 participants). Had a very large number of employees participated, it is likely that many submissions would have been relatively redundant, and reading through them would have grown tiresome to participants. This is a problem that deserves further attention.

Perhaps, large scale, online sessions need moderators or even hierarchies of moderators to bring some order to the chaos. Absent official moderators, it would be interesting to test whether participants would self organize into groups following the lead of individuals voluntarily taking up the mantle of informal moderators.

It is interesting to note that social networks within companies often self organize independently of the official hierarchy, and have highly connected people who function informally to connect widely separated elements of the bureaucracy. Others quickly become recognized as experts whose opinions are respected (these people may be serving a role similar to moderators). Perhaps these roles (people whose point of view is broadly valued, and others who keep the corporate discourse (rumor mill) buzzing are not incidental, but are essential for effective human interactions, both in real life and within computer mediated problem solving environments.

References

[1] N. Roberts, "Coping with wicked problems: the case of Afghanistan,," in *Learning from the international public reform*. London: Elsevier Scientific Publishing Company, Inc., 2001.

[2] H. Rittel and M. Webber, "Dilemmas in a general theory of planning," in *Policy Sciences*, vol. 4. London: Elsevier Scientific Publishing Company, Inc., 1973, pp. 155-169.

[3] J. McGonigal, "A Real Little Game: The performance of belief in pervasive play," presented at Proceedings of the DiGRA conference, Utecht, Netherlands, 2003.

[4] J. McGonigal, "This is not a game: Immersive Aesthetics & Collective Play," presented at DAC 2003, Melbourne, Australia, 2003.

[5] T. J. Bouchard and M. Hare, "Size, performance, and potential in brainstorming groups," *Journal of Applied Psychology*, vol. 54, pp. 51-55, 1970.

[6] R. B. Gallupe, W. H. Cooper, M.-L. Grise, and L. M. Bastianutti, "Blocking electronic brainstorms," *Journal of Applied Psychology*, vol. 79, pp. 77-86, 1994.

[7] T. Reser, "Expedited Review of SNL0727." Albuquerque, New Mexico: Sandia National Laboratories, Human Studies Review Board, 2007.

[8] http://www.hhs.gov/ohrp/documents/OHRPRegulations.pdf, "Code of Federal Regulations. Title 45 -- Public Welfare, Department of Health and Human Services Part 46, Protection of Human Subjects," 2005.

[9] A. R. Dennis and J. S. Valacich, "Computer brainstorms: More heads are better than one," *Journal of Applied Psychology*, vol. 78, pp. 531-537, 1993.

[10] L. Welling and L. Thomson, *PHP and MySQL Web Development*, Third ed. Indianapolis, Indiana: Sams Publishing, 2005.

Appendix I

MySQL table definitions and initial data

This appendix contains notes about how the database for the experiment was created, and how the tables were defined. It is included as a reference.

Making the database:

Log in as root and create our new database: LDRD105937:

```
mysql> create database LDRD105937;
```

Defining and creating the tables and columns:

To reate the various tables within LDRD105937, use the following SQL (note: to reset everything, including the autoincrement back to 0, use TRUNCATE TABLE tablename;).

```
CREATE TABLE user
   (username              VARCHAR( 16) NOT NULL PRIMARY KEY,
    passwd                CHAR( 40) NOT NULL,
    creation_time         TIMESTAMP,
    email                 CHAR(100) DEFAULT  'Not Recorded'
    employee_type         CHAR(  15) DEFAULT  'unknown',
    experimental_group    CHAR(    7) DEFAULT  'unknown'
   );


CREATE TABLE yellow_sticky
   (idea_unique_identifier   INTEGER AUTO_INCREMENT PRIMARY KEY,
    username                 VARCHAR( 16) NOT NULL,
    timestamp                TIMESTAMP,
    idea                     TEXT NOT NULL
   );

CREATE TABLE question
  (question_identifier CHAR(7) not null,
    question_text         TEXT not null
  );
```

```
CREATE TABLE regular_employees
  (numeric_regular_employee_number   INTEGER AUTO_INCREMENT PRIMARY KEY,
   username                          VARCHAR( 16) NOT NULL
  );
CREATE TABLE student_interns
  (numeric_student_intern_number  INTEGER AUTO_INCREMENT PRIMARY KEY,
   username                       VARCHAR( 16) NOT NULL
  );

CREATE TABLE logfile
   (moment                        TIMESTAMP PRIMARY KEY,
    username                      VARCHAR( 16) NOT NULL,
   calling_function               VARCHAR(100) NOT NULL,
   function_in_file               VARCHAR(100) NOT NULL
  );
```

Creating accounts to administer, and access the database via PHP

Create a database administrator account and a less capable account for the PHP server to use. Note, the passwords have been masked here, but must be fully specified when entering the actual SQL.

```
mysql> GRANT ALL PRIVILEGES ON ldrd105937.*
                                    TO 'LDRDadmin'@'localhost'
                                    IDENTIFIED BY '*********'
                                   WITH GRANT OPTION;
```

Now, I don't want the web application to have all of those capabilities, so I need to create that user, say LDRDwebbot:

```
mysql> GRANT SELECT,
                   INSERT, UPDATE, DELETE, INDEX, ALTER, CREATE, DROP
                ON ldrd105937.*
                TO 'ldrdWEBBOT'@'localhost'
                IDENTIFIED BY '**********';
```

Pre-loading the question table

Load the questions into the database. This is a lot of stuff to type, so was easier to create it in a file (LoadQuestions.txt) and load it from the file into the database. Change to the correct directory, then enter:

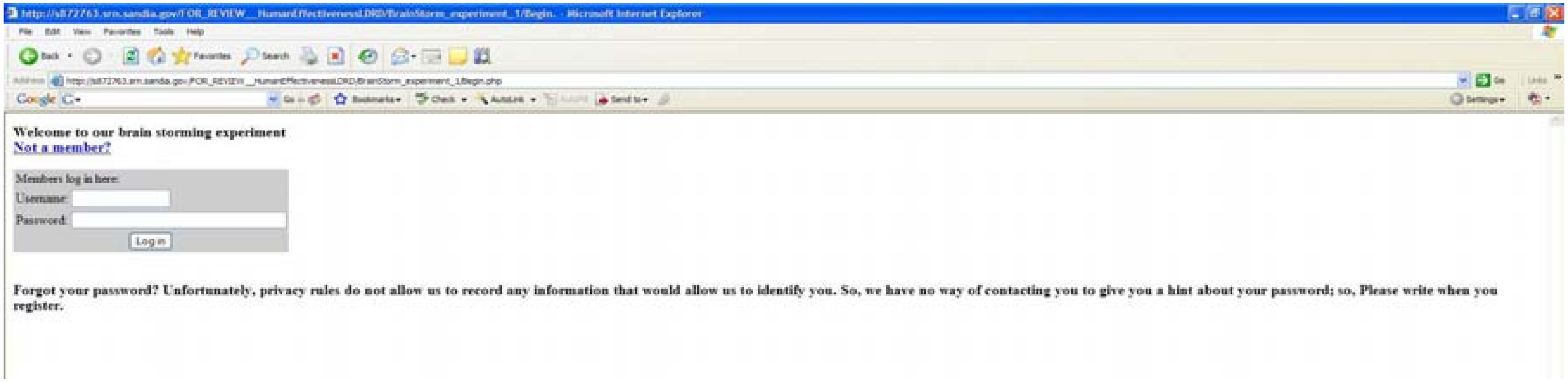
```
USE ldrd105937;

LOAD DATA LOCAL INFILE ‘LoadQuestions.txt’ INTO TABLE question FIELDS
TERMINATED BY ‘\t’ LINES TERMINATED BY ‘\n’ (question_identifier, question_text);
```

That file should be like the following:

```
Hunter <p>Tom Hunter is interested in the contrast between two models of how
organizations relate to their people. One model views people,

metaphorically, as just another natural resource, and like other natural resources, to be used
(read extracted) for the good of the organization.  In that

model obtaining people is largely a financial question and the company will derive whatever
contributions it can from their skills or experience.<p>A

second model asserts that people are an asset to be continually developed and the investment
in their development will yield a dividend to the

organization or even to the broader society. <p>In contrasting these two models, Tom is
greatly interested in your thoughts and ideas about: <ul>   <li>

how employees establish an identity for themselves in relation to their work environment,
i.e., how do they define their <em><u>we</u></em>., and  </li>

<li> how to create the appropriate balance between the role of management and the sense of
empowerment of employees.</li></ul><p>He would like your

comments and ideas about the above two questions, and also your insights into <ul><li>what
environment best supports the identification and development of

leaders.</li><ul>
Thumbs          <p>Please brainstorm about what would be different, and what you could, or
could not do if you had two opposable thumbs per hand<br>
```

Appendix II

Screen images of the main pages


http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/Begin. - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Favorites
Search
Address
http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/Begin.php
Go
Links
Google
Bookmarks
Check
AutoLink
Send to
Settings

Welcome to our brain storming experiment

Not a member?

Members log in here:

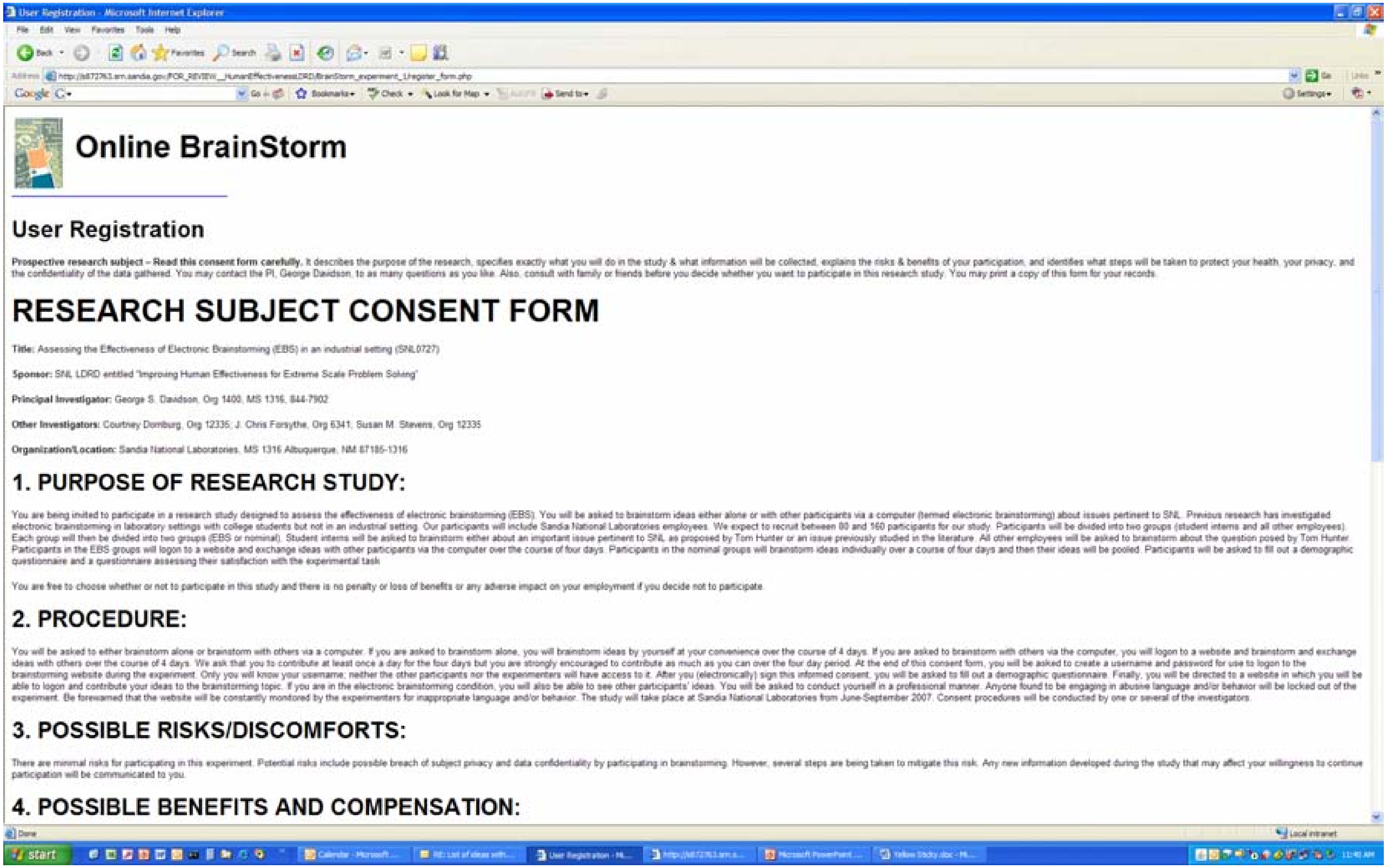
Username:

Password:

Log in

Forgot your password? Unfortunately, privacy rules do not allow us to record any information that would allow us to identify you. So, we have no way of contacting you to give you a hint about your password; so, Please write when you register.

Opening page, Begin.php



Online BrainStorm

User Registration

Prospective research subject – Read this consent form carefully. It describes the purpose of the research, specifies exactly what you will do in the study & what information will be collected, explains the risks & benefits of your participation, and identifies what steps will be taken to protect your health, your privacy, and the confidentiality of the data gathered. You may contact the PI, George Davidson, to as many questions as you like. Also, consult with family or friends before you decide whether you want to participate in this research study. You may print a copy of this form for your records.

RESEARCH SUBJECT CONSENT FORM

Title: Assessing the Effectiveness of Electronic Brainstorming (EBS) in an industrial setting (SNL0727)

Sponsor: SNL LDRD entitled "Improving Human Effectiveness for Extreme Scale Problem Solving"

Principal Investigator: George S. Davidson, Org 1400, MS 1316, 844-7902

Other Investigators: Courtney Dornburg, Org 12335; J. Chris Forsythe, Org 6341; Susan M. Stevens, Org 12335

Organization/Location: Sandia National Laboratories, MS 1316 Albuquerque, NM 87185-1316

1. PURPOSE OF RESEARCH STUDY:

You are being invited to participate in a research study designed to assess the effectiveness of electronic brainstorming (EBS). You will be asked to brainstorm ideas either alone or with other participants via a computer (termed electronic brainstorming) about issues pertinent to SNL. Previous research has investigated electronic brainstorming in laboratory settings with college students but not in an industrial setting. Our participants will include Sandia National Laboratories employees. We expect to recruit between 80 and 160 participants for our study. Participants will be divided into two groups (student interns and all other employees). Each group will then be divided into two groups (EBS or nominal). Student interns will be asked to brainstorm either about an important issue pertinent to SNL as proposed by Tom Hunter or an issue previously studied in the literature. All other employees will be asked to brainstorm about the question posed by Tom Hunter. Participants in the EBS groups will logon to a website and exchange ideas with other participants via the computer over the course of four days. Participants in the nominal groups will brainstorm ideas individually over a course of four days and then their ideas will be pooled. Participants will be asked to fill out a demographic questionnaire and a questionnaire assessing their satisfaction with the experimental task.

You are free to choose whether or not to participate in this study and there is no penalty or loss of benefits or any adverse impact on your employment if you decide not to participate.

2. PROCEDURE:

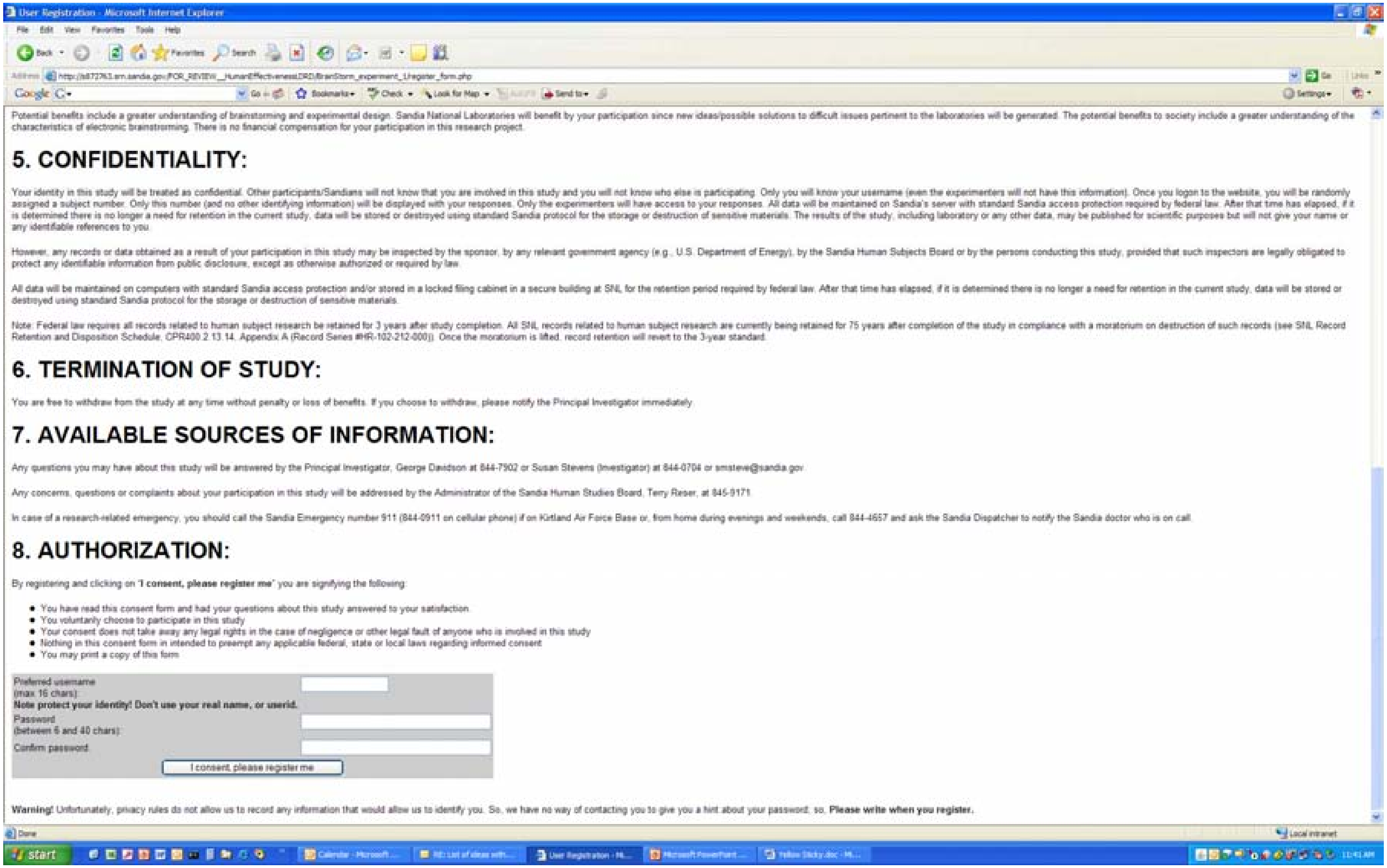
You will be asked to either brainstorm alone or brainstorm with others via a computer. If you are asked to brainstorm alone, you will brainstorm ideas by yourself at your convenience over the course of 4 days. If you are asked to brainstorm with others via the computer, you will logon to a website and brainstorm and exchange ideas with others over the course of 4 days. We ask that you to contribute at least once a day for the four days but you are strongly encouraged to contribute as much as you can over the four day period. At the end of this consent form, you will be asked to create a username and password for use to logon to the brainstorming website during the experiment. Only you will know your username; neither the other participants nor the experimenters will have access to it. After you (electronically) sign this informed consent, you will be asked to fill out a demographic questionnaire. Finally, you will be directed to a website in which you will be able to logon and contribute your ideas to the brainstorming topic. If you are in the electronic brainstorming condition, you will also be able to see other participants' ideas. You will be asked to conduct yourself in a professional manner. Anyone found to be engaging in abusive language and/or behavior will be locked out of the experiment. Be forewarned that the website will be constantly monitored by the experimenters for inappropriate language and/or behavior. The study will take place at Sandia National Laboratories from June-September 2007. Consent procedures will be conducted by one or several of the investigators.

3. POSSIBLE RISKS/DISCOMFORTS:

There are minimal risks for participating in this experiment. Potential risks include possible breach of subject privacy and data confidentiality by participating in brainstorming. However, several steps are being taken to mitigate this risk. Any new information developed during the study that may affect your willingness to continue participation will be communicated to you.

4. POSSIBLE BENEFITS AND COMPENSATION:

Consent form and authorization (top screen of two screen images), register_form.php


User Registration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Favorites
Search
http://s872763.sn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/register_form.php
Go
Links
Google
Bookmarks
Check
Look for Map
Send to
Settings
Done
Local intranet
start
Calendar - Microsoft ...
RE: List of ideas with...
User Registration - Mi...
Microsoft PowerPoint ...
Yellow Sticky.doc - Mi...

Potential benefits include a greater understanding of brainstorming and experimental design. Sandia National Laboratories will benefit by your participation since new ideas/possible solutions to difficult issues pertinent to the laboratories will be generated. The potential benefits to society include a greater understanding of the characteristics of electronic brainstroming. There is no financial compensation for your participation in this research project.

5. CONFIDENTIALITY:

Your identity in this study will be treated as confidential. Other participants/Sandians will not know that you are involved in this study and you will not know who else is participating. Only you will know your username (even the experimenters will not have this information). Once you logon to the website, you will be randomly assigned a subject number. Only this number (and no other identifying information) will be displayed with your responses. Only the experimenters will have access to your responses. All data will be maintained on Sandia's server with standard Sandia access protection required by federal law. After that time has elapsed, if it is determined there is no longer a need for retention in the current study, data will be stored or destroyed using standard Sandia protocol for the storage or destruction of sensitive materials. The results of the study, including laboratory or any other data, may be published for scientific purposes but will not give your name or any identifiable references to you.

However, any records or data obtained as a result of your participation in this study may be inspected by the sponsor, by any relevant government agency (e.g., U.S. Department of Energy), by the Sandia Human Subjects Board or by the persons conducting this study, provided that such inspectors are legally obligated to protect any identifiable information from public disclosure, except as otherwise authorized or required by law.

All data will be maintained on computers with standard Sandia access protection and/or stored in a locked filing cabinet in a secure building at SNL for the retention period required by federal law. After that time has elapsed, if it is determined there is no longer a need for retention in the current study, data will be stored or destroyed using standard Sandia protocol for the storage or destruction of sensitive materials.

Note: Federal law requires all records related to human subject research be retained for 3 years after study completion. All SNL records related to human subject research are currently being retained for 75 years after completion of the study in compliance with a moratorium on destruction of such records (see SNL Record Retention and Disposition Schedule, CPR400.2.13.14, Appendix A (Record Series #HR-102-212-000)). Once the moratorium is lifted, record retention will revert to the 3-year standard.

6. TERMINATION OF STUDY:

You are free to withdraw from the study at any time without penalty or loss of benefits. If you choose to withdraw, please notify the Principal Investigator immediately.

7. AVAILABLE SOURCES OF INFORMATION:

Any questions you may have about this study will be answered by the Principal Investigator, George Davidson at 844-7902 or Susan Stevens (Investigator) at 844-0704 or smsteve@sandia.gov.

Any concerns, questions or complaints about your participation in this study will be addressed by the Administrator of the Sandia Human Studies Board, Terry Reser, at 845-9171.

In case of a research-related emergency, you should call the Sandia Emergency number 911 (844-0911 on cellular phone) if on Kirtland Air Force Base or, from home during evenings and weekends, call 844-4657 and ask the Sandia Dispatcher to notify the Sandia doctor who is on call.

8. AUTHORIZATION:

By registering and clicking on "**I consent, please register me**" you are signifying the following:

- You have read this consent form and had your questions about this study answered to your satisfaction
- You voluntarily choose to participate in this study
- Your consent does not take away any legal rights in the case of negligence or other legal fault of anyone who is involved in this study
- Nothing in this consent form in intended to preempt any applicable federal, state or local laws regarding informed consent
- You may print a copy of this form

Preferred username
(max 16 chars):
Note protect your identity! Don't use your real name, or userid.

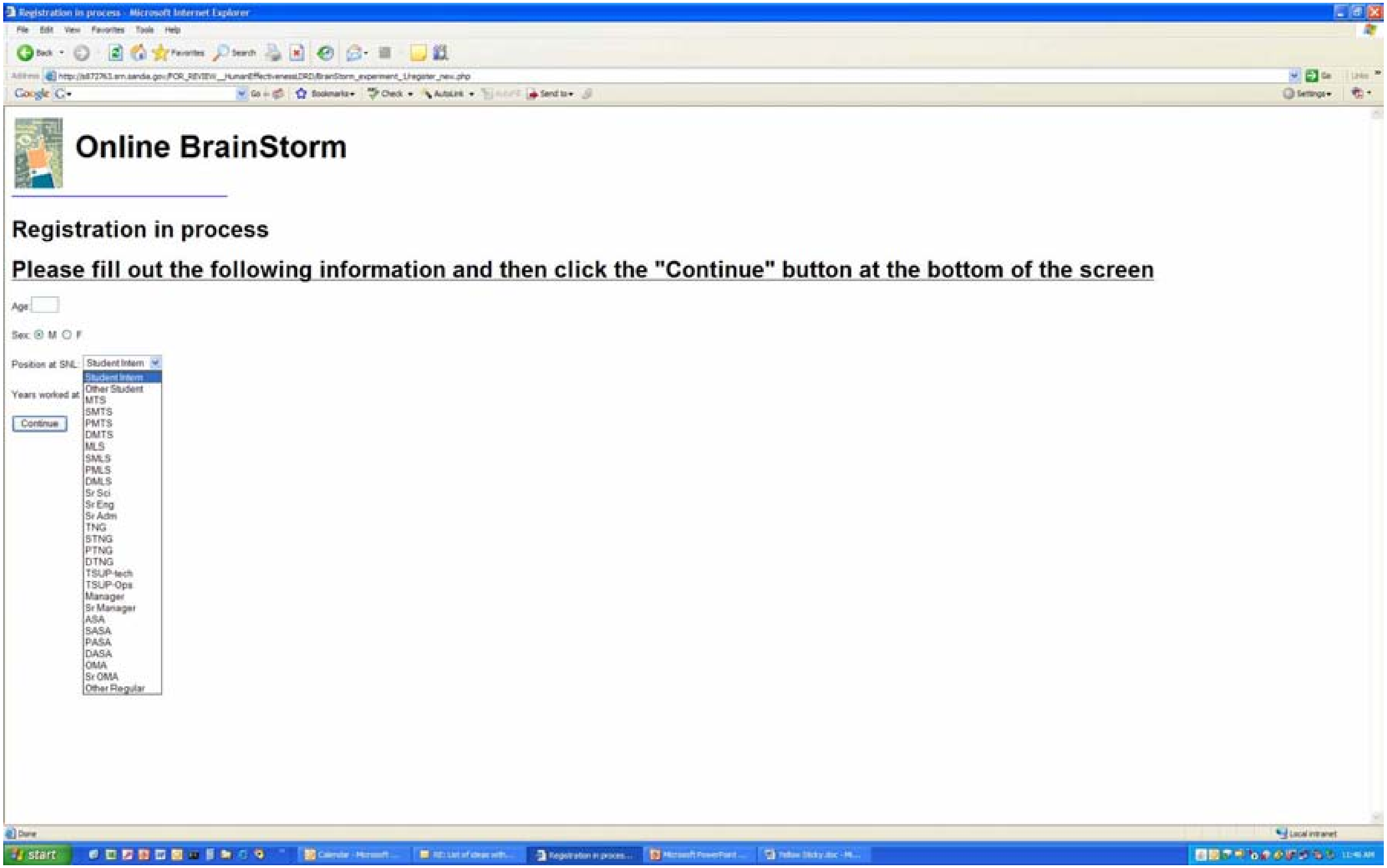
Password
(between 6 and 40 chars):

Confirm password

I consent, please register me

Warning! Unfortunately, privacy rules do not allow us to record any information that would allow us to identify you. So, we have no way of contacting you to give you a hint about your password, so, **Please write when you register.**

Consent form and authorization (spreads across two screen images), register_form.php



Registration in process - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Favorites Search
Address http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/register_new.php
Go
Bookmarks Check AutoLink Send to Settings
Student Intern
Other Student
MTS
SMTS
PMTS
DMTS
MLS
SMLS
PMLS
DMLS
Sr Sci
Sr Eng
Sr Adm
TNG
STNG
PTNG
DTNG
TSUP-tech
TSUP-Ops
Manager
Sr Manager
ASA
SASA
PASA
DASA
OMA
Sr OMA
Other Regular
Done
Local intranet
start

Online BrainStorm

Registration in process

Please fill out the following information and then click the "Continue" button at the bottom of the screen

Age □

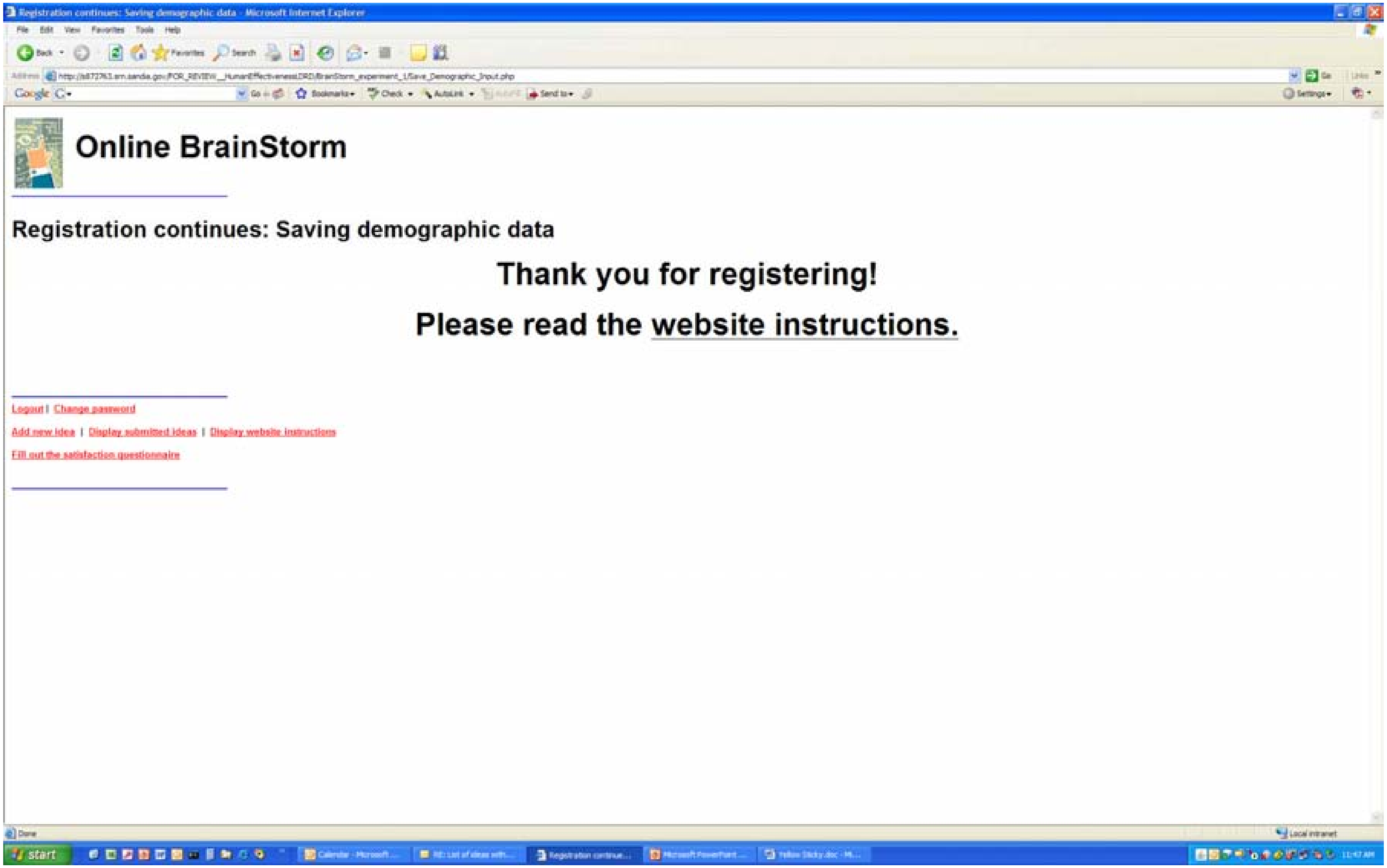
Sex: ● M ○ F

Position at SNL: Student Intern

Years worked at

Continue

Second registration step, register_new.php



Registration continues: Saving demographic data - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Favorites Search
Address
Google
Go Bookmarks Check AutoLink Send to
Settings
Done
Local intranet
start

http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/Save_Demographic_Input.php

Online BrainStorm

Registration continues: Saving demographic data

Thank you for registering!

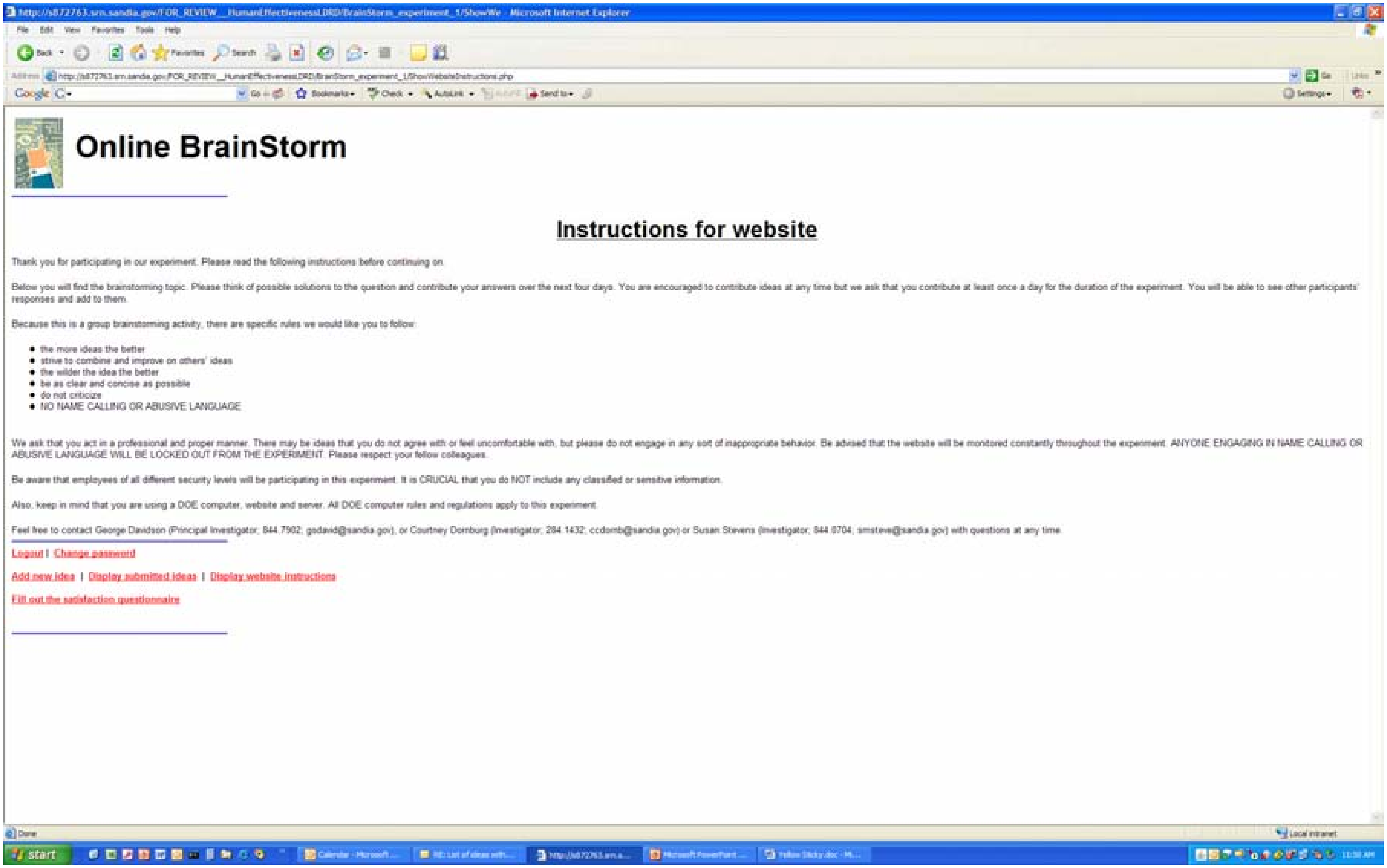
Please read the website instructions.

Logout | Change password

Add new idea | Display submitted ideas | Display website instructions

Fill out the satisfaction questionnaire

Successful registration notification, note link to website instructions and menu at bottom. Save_Demographic_Input.php


http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/ShowWe - Microsoft Internet Explorer
Online BrainStorm

Instructions for website

Thank you for participating in our experiment. Please read the following instructions before continuing on.

Below you will find the brainstorming topic. Please think of possible solutions to the question and contribute your answers over the next four days. You are encouraged to contribute ideas at any time but we ask that you contribute at least once a day for the duration of the experiment. You will be able to see other participants' responses and add to them.

Because this is a group brainstorming activity, there are specific rules we would like you to follow:

- the more ideas the better
- strive to combine and improve on others' ideas
- the wilder the idea the better
- be as clear and concise as possible
- do not criticize
- NO NAME CALLING OR ABUSIVE LANGUAGE

We ask that you act in a professional and proper manner. There may be ideas that you do not agree with or feel uncomfortable with, but please do not engage in any sort of inappropriate behavior. Be advised that the website will be monitored constantly throughout the experiment. ANYONE ENGAGING IN NAME CALLING OR ABUSIVE LANGUAGE WILL BE LOCKED OUT FROM THE EXPERIMENT. Please respect your fellow colleagues.

Be aware that employees of all different security levels will be participating in this experiment. It is CRUCIAL that you do NOT include any classified or sensitive information.

Also, keep in mind that you are using a DOE computer, website and server. All DOE computer rules and regulations apply to this experiment.

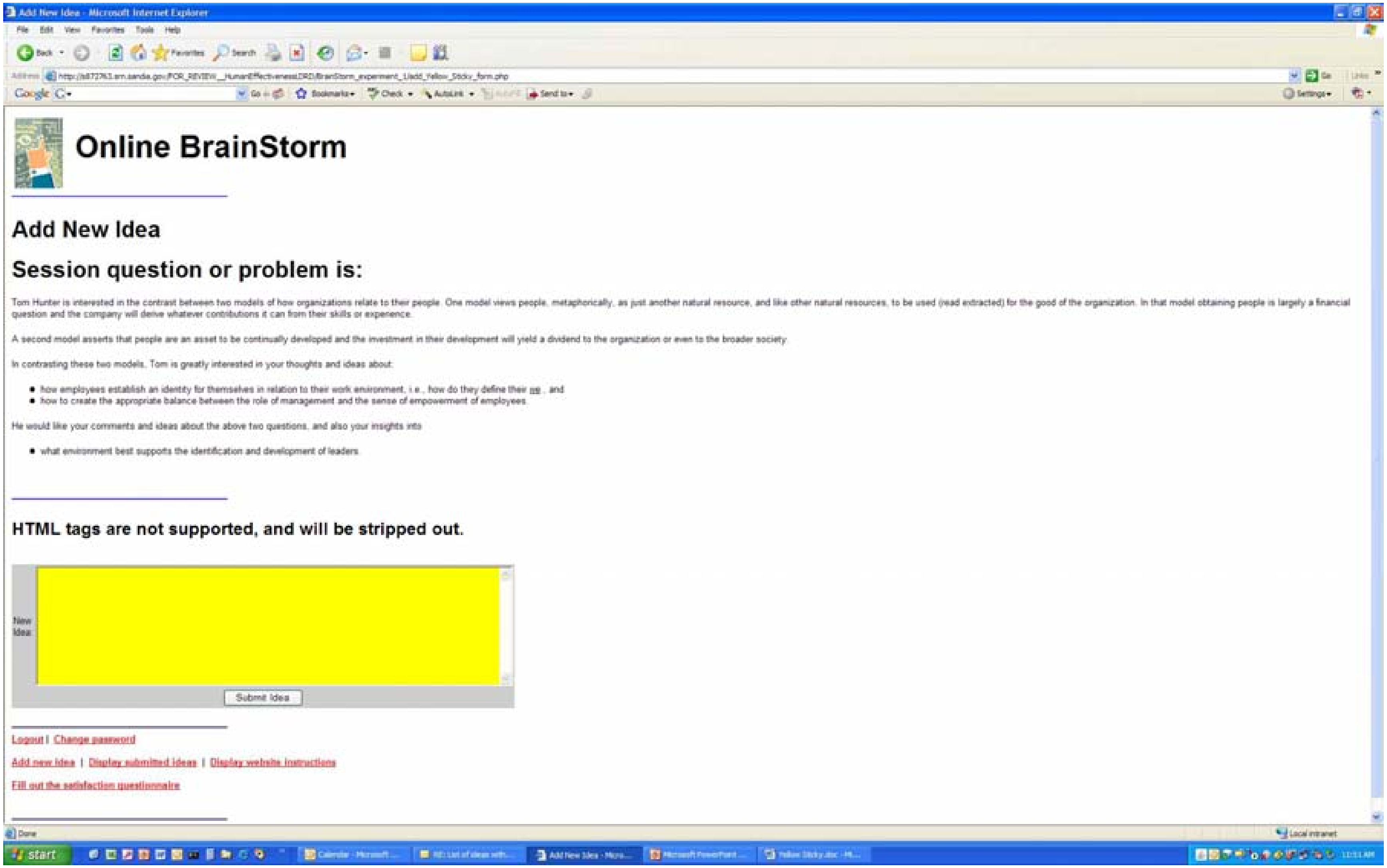
Feel free to contact George Davidson (Principal Investigator; 844.7902; gsdavid@sandia.gov), or Courtney Dornburg (Investigator; 284.1432; ccdornb@sandia.gov) or Susan Stevens (Investigator; 844.0704; smsteve@sandia.gov) with questions at any time.

Logout | Change password

Add new idea | Display submitted ideas | Display website instructions

Fill out the satisfaction questionnaire

Instructions for website and brainstorming suggestions, ShowWebsiteInstructions.php



Add New Idea - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Favorites Search
Address http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/add_Yellow_Sticky_form.php
Go
Bookmarks Check AutoLink Send to Settings
Done
Local intranet
start

Online BrainStorm

Add New Idea

Session question or problem is:

Tom Hunter is interested in the contrast between two models of how organizations relate to their people. One model views people, metaphorically, as just another natural resource, and like other natural resources, to be used (read extracted) for the good of the organization. In that model obtaining people is largely a financial question and the company will derive whatever contributions it can from their skills or experience.

A second model asserts that people are an asset to be continually developed and the investment in their development will yield a dividend to the organization or even to the broader society.

In contrasting these two models, Tom is greatly interested in your thoughts and ideas about:

- how employees establish an identity for themselves in relation to their work environment, i.e., how do they define their we , and
- how to create the appropriate balance between the role of management and the sense of empowerment of employees.

He would like your comments and ideas about the above two questions, and also your insights into

- what environment best supports the identification and development of leaders.

HTML tags are not supported, and will be stripped out.

New Idea

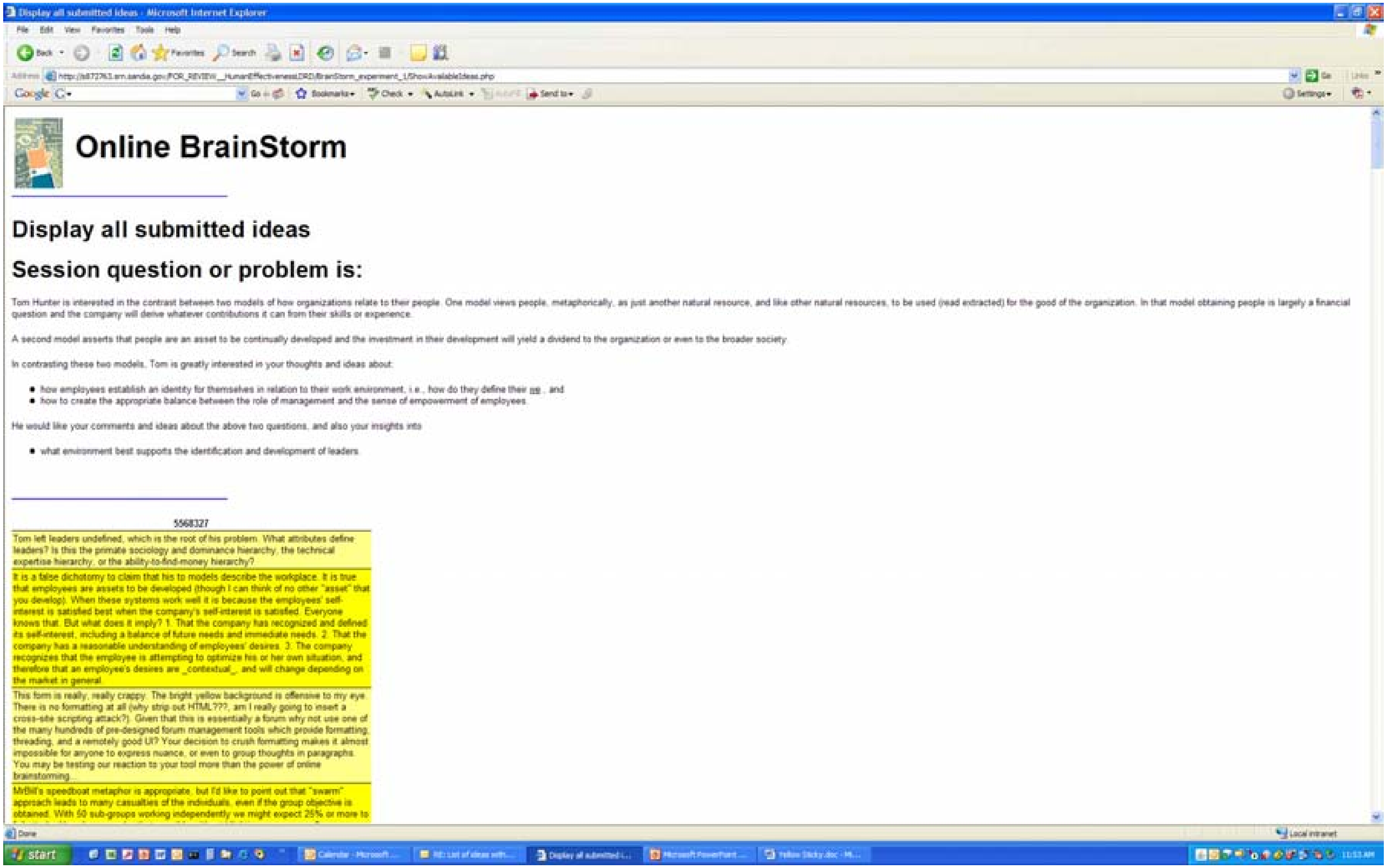
Submit Idea

Logout | Change password

Add new idea | Display submitted ideas | Display website instructions

Fill out the satisfaction questionnaire

Form to add a new idea (yellow sticky), add_Yellow_Sticky_form.php


Display all submitted ideas - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Favorites Search
Done
Local intranet
start

Online BrainStorm

Display all submitted ideas

Session question or problem is:

Tom Hunter is interested in the contrast between two models of how organizations relate to their people. One model views people, metaphorically, as just another natural resource, and like other natural resources, to be used (read extracted) for the good of the organization. In that model obtaining people is largely a financial question and the company will derive whatever contributions it can from their skills or experience.

A second model asserts that people are an asset to be continually developed and the investment in their development will yield a dividend to the organization or even to the broader society.

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- how to create the appropriate balance between the role of management and the sense of empowerment of employees.

He would like your comments and ideas about the above two questions, and also your insights into

- what environment best supports the identification and development of leaders.

5568327

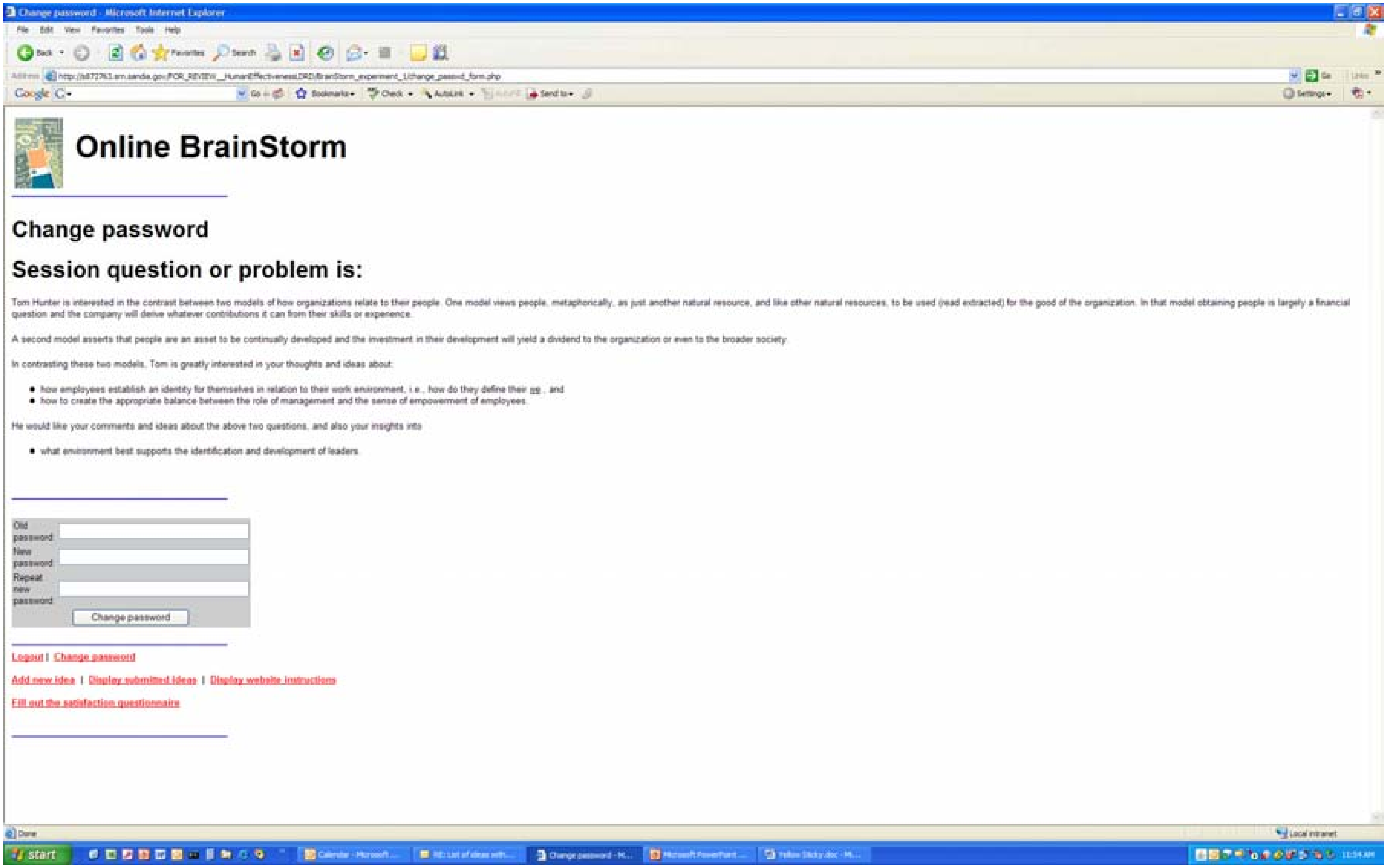
Tom left leaders undefined, which is the root of his problem. What attributes define leaders? Is this the primate sociology and dominance hierarchy, the technical expertise hierarchy, or the ability-to-find-money hierarchy?

It is a false dichotomy to claim that his to models describe the workplace. It is true that employees are assets to be developed (though I can think of no other "asset" that you develop). When these systems work well it is because the employees' self-interest is satisfied best when the company's self-interest is satisfied. Everyone knows that. But what does it imply? 1. That the company has recognized and defined its self-interest, including a balance of future needs and immediate needs. 2. That the company has a reasonable understanding of employees' desires. 3. The company recognizes that the employee is attempting to optimize his or her own situation, and therefore that an employee's desires are _contextual_, and will change depending on the market in general.

This form is really, really crappy. The bright yellow background is offensive to my eye. There is no formatting at all (why strip out HTML???, am I really going to insert a cross-site scripting attack?). Given that this is essentially a forum why not use one of the many hundreds of pre-designed forum management tools which provide formatting, threading, and a remotely good UI? Your decision to crush formatting makes it almost impossible for anyone to express nuance, or even to group thoughts in paragraphs. You may be testing our reaction to your tool more than the power of online brainstorming...

MrBill's speedboat metaphor is appropriate, but I'd like to point out that "swarm" approach leads to many casualties of the individuals, even if the group objective is obtained. With 50 sub-groups working independently we might expect 25% or more to

Displaying the submitted ideas, note that this is the top of a long list, with the standard menu at the bottom of the list, ShowAvailableIdeas.php



Online BrainStorm

Change password

Session question or problem is:

Tom Hunter is interested in the contrast between two models of how organizations relate to their people. One model views people, metaphorically, as just another natural resource, and like other natural resources, to be used (read extracted) for the good of the organization. In that model obtaining people is largely a financial question and the company will derive whatever contributions it can from their skills or experience.

A second model asserts that people are an asset to be continually developed and the investment in their development will yield a dividend to the organization or even to the broader society.

In contrasting these two models, Tom is greatly interested in your thoughts and ideas about:

- how employees establish an identity for themselves in relation to their work environment, i.e., how do they define their ~~se~~ , and
- how to create the appropriate balance between the role of management and the sense of empowerment of employees.

He would like your comments and ideas about the above two questions, and also your insights into

- what environment best supports the identification and development of leaders

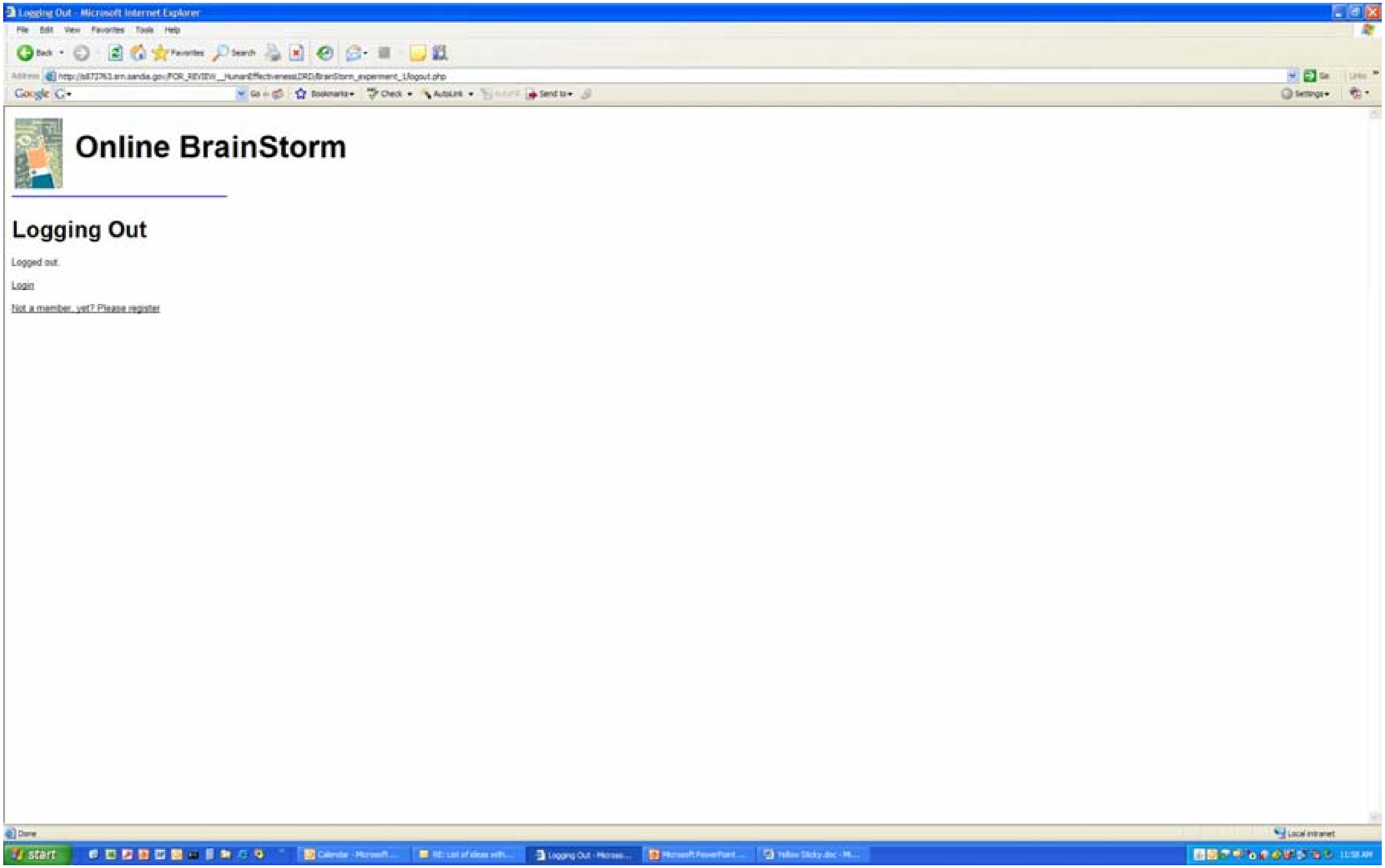
Old password	
New password	
Repeat new password	
	Change password

Logout | Change password

Add new idea | Display submitted ideas | Display website instructions

Fill out the satisfaction questionnaire

Changing one’s password, change_passwd_form.php


Logging Out - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Favorites Search
Address http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/logout.php
Go Links
Google Go Bookmarks Check AutoLink Send to Settings
Done
Local intranet
start
Calendar - Microsoft ...
RE: List of ideas with...
Logging Out - Micros...
Microsoft PowerPoint ...
Yellow Sticky.doc - Mi...
11:58 AM

Online BrainStorm

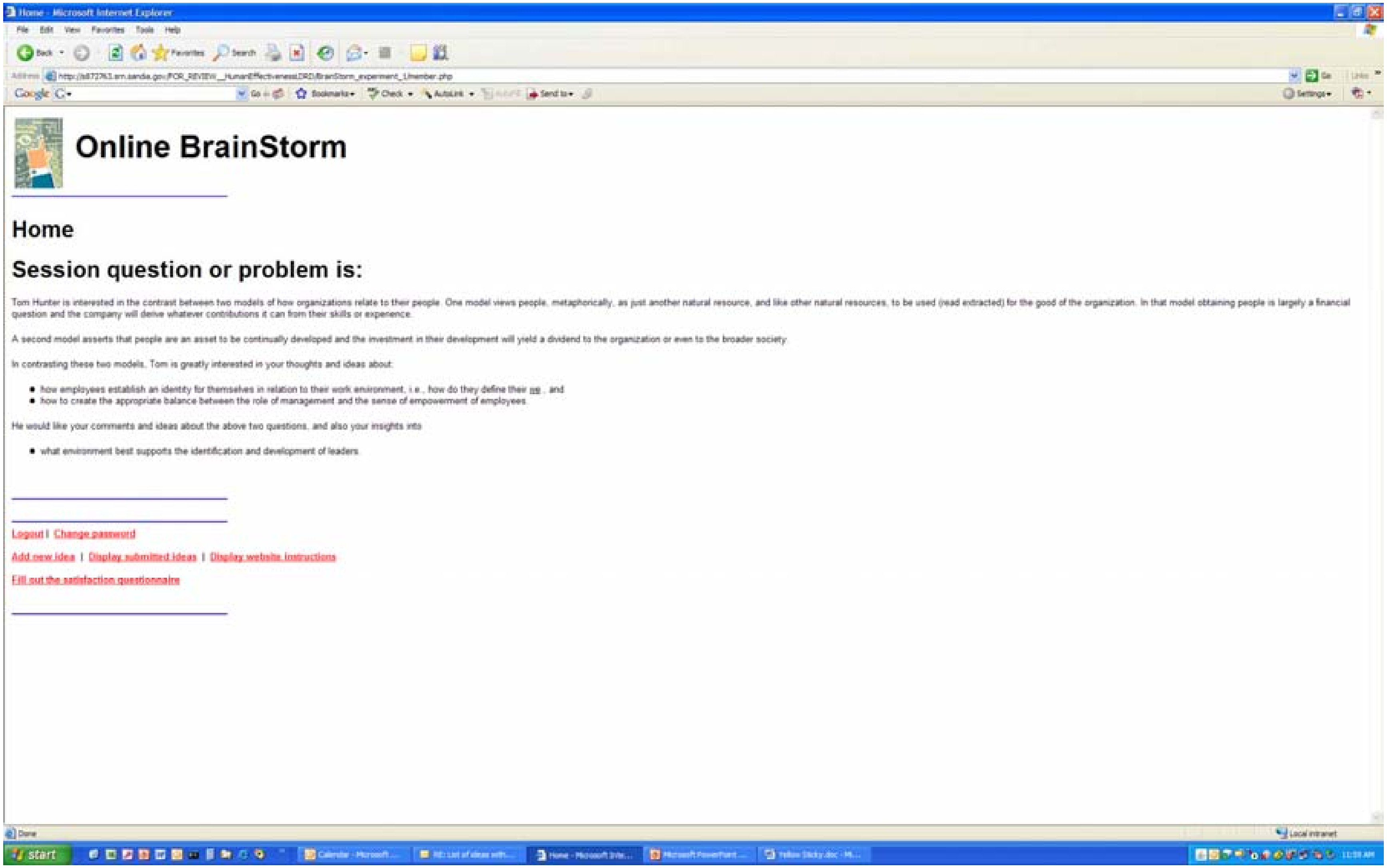
Logging Out

Logged out.

Login

Not a member, yet? Please register

After selecting to logout option from the menu, logout.php



Online BrainStorm

Home

Session question or problem is:

Tom Hunter is interested in the contrast between two models of how organizations relate to their people. One model views people, metaphorically, as just another natural resource, and like other natural resources, to be used (read extracted) for the good of the organization. In that model obtaining people is largely a financial question and the company will derive whatever contributions it can from their skills or experience.

A second model asserts that people are an asset to be continually developed and the investment in their development will yield a dividend to the organization or even to the broader society.

In contrasting these two models, Tom is greatly interested in your thoughts and ideas about:

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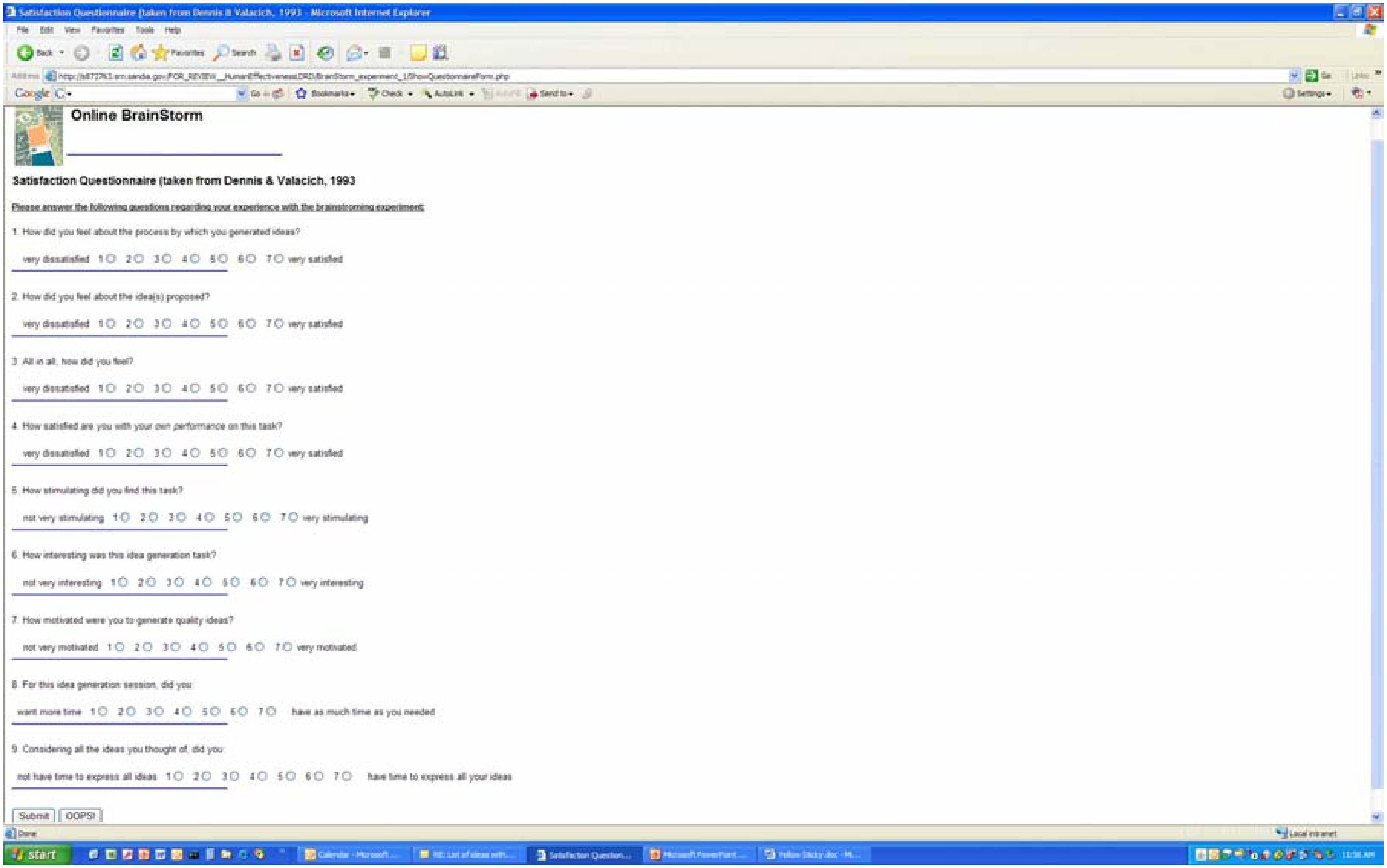
- how to create the appropriate balance between the role of management and the sense of empowerment of employees.

He would like your comments and ideas about the above two questions, and also your insights into

- what environment best supports the identification and development of leaders

Home - Microsoft Internet Explorer
Logout | Change password
Add new idea | Display submitted ideas | Display website instructions
Fill out the satisfaction questionnaire
Done
Local intranet
start

Returning participant, the view when logging in after a previous registration session, member.php



Satisfaction Questionnaire (taken from Dennis & Valacich, 1993 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Favorites
Search
Address http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/ShowQuestionnaireForm.php
Go
Bookmarks
Check
AutoLink
Send to
Settings
Done
Local intranet
start
Calendar - Microsoft ...
RE: List of ideas with...
Satisfaction Question...
Microsoft PowerPoint ...
Yellow Sticky.doc - Mi...

Online BrainStorm

Satisfaction Questionnaire (taken from Dennis & Valacich, 1993

Please answer the following questions regarding your experience with the brainstorming experiment:

1. How did you feel about the process by which you generated ideas?

very dissatisfied 1○ 2○ 3○ 4○ 5○ 6○ 7○ very satisfied

2. How did you feel about the idea(s) proposed?

very dissatisfied 1○ 2○ 3○ 4○ 5○ 6○ 7○ very satisfied

3. All in all, how did you feel?

very dissatisfied 1○ 2○ 3○ 4○ 5○ 6○ 7○ very satisfied

4. How satisfied are you with your own performance on this task?

very dissatisfied 1○ 2○ 3○ 4○ 5○ 6○ 7○ very satisfied

5. How stimulating did you find this task?

not very stimulating 1○ 2○ 3○ 4○ 5○ 6○ 7○ very stimulating

6. How interesting was this idea generation task?

not very interesting 1○ 2○ 3○ 4○ 5○ 6○ 7○ very interesting

7. How motivated were you to generate quality ideas?

not very motivated 1○ 2○ 3○ 4○ 5○ 6○ 7○ very motivated

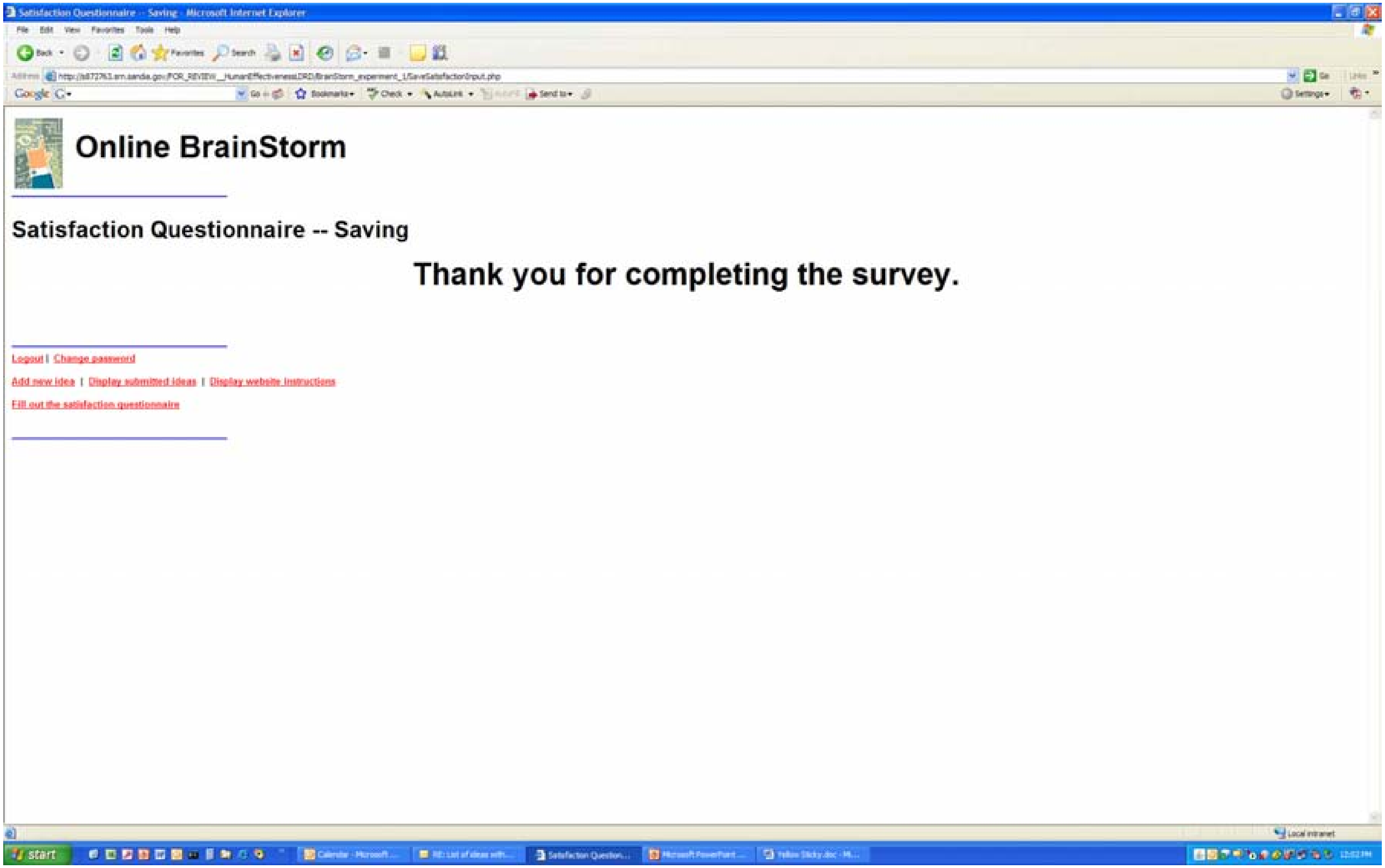
8. For this idea generation session, did you:

want more time 1○ 2○ 3○ 4○ 5○ 6○ 7○ have as much time as you needed

9. Considering all the ideas you thought of, did you:

not have time to express all ideas 1○ 2○ 3○ 4○ 5○ 6○ 7○ have time to express all your ideas

Satisfaction survey, ShowQuestionnaireForm


Satisfaction Questionnaire -- Saving - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Favorites
Search
Address http://s872763.srn.sandia.gov/FOR_REVIEW__HumanEffectivenessLDRD/BrainStorm_experiment_1/SaveSatisfactionInput.php
Go
Google
Bookmarks
Check
AutoLink
Send to
Settings
Local intranet
start

Online BrainStorm

Satisfaction Questionnaire -- Saving

Thank you for completing the survey.

Logout | Change password

Add new idea | Display submitted ideas | Display website instructions

Fill out the satisfaction questionnaire

Notification that the questionnaire results were saved, SaveSatisfactionInput.php

Appendix III

PHP implementation

(note: please expect some formatting difficulties due to page sizes)

File	Brief summary	See pages
Begin.php	Entry page for the system	15, 29
register_form.php	Consent & user/password	16-17, 30
register_new.php	Registration, demographic data	18, 31
Save_Demographic_Input.php	Verify demographic input & update database	19, 34
ShowWebsiteInstructions.php	Explain brainstorming rules	20, 37
member.php	Main returning page for registered users	25, 38
change_passwd_form.php	Requires knowledge of prior password	23, 40
change_passwd.php	Verifies input from form & updates password	41
ShowAvailableIdeas.php	List ideas (depends on group assignment)	22, 43
add_Yellow_Sticky_form.php	Blank yellow sticky form for a new idea	21, 45
add_Yellow_Sticky_New_Idea.php	Escape user data before updating database	46
ShowQuestionnaireForm.php	Ask user to fill out satisfaction questionnaire	26, 47
SaveSatisfactionInput.php	Verify input from questionnaire & update db	27, 48
logout.php	End session and log user out	24, 53
db_fns.php	Utility to connect to database	54
user_auth_fns.php	Utility to verify valid user	55
url_fns.php	Utility to update ideas in the database	62
functions.php	Most of the utility functions	64

Begin.php

```
<?php

//FILE:   Begin.php  FORM

// include function files for this application
  require_once('functions.php');

  session_start();
  display_site_info();
  display_login_form();
  make_log_entry(annonymous, BeginHomePage, Begin.php,
  'Homepage accessed. The username is not available until they login');

?>
```

register_form.php

```
<?php
 //FILE:   register_form.php
 //        THIS IS A FORM, but it doesn't accept any POST data itself !

 require_once('functions.php');
 do_html_header('User Registration', 'WITHOUT QUESTION');

 display_registration_form();

 do_html_footer();
?>
```

register_new.php

```
<?php
  // include function files for this application
  require_once('functions.php');


//check user input for mistakes or malicious input:
// __________check username ________
if( !ereg('^[[:alnum:]]+$', $_POST['username'], $matches) ){
    //make sure at least the front part matches
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please use only alphanumeric characters in username.</b>';
    do_html_url('register_form.php', 'Register');
    do_html_footer();
    exit;
}

// __________check passwd ________
if( !ereg('^[[:alnum:]]+$', $_POST['passwd'], $matches) ){
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please use only alphanumeric characters in password.</b>';
    do_html_url('register_new.php', 'Register');
    do_html_footer();
    exit;
}

// __________check passwd2 ________
if( !ereg('^[[:alnum:]]+$', $_POST['passwd2'], $matches) ){
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please use only alphanumeric characters in password2.</b>';
    do_html_url('register_new.php', 'Register');
    do_html_footer();
    exit;
}

//____OK, have acceptable user input...continue with rest of checking______


  //create short variable names
  $username=$_POST['username'];
  $passwd=$_POST['passwd'];
  $passwd2=$_POST['passwd2'];

if(strlen($username) > 16){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";
    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please use 16, or fewer, alphanumeric characters in username.</b>';
    do_html_url('register_new.php', 'Register');
    do_html_footer();
    exit;
}
if(strlen($passwd) > 40){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";
    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please use 40, or fewer, alphanumeric characters in password.</b>';
    do_html_url('register_new.php', 'Register');
    do_html_footer();
    exit;
}
if(strlen($passwd2) > 40){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";
    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please use 40, or fewer, alphanumeric characters
             in password2.</b>';
    do_html_url('register_new.php', 'Register');
    do_html_footer();
    exit;
}



  do_html_header("Registration in process", 'WITHOUT QUESTION');

  // start session which may be needed later
  // start it now because it must go before headers
  session_start();
  try
  {
    // check forms filled in
    if (!filled_out($_POST))
    {
      throw new Exception('<h2>You have not filled the form out correctly'
              . ' - <a href=register_form.php> please try again</a>.</h2>');
    }

    //gsd: 6/8/07 -- the brain storm application does not use email !
    $email = 'notAvailable';

    // email address not valid
    //if (!valid_email($email))
    //{
    //  throw new Exception('<h2>That is not a valid email address. '
         . '- <a href=register_form.php> please try again</a>.</h2>.');
    //}
    // passwords not the same
    if ($passwd != $passwd2)
    {
      throw new Exception('<h2>The passwords you entered do not match '
            . '- <a href=register_form.php> please try again</a>.</h2>');
    }
    //echo "\n<!-- after passwords equal -->\n";


    // check password length is ok
    // ok if username truncates, but passwords will get
    // munged if they are too long.
    if (strlen($passwd)<6 || strlen($passwd) >40)
    {
      throw new Exception('<h2>Your password must be between 6 and 40'
                        . ' characters - <a href=register_form.php> '
                        .  'please try again</a>.</h2>');
    }
    //echo "\n<!-- after password length check -->\n";



    // attempt to register
    // this function can also throw an exception
    register($username, $email, $passwd);
    //echo "\n<!-- after register function call -->\n";

    // register session variable
    $_SESSION['valid_user'] = $username;

    display_demographic_form('Registration requires demographic input');
  }
  catch (Exception $e)
  {
     //do_html_header('Problem:');
     echo "<h2>There was a problem with your registration input:</H2><br>\n";
     echo $e->getMessage();
     do_html_footer();
     exit;
  }

?>
```

Save_Demographic_Input.php

```
<?php
      //FILE: Save_Demographic_Input.php FORM
      //    accepts POST INPUTS:
      //          Age, Sex, PositionAtSNL, YearsWorkedAtSNL

  // include function files for this application
  require_once('functions.php');


//check user input for mistakes or malicious input:
// __________check age ________
if( !ereg('^[[:digit:]]{2}$', trim($_POST['Age']), $matches) ){
    //make sure at least the front part matches
    //echo '<h2> Age is '.trim($_POST['Age'])."<br>\n";
    echo "\n<!-- unsuccessful registration Part 2, ";
    echo "see Save_Demographic_Input.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'Your registeration could not be completed.
          <b>Age should be numeric greater than 15.</b>';

    display_demographic_form('Registration requires demographic input');
    do_html_footer();
    exit;
}

// __________check Sex ________
if( !ereg('^[M|F]$', $_POST['Sex'], $matches) ){
    echo "\n<!-- unsuccessful registration, see register_new.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be registered.
          <b>Please only use M or F for Sex.</b>';

    display_demographic_form('Registration requires demographic input');

    do_html_footer();
    exit;
}
// __________ PositionAtSNL ________
if( !ereg('^[a-zA-Z]+((-| )[a-zA-Z]+)*$', trim($_POST['PositionAtSNL']),
$matches) ){
    //make sure at least the front part matches
    //echo '<h2> Position At SNL is'
    //    .trim($_POST['PositionAtSNL'])."<br></h2>\n";
    //$result = ereg('^[a-zA-Z]+((-| )[a-zA-Z]+)*$',
trim($_POST['PositionAtSNL']), $matches);
    //echo '<h2> result='.$result.' match is |'.$matches[0]."|</h2><br>\n";

    echo "\n<!-- unsuccessful registration Part 2, see "
         "Save_Demographic_Input.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'Your registration could not be completed.<br>';
    echo '<b>Position at SNL was not recognized.</b>';
    display_demographic_form('Registration requires demographic input');

    do_html_footer();
    exit;
}


// __________ YearsWorkedAtSNL ________
if( !ereg('^[0-9]{1,2}$', $_POST['YearsWorkedAtSNL'], $matches) ){
    //make sure at least the front part matches
    echo "\n<!-- unsuccessful registration Part 2, see ";
    echo "Save_Demographic_Input.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'Your registeration could not be completed.
          <b>Years worked at SNL should be numeric greater than 0.</b>';
    display_demographic_form('Registration requires demographic input');

    do_html_footer();
    exit;
}


//____OK, have acceptable user input...continue with rest of checking____




  do_html_header("Registration continues: Saving demographic data",
                 "WITHOUT QUESTION");

  echo "<!-- from FILE: Save_Demographic_input.php -->\n";

  //start session which may be needed later
  //start it now because it must go before headers
  session_start();

  //create short variable names
  $username         = $_SESSION['valid_user'];
  $Age              = $_POST['Age'];
  $Sex              = $_POST['Sex'];
  $PositionAtSNL    = $_POST['PositionAtSNL'];
  $YearsWorkedAtSNL = $_POST['YearsWorkedAtSNL'];



  try{ // check forms filled in correctly.
       // Note, only Age and YearsWorkedAtSNL are actually entered by user
    if ( !( is_numeric($Age) && is_numeric($YearsWorkedAtSNL) ) ){
      throw new Exception(
     'Age and Years Worked At SNL should be valid whole, positive
numbers.');
    }
    if( $Age<15 || $YearsWorkedAtSNL < 1){
      throw new Exception(
  'Age must be greater than 15 and Years Worked At SNL must be more than
0');
    }
  }
  catch (Exception $e){
    echo "<h1> There was a problem with your registration
input:</h1><br>\n";
    echo '<p><h2>' . $e->getMessage() . "-- please try again</h2>\n";
    display_demographic_form( $e->getMessage() );
  }


  //echo "\n<!-- after filled_out check-->\n";
  //echo "<h2> after checking values</h2>\n";


  try{ // attempt to finish the registration
    // this function can also throw an exception
    // see user_auth_fns.php for the definition of this function.
    add_demographic_data_to_registration( $username, $Age, $Sex,
                                $PositionAtSNL, $YearsWorkedAtSNL);
    //echo "\n<!-- after add_demographic_data_to_registration call -->\n";
  }
  catch (Exception $e){
     //do_html_header('Problem:');
     echo "<h2>There was a problem with your registration
input:</H2><br>\n";
     echo $e->getMessage();
     do_html_footer();
     exit;
  }


  echo "<center><h1> Thank you for registering!<p> Please read the ";
  echo "<a href=\"ShowWebsiteInstructions.php\"</a>";
  echo "website instructions.</a></h1></center>\n";
  echo "<br><br><br>\n";
  display_user_menu();
  do_html_footer();

?>
```

ShowWebsiteInstructions.php

```
<?php
//FILE:  ShowWebsiteInstructions.php


 //GSD:  July 23, 2007.


 require_once('functions.php');
 session_start();

  do_html_header('', 'WithoutQuestion');


  include_instructions_for_website_message();
  display_user_menu();
  do_html_footer();

?>
```

member.php

```
<?php

//FILE:   member.php  FORM !
//        ACCEPTS POST DATA
//                username
//                passwd
//          I'm only going to allow these to include [0-9] [a-z] [A-Z] no
//          blanks, or special chars.
//          With this restriction, php and html tags cannot be include
//_____________________________________________________________

// include function files for this application
require_once('functions.php');
session_start();

//check user input for mistakes or malicious input:
// __________check username ________
if( !ereg('^[[:alnum:]]+$', $_POST['username'], $matches) ){
   //make sure at least the front part matches
    echo "\n<!-- unsuccessful login, see member.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be logged in.
          <b>Please use only alphanumeric characters in username.</b>';
    do_html_url('begin.php', 'Login');
    do_html_footer();
    exit;
}
//check user input for mistakes or malicious input:
// __________check passwd ________
if( !ereg('^[[:alnum:]]+$', $_POST['passwd'], $matches) ){
    echo "\n<!-- unsuccessful login, see member.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be logged in.
          <b>Please use only alphanumeric characters in password.</b>';
    do_html_url('begin.php', 'Login');
    do_html_footer();
    exit;
}

//___OK, have acceptable user input...continue with rest of checking____

//create short variable names
$username = $_POST['username'];
$passwd = $_POST['passwd'];

if(strlen($username) > 16){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful login, see member.php -->\n";
    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be logged in.
          <b>Please use 16, or fewer, alphanumeric characters
```

```
         in username.</b>';
    do_html_url('begin.php', 'Login');
    do_html_footer();
    exit;
}
if(strlen($passwd) > 40){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful login, see member.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be logged in.
          <b>Please use 40, or fewer, alphanumeric characters
          in username.</b>';
    do_html_url('begin.php', 'Login');
    do_html_footer();
    exit;
}


if ($username && $passwd)
// they have just tried logging in
{
  echo "\n<!-- trying login; see, member.php -->\n";
  try
  {
    login($username, $passwd);
    // if they are in the database register the user id
    $_SESSION['valid_user'] = $username;
  }
  catch(Exception $e)
  {
    // unsuccessful login
    echo "\n<!-- unsuccessful login, see member.php -->\n";

    do_html_header('Problem:', "WITHOUT QUESTION");
    echo 'You could not be logged in. Either username or password '
        .'was incorrect, OR <br>'
        .'you still need to <a
href="register_form.php">register</a>.<br>';
    do_html_url('begin.php', 'Login');
    do_html_footer();
    exit;
  }
}
echo "\n<!-- after if(username && passwd -->\n";

do_html_header('Home');
echo "\n<!-- after do_html -->\n";

check_valid_user();
echo '<br>';
echo "\n<!-- check_valid_user -->\n";

// give menu of options
display_user_menu();
do_html_footer();
?>
```

change_passwd_form.php

```
<?php
 require_once('functions.php');
 session_start();
 do_html_header('Change password');
 check_valid_user();

 display_password_form();

 display_user_menu();
 do_html_footer();
?>
```

change_passwd.php

```
<?php
  require_once('functions.php');
  session_start();
  do_html_header('Changing password', "WITHOUT QUESTION");

  //check user input for mistakes or malicious input:
  // __________check old_passwd ________
  if( !ereg('^[[:alnum:]]+$', $_POST['old_passwd'], $matches) ){
    //make sure at least the front part matches
    echo "\n<!-- unsuccessful attempt to change password, see "
         "change_passwd.php -->\n";
    echo '<p>You did not change the password. Problem was with old_passwd.
          <p><b>Please use only alphanumeric characters in passwords.</b>
          <p><hr><br>';
    do_html_url('change_passwd_form.php', 'Change Password');
    do_html_footer();
    exit;
  }

  // __________check passwd ________
  if( !ereg('^[[:alnum:]]+$', $_POST['new_passwd'], $matches) ){
    echo "\n<!-- unsuccessful attempt to change password, "
         " see change_passwd.php -->\n";
    echo '<p>You did not change the password. Problem was with passwd.
          <p><b>Please use only alphanumeric characters in passwords.</b>
          <p><hr><br>';
    do_html_url('change_passwd_form.php', 'Change Password');
    do_html_footer();
    exit;
  }

  // __________check passwd2 ________
  if( !ereg('^[[:alnum:]]+$', $_POST['new_passwd2'], $matches) ){
    echo "\n<!-- unsuccessful attempt to change password, see "
         "change_passwd.php -->\n";
    echo '<p>You did not change the password. Problem was with passwd2.
          <p><b>Please use only alphanumeric characters in passwords.</b>
          <p><hr><br>';
    do_html_url('change_passwd_form.php', 'Change Password');
    do_html_footer();
    exit;
  }

  //__OK, have acceptable user input...continue with rest of checking__
  //echo "<p>OK acceptable input\n";

  // create short variable names
  $old_passwd = $_POST['old_passwd'];
  $new_passwd = $_POST['new_passwd'];
  $new_passwd2 = $_POST['new_passwd2'];

  $len = strlen($old_passwd);
  if(($len < 6)  || ($len > 40)){
     //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful attempt to change password, see "
         "change_passwd.php -->\n";
    echo '<p>You did not change the password. Problem was with password.
          <p><b>Please use at least 6, not more than 40,
          alphanumeric characters in passwords.</b><p><hr><br>';
    do_html_url('change_passwd_form.php', 'Change Password');
    do_html_footer();
    exit;
  }

  $len = strlen($new_passwd);
  if($len < 6  || $len > 40){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful attempt to change password, see "
         "change_passwd.php -->\n";
    echo '<p>You did not change the password. Problem was with new_passwd.
          <p><b>Please use at least 6, not more than 40,
          alphanumeric characters in passwords.</b><p><hr><br>';
    do_html_url('change_passwd_form.php', 'Change Password');
    do_html_footer();
    exit;
  }

  $len = strlen($new_passwd2);
  if($len < 6  || $len > 40){
    //don't even log this attempt...it is still not in the valid form
    echo "\n<!-- unsuccessful attempt to change password, see "
         "change_passwd.php -->\n";
    echo '<p>You did not change the password. Problem was with
new_passwd2.
          <p><b>Please use at least 6, not more than 40,
          alphanumeric characters in passwords.</b><p><hr><br>';
    do_html_url('change_passwd_form.php', 'Change Password');
    do_html_footer();
    exit;
  }
  try{
    check_valid_user();

    if ($new_passwd != $new_passwd2) throw
       new Exception('Passwords entered were not the same.  Not
changed.');

    // attempt update
    change_password($_SESSION['valid_user'], $old_passwd, $new_passwd);
    echo '<h2>Password changed.</h2>';
  }
  catch (Exception $e)
  {
    echo "<h3>You did not succeed in changing the password.</h3>\n";
    echo $e->getMessage();
    display_user_menu();
    do_html_footer();
  }
  display_user_menu();
  do_html_footer();
?>
```

ShowAvailableIdeas.php

```
 <?php
//FILE:  ShowAvailableIdeas.php


 //GSD:  July 22, 2007.


 require_once('functions.php');
 session_start();

  do_html_header('Display all submitted ideas');
  echo "<!-- FILE: ShowAvailableIdeas.php (not a function) -->\n";

  //insert_array_info();

  $ThisUsersGroup  = $_SESSION['AssignedToGroup'];
  $ThisUser        = $_SESSION['valid_user'];
  $nAvailableIdeas = 0;
  //echo '<p>ThisUser is '.$ThisUser."\n";
  try
  {
    check_valid_user();
    $conn = db_connect();
    $user_array = array();     //create an array to hold user names
    $ThisUser_ideas = array(); //create an array to hold his ideas
    $result = $conn->query("select username, experimental_group from
user");

    for ($count = 0; $row = $result->fetch_row(); /*incr is in the loop*/
)
    {
      $Fetched_username           = $row[0];
      $Fetched_experimental_group = $row[1];

      if( $Fetched_experimental_group     == $ThisUsersGroup ) {
        if( $ThisUser == $Fetched_username ) {
          //always OK to see ones own ideas
          $user_array[$count] = $Fetched_username;
          $count += 1; //otherwise it is as though we never saw the data
row
        }else{ //same group, but different users.
               //if the shared group is an experimental group *SG* then
               //it is still ok
              if( 0 == strcmp( substr($ThisUsersGroup, 3, 1), "G" )  ){
                //the user can see whole group
                $user_array[$count] = $Fetched_username;
                $count += 1; //otherwise it is as though we never saw the
row
              } //else {
                       //same group, different users, and users are
                       //restricted to seeing only their own ideas.
                // }
        }
      }//else{ //never allow them to see ideas from different groups !
       //}
    }//end of for loop

    foreach ($user_array as $ThisUser){
       $result = $conn->query(
               "select idea from yellow_sticky where
username='$ThisUser'");
       if($result->num_rows>0){
          $nAvailableIdeas += 1;
          //create the table and init the alternating color
          echo "<br><table width=500 cellpadding=2 cellspacing=0>\n";
          echo "<tr bgcolor='$cccccc'><td><strong><center>"
              .$ThisUser."</center></strong></td></tr>\n";
          echo "<tr bgcolor='black' height='1'><td></td></tr>\n";


          $color = "yellow";
          for ($count=0; $count<$result->num_rows; $count++){
             $all_of_row = $result->fetch_assoc();
             if ($color == "yellow"){
                 $color = "#FFFF88"; //that should be a light yellow color
             }else{
                 $color = "yellow";
             }
             // remember to call stripslashes when displaying user data
             // strip_tags was done when the data was originally entered.
             // So, tags should never be in the database !
            echo "<tr bgcolor='$color'><td>"
                 . stripslashes( $all_of_row['idea'] )
                 . "</td></tr>\n";
            echo "<tr bgcolor='black' height='1'><td></td></tr>\n";
          }
          echo "</table>\n";
       }
    }
    if(0 == $nAvailableIdeas)
            echo "<h3>Sorry, there are no ideas to display</h3>\n";
    echo "<br><br><br><br>\n";
  }
  catch (Exception $e)
  {
    make_log_entry($ThisUser, "", ShowAvailableIdeas.php,
                   'User '.$ThisUser
                          .', fails trying to display all the ideas '
                          . 'visible to the experimental condition.');
    echo $e->getMessage();
  }
   make_log_entry($ThisUser, "", ShowAvailableIdeas.php,
                  'User '.$ThisUser.', displays all the ideas '
                  . 'visible to the experimental condition.');
  display_user_menu();
  do_html_footer();

?>
```

add_Yellow_Sticky_form.php

```
<?php

//FILE: add_Yellow_Sticky_form.php


// include function files for this application
require_once('functions.php');
session_start();

// start output html
do_html_header('Add New Idea');

check_valid_user();
display_add_new_idea_form("");

display_user_menu();
do_html_footer();

?>
```

add_Yellow_Sticky_New_Idea.php

```
<?php
//FILE:  add_Yellow_Sticky_New_idea.php   THIS IS A FORM,
//so need to check user data

 //GSD:  June 12, 2007.
 //      July 26, 2007   WARNING:  for this version, I'm disabling
updating!

require_once('functions.php');
session_start();
do_html_header('Adding a new idea', "WITHOUT QUESTION");

echo '<p>this is the raw post value.' . $_POST['new_idea'] ."/n";
try{
  //echo "<p>creating short name<br>\n";
  //create short variable name
  if(isset($_POST['new_idea']) ){
     //echo "<p> isset is true\n";
     if(!get_magic_quotes_gpc()      )
     { //I’ll need to add my own quotes, else text has already been
escaped
       //add the escapes *AND* strip php and html tags
        $new_idea = strip_tags( addslashes($_POST['new_idea']) );
     }else{
       //echo "<p> magic_quotes_gpc is true\n";
       $new_idea = strip_tags($_POST['new_idea']  );
     }
  } else{
     throw new Exception('Form not completely filled out.');
  }
 update or add_new_yellow_sticky in url_fns.php -->\n";

  echo "<!-- FILE: add_Yellow_Sticky_New_Idea.php is a FORM, ";
  echo "but invokes add_new_yellow_sticky in url_fns.php -->\n";

  check_valid_user();

  // try to add the new yellow sticky idea
  add_new_yellow_sticky($new_idea);// which is in url_fns.php for some
                                   // bizarre reason
  echo '<h2>Idea added to database.</h2>';
}
catch (Exception $e){
   echo $e->getMessage();
   display_user_menu();
   do_html_footer();
   exit;
}

display_user_menu();
do_html_footer();

?>
```

ShowQuestionnaireForm.php

```
<?php
 //FILE:   ShowQuestionnaireForm.php
 //        THIS IS A FORM, but it doesn't accept any POST data itself !

 require_once('functions.php');
 DisplaySatisfactionQuestionnaire_form(); //see functions.php
 do_html_footer();
?>
```

SaveSatisfactionInput.php

```php
<?php
      //FILE: SaveSatisfactionInput.php FORM
      //    accepts POST INPUTS:
      //    Q1 through Q2 with values [1.., Sex, PositionAtSNL,
      //    YearsWorkedAtSNL

  // include function files for this application
  require_once('functions.php');


  do_html_header("Satisfaction Questionnaire -- Saving", "WITHOUT
QUESTION");

  echo "<!-- from FILE: Save_Demographic_input.php -->\n";
  //start session which may be needed later
  //start it now because it must go before headers
  session_start();
  $username = $_SESSION['valid_user'];

//check user input for mistakes or malicious input:
// __________Question 1 ________
if( $_POST['Q1'] && !ereg('^[1-7]$', trim($_POST['Q1']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q1'])."<br>\n";
    echo "\n<!-- unexpected input for question 1, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}
// __________Question 2 ________
if( $_POST['Q2'] &&  !ereg('^[1-7]$', trim($_POST['Q2']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q2'])."<br>\n";
    echo "\n<!-- unexpected input for question 2, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 3 ________
if( $_POST['Q3'] && !ereg('^[1-7]$', trim($_POST['Q3']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q3'])."<br>\n";
    echo "\n<!-- unexpected input for question 3, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 4 ________
if( $_POST['Q4'] && !ereg('^[1-7]$', trim($_POST['Q4']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q4'])."<br>\n";
    echo "\n<!-- unexpected input for question 4, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 5 ________
if( $_POST['Q5'] &&  !ereg('^[1-7]$', trim($_POST['Q5']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q5'])."<br>\n";
    echo "\n<!-- unexpected input for question 5, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 6 ________
if( $_POST['Q6'] && !ereg('^[1-7]$', trim($_POST['Q6']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q6'])."<br>\n";
    echo "\n<!-- unexpected input for question 6, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 7 ________
if( $_POST['Q7'] && !ereg('^[1-7]$', trim($_POST['Q7']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q7'])."<br>\n";
    echo "\n<!-- unexpected input for question 7, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';
    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 8 ________
if( $_POST['Q8'] &&  !ereg('^[1-7]$', trim($_POST['Q8']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q8'])."<br>\n";
    echo "\n<!-- unexpected input for question 8, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

// __________Question 9 ________
if( $_POST['Q9'] && !ereg('^[1-7]$', trim($_POST['Q9']), $matches) ){
    echo '<h2> Q1 is '.trim($_POST['Q9'])."<br>\n";
    echo "\n<!-- unexpected input for question 9, see "
         "SaveSatisfactionInput.php -->\n";

    do_html_header('Problem:', "WITHOUT RADIO BUTTON");
    echo 'Your survey responses could not be completed.';

    DisplaySatisfactionQuestionnaire();
    do_html_footer();
    exit;
}

  //create short variable names
  $user = $_SESSION['valid_user'];

  if(!$_POST['Q1']) $Q1 = 'NULL';
  else              $Q1 = "'".$_POST['Q1']."'";
  if(!$_POST['Q2']) $Q2 = 'NULL';
  else              $Q2 = "'".$_POST['Q2']."'";
  if(!$_POST['Q3']) $Q3 = 'NULL';
  else              $Q3 = "'".$_POST['Q3']."'";
  if(!$_POST['Q4']) $Q4 = 'NULL';
  else              $Q4 = "'".$_POST['Q4']."'";
  if(!$_POST['Q5']) $Q5 = 'NULL';
  else              $Q5 = "'".$_POST['Q5']."'";
  if(!$_POST['Q6']) $Q6 = 'NULL';
  else              $Q6 = "'".$_POST['Q6']."'";
  if(!$_POST['Q7']) $Q7 = 'NULL';
  else              $Q7 = "'".$_POST['Q6']."'";
  if(!$_POST['Q8']) $Q8 = 'NULL';
  else              $Q8 = "'".$_POST['Q8']."'";
  if(!$_POST['Q9']) $Q9 = 'NULL';
  else              $Q9 = "'".$_POST['Q9']."'";
  //echo "\n<!-- after filled_out check-->\n";
  //echo "<h2> after checking values</h2>\n";
  try{ // attempt to save the questionnaire
    $conn = db_connect();
    if(!conn) throw new Exception(
      '<h2> Could not connect to the database. Please, try again
later.</h2>');
    //echo "<p>got a connection.\n";
    $queryText =
         "select * from SatisfactionQuestionnaire where username='$user'";
    $existingAnswers = $conn->query($queryText);
    if($existingAnswers->num_rows == 0){
       $result=$conn->query(
               "INSERT INTO SatisfactionQuestionnaire
                            (username,
                             question_1,
                             question_2,
                             question_3,
                             question_4,
                             question_5,
                             question_6,
                             question_7,
                             question_8,
                             question_9)
                     values ('$user',
                             $Q1,
                             $Q2,
                             $Q3,
                             $Q4,
                             $Q5,
                             $Q6,
                             $Q7,
                             $Q8,
                             $Q9)" ); //NOTE how this is not a normal
query,
                                      // the php variables are already
                                      // carrying the tick marks
                                      // I needed to do it this way
                                      // so I could insert NULLs...maybe
                                      // something better, but I don't
                                      // know how, yet :)

       if(!$result) throw new Exception(
        '<h2>Could not insert the questionnaire data into the
database.</h2>');
    }else{
      // echo "<p>need to do an update, instead\n";
       $result=$conn->query(
               "UPDATE  SatisfactionQuestionnaire
                             SET question_1=$Q1,
                                 question_2=$Q2,
                                 question_3=$Q3,
                                 question_4=$Q4,
                                 question_5=$Q5,
                                 question_6=$Q6,
                                 question_7=$Q7,
                                 question_8=$Q8,
                                 question_9=$Q9  WHERE username='$user'");
                                      //NOTE how this is not a normal
query,
                                      // the php variables are already
                                      // carrying the tick marks
                                      // I needed to do it this way
                                      // so I could insert NULLs...maybe
                                      // something better, but I don't
                                      // know how, yet :)


       if(!$result) throw new Exception(
        '<h2>Could not update the questionnaire data into the
database.</h2>');    }
  }
  catch (Exception $e){
     //do_html_header('Problem:');
     echo "<h2>There was a problem questionnaire input:</H2><br>\n";
     echo $e->getMessage();
     do_html_footer();
     exit;
  }
  echo "<center><h1> Thank you for completing the
survey.</h1></center>\n";
  echo "<br><br><br>\n";
  display_user_menu();
  make_log_entry($username, SaveSatisfactionInput.php,
                 SaveSatisfactionInput.php, 'User '.$username
                .', has submitted the satisfaction questionnaire.');
  do_html_footer();

?>
```

logout.php

```
<?php

//FILE: logout.php


// include function files for this application
require_once('functions.php');
session_start();
$old_user = $_SESSION['valid_user'];

if($old_user) make_log_entry($old_user, 'not a function', logout.php,
                             'User '.$old_user.' requested logout.');
else          make_log_entry($old_user, 'not a function', logout.php,
                                        'Logout form invoked with no one'
                                       . ' logged in. '
                                       . 'Probably refresh of old form.');
// store  to test if they *were* logged in
unset($_SESSION['valid_user']);
$result_dest = session_destroy();

// start output html
do_html_header('Logging Out', 'WITHOUT QUESTION');

if (!empty($old_user))
{
  if ($result_dest)
  {
    // if they were logged in and are now logged out
    echo 'Logged out.<br />';
    do_html_url('begin.php', 'Login');
    do_html_url('register_form.php', 'Not a member, yet?  Please
register');
  }
  else
  {
   // they were logged in and could not be logged out
    echo 'Already logged out.<br />';
  }
}
else
{
  // if they weren't logged in but came to this page somehow
  echo 'You were not logged in, and so have not been logged out.<br />';
  do_html_url('begin.php', 'Login');
  do_html_url('register_form.php', 'Not a member, please register');

}

do_html_footer();

?>
```

db_fns.php

```
<?php
//FILE: db_fns.php

function db_connect()
{
  $result = new mysqli('localhost', 'ldrdWEBBOT',
                       '20thinkBIG07', 'ldrd105937');

  echo "\n<!-- in db_fns.php db_connect returned:".$result." -->\n";
  if (!$result)
     throw new Exception('Could not connect to database server');
  else
     return $result;
}

?>
```

user_auth_fns.php

```
<?php

require_once('functions.php');

function register($username, $email, $password){
  //I'm going to whack tags and things needing slashes when they enter
them
  // register new person with db
  // return true or error message
  echo "\n<!-- trying to connect, see register in user_auth_fns.php-->\n";
  // connect to db
  $conn = db_connect();

  echo "\n<!-- after db_connect function call in user_auth_fns.php -->\n";


  // check if username is unique
  $result = $conn->query("select * from user where username='$username'");
  //there can be a problem with this code if the this is the first user
  //to register and the db is empty


  echo '<!-- result is '.$result." -->\n";
  if ($result){
     if ($result->num_rows>0) {
            throw new Exception('<h2>That username is taken - please click
<a href=register_form.php> here</a> and choose another one.</h2>');
     }
  }
  // if ok, put in db
  $result = $conn->query("insert into user (username, passwd, email)
VALUES
                         ('$username', sha1('$password'), '$email')");
  if (!$result){
    make_log_entry($username, register, db_fns.php, 'Could not register,
insert into db user failed.');
    throw new Exception('<h2>Could not register you in database - <a
href=register_form.php> please try again</a>, later.');
  }
  make_log_entry($username, register, db_fns.php, 'Registration: step 1,
username '.$username.' added to db user.');
  return true;
}


//I'm going to whack tags and things needing slashes when they enter them
function add_demographic_data_to_registration( $username, $Age, $Sex,
$PositionAtSNL, $YearsWorkedAtSNL)
{

  //echo '<p>username is '.$username.'<p>age is '.$Age .'<p>sex is
'.$Sex.'<p>position at SNL is |'.$PositionAtSNL. '|<p>and years worked at
SNL is '. $YearsWorkedAtSNL . "\n";
```

```
  //echo "\n<!-- trying to connect, see
add_demographic_data_to_registration in user_auth_fns.php-->\n";
  //NOTE: the caller, Save_Demographic_Input.php, calls this function from
within a try, so these exceptions will be caught

  $IsStudent = 0;
  if( $PositionAtSNL == 'Student Intern') $IsStudent = 1;
  if( $PositionAtSNL == 'Other Student' ) $IsStudent = 1;
  //echo '<p>IsStudent = '. $IsStudent . "\n";


  // connect to db
  $conn = db_connect();

  echo "\n<!-- after db_connect see add_demographic_data_to_registration
in user_auth_fns.php -->\n";

  $result = $conn->query("SELECT * FROM user where username='$username'");
  echo '<!-- result is '.$result." -->\n";
  if ($result){
        //echo '<p>result_numRows is ' .$result->num_rows . "\n";
        if ($result->num_rows != 1) {
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                    . 'The user name
'.$username.' is not unique in the db user.');
            throw new Exception('<h2>The user name is not unique in the
database. Please contact the principle investigators.</h2>');
        }
  }
  //echo "<p>good username\n";

  // if ok, put in db, which is automatically increment
numeric_regular_employee_number   or    numeric_student_intern_number
  // I've had trouble with this page being resent multiple times, which
cause the same user to have multiple numeric values.
  // Because I have already ascertained that their is only one user with
this username, I'm going to go with the old value, if it is there.
  if( $IsStudent == 1 ){
     $result = $conn->query("select numeric_student_intern_number   from
student_interns     where username='$username'");
     if($result->num_rows == 0){ //go ahead and insert it
            $result = $conn->query("insert into student_interns
(username) VALUES  ('$username')");
     }
  }else{
     $result = $conn->query("select numeric_regular_employee_number from
regular_employees   where username='$username'");
     if($result->num_rows == 0) {//go ahead and insert it
            $result = $conn->query("insert into regular_employees
(username) VALUES  ('$username')");
     }
  }
  if (!$result){
       if($IsStudent == 1){
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                  . 'The user name could
not be inserted into student_interns db.');
       } else {
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                  . 'The user name could
not be inserted into regular_employees db.');
       }
       throw new Exception('Could not update
numeric_regular_employee_number or numeric_student_intern_number. Please
contact the principle investigators');
  }
  //echo "<p>inserted username into one or the other of the two employee
tables\n";


  // if ok, retrieve either numeric_regular_employee_number   or
numeric_student_intern_number
  if( $IsStudent == 1 ){
     $result = $conn->query("select numeric_student_intern_number   from
student_interns     where username='$username'");
  }else{
     $result = $conn->query("select numeric_regular_employee_number from
regular_employees   where username='$username'");
  }
  if (!$result){
       if($IsStudent == 1){
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                  . 'Could not retrieve
numeric_student_intern_number from student_interns db.');
       } else {
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                  . 'Could not retrieve
numeric_regular_employee_number from regular_employees db.');
       }
       throw new Exception('Could not retrieve
numeric_regular_employee_number or numeric_student_intern_number. Please,
contact the principle investigators.');
  }

  $num_results = $result->num_rows;
  //echo '<p>what is going on? num_results = ' . $num_results . "\n";
  if( $num_results != 1){
       if($IsStudent == 1){
            make_log_entry(  $username,
                             add_demographic_data_to_registration,
                             db_fns.php,
                            'Registration: step 2 FAILED. '
                          . 'Unexpectly found multiple copies of user ’
                          .$username
         .' with the same numeric identifier in student_interns db.');
       } else {
            make_log_entry(  $username,
                             add_demographic_data_to_registration,
                            db_fns.php, 'Registration: step 2 FAILED. '
        . 'Unexpectly found multiple copies of user ' . $username
        .' with the same numeric identifier in regular_employees db.');
       }
       throw new Exception("<h2>Unexpectly found multiple users with same
numeric identifier.</h2>\n");
  }
  //echo "<p>I got exactly one row back\n";
  $row = $result->fetch_object();
  //echo '<p>found ' . $row->numeric_student_intern_number . "\n";
  if( $IsStudent == 1  ){
     //echo "<p>inside Student Intern\n";
     $numeric_id = $row->numeric_student_intern_number;
     //echo '<p>numeric_id is ' . $numeric_id . "\n";
     if( 0 == ($numeric_id % 2) ){
        //echo "<p>inside first mod 2\n";
        if( 0 == ( ($numeric_id / 2) % 2) ){
              //echo "<p>inside first divide by 2\n";
              $AssignedToGroup = "SISOH"; //Student Intern, See Own ideas,
Hunter's question
        }else{
              //echo "<p> inside the else fro the first div by 2 \n";
              $AssignedToGroup = "SISOT"; //Student Intern, See Own ideas,
Thumb questions
        }
     }else{
        //echo "<p>inside the else for first mod 2\n";
        if( 0 == ( ($numeric_id / 2) % 2) ){
              $AssignedToGroup = "SISGH"; //Student Intern, See Group
ideas,   Hunter's question
        }else{
              $AssignedToGroup = "SISGT"; //Student Intern, See Group
ideas,   Thumb questions
        }
     }
     //echo '<p> this student is given to group ' . $AssignedToGroup .
"\n";

  } else { //THIS PERSON declared that he/she is a REGULAR SNL EMPLOYEE
     //echo "<p>inside regular_employees\n";
     $numeric_id = $row->numeric_regular_employee_number;
     //echo '<p>numeric_id is ' . $numeric_id . "\n";
     if( 0 == ($numeric_id % 2) ){
        $AssignedToGroup = "RESOH"; //Regular Employee, See Own ideas,
Hunter's question
     }else{
        $AssignedToGroup = "RESGH"; //Regular Employee, See Group ideas,
Hunter's question
```

```
     }
  }
  //echo '<p>user ' . $username . ' is a ' . $PositionAtSNL . ' with
numeric id= ' . $numeric_id . ' and has been assigned to group ' .
$AssignedToGroup . "\n";

  $_SESSION['AssignedToGroup'] = $AssignedToGroup;
  $result = $conn->query("UPDATE user SET employee_type='$PositionAtSNL',
experimental_group='$AssignedToGroup' WHERE username='$username'");
  if (!$result){
       if($IsStudent == 1){
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                  . 'For user
'.$username.' could not retrieve numeric_student_intern_number from
student_interns db.');
       } else {
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: step 2
FAILED. '
                                                  . 'For user
'.$username.' could not retrieve numeric_regular_employee_number from
regular_employees db.');
       }
       throw new Exception('Could not retrieve
numeric_regular_employee_number or numeric_student_intern_number. Please
contact the principle investigators');
  }
  if($IsStudent == 1){
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: Step 2
demographic data added. '
                                                  . 'The student
'.$username. ' assigned to group '.$AssignedToGroup);
  } else {
            make_log_entry(  $username,
add_demographic_data_to_registration,
                                        db_fns.php, 'Registration: Step 2
demographic data added. '
                                                  . 'Regular employee
'.$username. ' assigned to group '.$AssignedToGroup);
  }
  return true;
  //exit;
}



function login($username, $password){//I'm going to whack tags and things
needing slashes when they enter them
  echo "<!-- function login; see, user_auth_fns.php-->\n";
  // check username and password with db
  // if yes, return true
  // else throw exception

  // connect to db
  $conn = db_connect();

  // check if username is associated with a experimental group (which
means they have finished the second part of registration)
  $result = $conn->query("select experimental_group from user
                         where username='$username'
                         and passwd = sha1('$password')");
   //echo "<p>trying to select experimental group from user\n";

  if (!$result){
     //echo "<p>without success\n";
     make_log_entry($username, login, db_fns.php, 'Incorrect, attempt to
login for '.$username.', initial query to db failed.');
     throw new Exception('Could not log you in.');
  }
  if ($result->num_rows==1){
     //echo "<p>one row\n";
     $row = $result->fetch_object();
     $_SESSION['username'] = $username;
     $_SESSION['AssignedToGroup'] = $row->experimental_group;
     make_log_entry($username, login, db_fns.php, 'User '.$username.', in
group '.$row->experimental_group. ' logged in.');
     return true;
  }
  else {
     //echo "<p>else could not log you in\n";
     make_log_entry($username, login, db_fns.php, 'Could not login user
'.$username.', name not in, or not uniquely found in db.');
     throw new Exception("Could not log you in."); //NOTE: member.php
catches the exception BUT DOES NOT PRINT IT!
  }
}

function check_valid_user(){ //I'm going to whack tags and things needing
slashes when they enter them
  // see if somebody is logged in and notify them if not
  if (isset($_SESSION['valid_user']))
  {
      //echo 'You are currently logged in as
'.$_SESSION['valid_user'].'.';
      //echo '<br />';
  }
  else
  {
     // they are not logged in
     do_html_heading('Problem:');
     echo 'You are not logged in.<br />';
     do_html_url('begin.php', 'Login');
     do_html_footer();
     exit;
  }
}
```

```
function change_password($username, $old_password, $new_password) { //I'm
going to whack tags and things needing slashes when they enter them
  // change password for username/old_password to new_password
  // return true or false
  // if the old password is right
  // change their password to new_password and return true
  // else throw an exception
  if(0 == strcmp($old_password, $new_password) ){
    make_log_entry(  $username, change_password, db_fns.php, 'Could not
change password to be same as it already is for user '.$username);
    throw new Exception('<b>old and new passwords are the same!</b>');
  }
  //echo '<h2> username is '. $username ."</h2><br>\n";
  //echo '<h2> caller supplies password '.sha1($old_password).
"</h2><br>\n";

  $conn = db_connect();
  //if($conn) echo "<h2> connected</h2><br>\n";
  $result = $conn->query( "select passwd from user where username =
'$username'");
  //if($result) echo "result not null\n";
  $row = $result->fetch_object();
  //if($row) echo "row not null\n";
  //echo '<h2> stored password  is '.$row->passwd."</h2><br>\n";
  if( sha1($old_password) != $row->passwd ){
     //echo "<h2> old password does not match</h2><br>\n";
     make_log_entry( $username, change_password, db_fns.php, 'user
'.$username.' attempted to change password without the correct original
password');
     throw new Exception("<b>Warning!  attempting to change password
without the correct original password</b>");
  }

  //otherwise, allow the change
  //echo "<h2> allow update</h2><br>\n";
  $result = $conn->query( "update user
                            set passwd = sha1('$new_password')
                            where username = '$username'");
  if (!$result){
    make_log_entry(  $username, change_password, db_fns.php, 'Could not
change password for user '.$username);
    throw new Exception('<b>Password could not be changed.</b>');
  }  else {
    make_log_entry(  $username, login, db_fns.php, 'User '.$username. '
successfully changed password.');
    return true;  // changed successfully
  }
}


?>
```

url_fns.php

```
<?php
//FILE: url_fns.php


require_once('functions.php');


function get_user_ideas($username)
{
  //extract from the database all the ideas this user has stored
  $conn = db_connect();
  $result = $conn->query( "select idea
                        from yellow_sticky
                        where username = '$username'");
  if (!$result) return false;

  //create an array of the URLs
  $url_array = array();
  for ($count = 1; $row = $result->fetch_row(); ++$count)
  {
    $url_array[$count] = strip_tags( stripslashes( $row[0] ));
  }
  return $url_array;
}


//gsd: 6/12/07 need to add the idea to the database
function add_new_yellow_sticky($new_idea){
  // Add new yellow sticky to the database


  $valid_user = $_SESSION['valid_user'];

  // this was done in add_Yellow_Sticky_New_Idea.php
if(!get_magic_quotes_gpc()) $new_idea = addslashes( strip_tags( $new_idea
) );

  echo "Attempting to add: <br /><br /><font style='background:#ffff00'>".
$new_idea  .'</font><br /><br />';

  $conn = db_connect();


  // insert the new idea
  if (!$conn->query( "insert into yellow_sticky
                        set username='$valid_user',
                            idea='$new_idea'" )){
      make_log_entry($valid_user, add_new_yellow_sticky, url_fns.php,
'User '.$valid_user.', failed trying to add a new idea to db
yellow_sticky.');
      throw new Exception('Yellow_sticky idea could not be inserted.');
  }
  make_log_entry($valid_user, add_new_yellow_sticky, url_fns.php, 'User
'.$valid_user.', added a new idea to db yellow_sticky.');
```

```
  return true;

}



function get_user_urls($username)
{
  //extract from the database all the URLs this user has stored
  $conn = db_connect();
  $result = $conn->query( "select bm_URL
                          from bookmark
                          where username = '$username'");
  if (!$result) return false;

  //create an array of the URLs
  $url_array = array();
  for ($count = 1; $row = $result->fetch_row(); ++$count)
  {
    $url_array[$count] = strip_tags( stripslashes( $row[0] ) );
  }
  return $url_array;
}

?>
```

functions.php

```
<?php
//debugging: i have been trying to log in as bob2 ... fails.   I added the
four require_once lines and am trying to chase that part down.
//FILE: functions.php


  require_once('dump_array.php');

  //require_once('data_valid_fns.php'); gsd: don't need this one.
                             //it only had check email address and
dump_array()

  require_once('db_fns.php');
  require_once('user_auth_fns.php');
  //require_once('output_fns.php');  gsd: i moved all of these
                                    //functions into this file !
  require_once('url_fns.php');

function filled_out($form_vars){
  //echo "<!-- dumping form variables ".dump_array($form_vars)." -->\n";

  foreach ($form_vars as $key => $value){
    //echo '<!-- '.$key." has value ".htmlspecialchars($value)." -->\n";
    if( !isset($key) || ($value == '')){
      echo '<!-- the form variable '.$key." is not set, or is empty! --
>\n";
      return false;
    }
  }
  return true;
}



function make_log_entry($user, $caller, $seeFile, $logComment){
//WARNING: I'm not going to add/strip slashes here
//        when you call it, make sure your input
//         doesn't include quotes or things needing escapes
//__________________________________________________________

 if(strlen($logComment)>100) $logComment = substr($logComment, 0,99);
 //echo '<p>logComment:' . $logComment . "\n";
 try{
     // connect to db
     $conn   = db_connect();
     if(!$conn) throw new Exception("Could not get connection");
     $queryIs = "INSERT INTO logfile
                                ( username,   calling_function,
                                  function_in_file,   comment)
                         VALUES ('$user',   '$caller',
                                 '$seeFile','$logComment')" ;
     //echo '<p>queryIs: '.$queryIs."\n";
     $result = $conn->query($queryIs);
     if(!$result) throw new Exception("Could not insert the log entry.");
  }
  catch (Exception $e){
    echo "<h2>Problem making a log entry</h2>\n";
    echo $e->getMessage();
    echo "<p>incoming parameters<br>\n";
    echo "<ul>\n";
    echo '  <li> username is: '          . $user       . "\n";
    echo '  <li> called from function: ' . $caller     . "\n";
    echo '  <li> which is in file: '     . $seeFile    . "\n";
    echo '  <li> comment is: '           . $logComment . "\n";
    echo "</ul><br><br>\n";
    do_html_footer();
    exit;
  }
}

function display_site_info()
{
  // display some marketing info
?>
  <!-- from FILE: functions.php -->
  <h3> Welcome to our brain storming experiment</hr><br>
<?php
}




function display_user_menu()
{
  // display the menu options on this page

  $AssignedToGroup = $_SESSION['AssignedToGroup'];
  //echo '<p>Assigned To Group ' . $AssignedToGroup ."\n";

?>
  <!-- display_user_menu() from FILE: functions.php -->

<hr />
<!--<a href="member.php">Home</a> &nbsp;|&nbsp; -->
<B>
<a href="logout.php"><font color="RED">Logout</font></a>&nbsp;|&nbsp;
<a href="change_passwd_form.php"><font color="RED">Change
password</font></a> <br><br>

<?php
/******** this experiment only lets the user see subsets of the ideas, so
these pages are commented out
<a href="ShowMyIdeas.php">Display my ideas</a>
<a href="ShowIdeas_RegardlessOfSource.php">&nbsp;|&nbsp;Display all
submitted ideas</a><br><br>
*********/
?>

<a href="add_Yellow_Sticky_form.php"><font color="RED">Add new
idea</font></a>        &nbsp;|&nbsp;
```

```
<a href="ShowAvailableIdeas.php"><font color="RED">Display submitted
ideas</font></a> &nbsp;|&nbsp;
<a href="ShowWebsiteInstructions.php"><font color="RED">Display website
instructions</font></a><br><br>

<a href="ShowQuestionnaireForm.php"><font color="RED">Fill out the
satisfaction questionnaire</font></a><br><br>
</B>

<?php
  /************
  // only offer the delete option if bookmark table is on this page
  global $yellow_sticky_table;

  if($yellow_sticky_table==true)
    echo "<a href='#' onClick='yellow_sticky_table.submit();'>Delete
submitted idea(s)</a>";
  else
    echo "<font color='#cccccc'>Delete submitted idea(s)";
  *************/


?>
<br /><hr />
<?php
}






function do_html_header($title, $NoQuestion)
{
  // print an HTML header
?>
  <html>
  <!-- from FILE: functions.php -->
  <head>
    <title><?php echo $title;?></title>
    <style>
      body { font-family: Arial, Helvetica, sans-serif; font-size: 13px }
      li, td { font-family: Arial, Helvetica, sans-serif; font-size: 13px
}
      hr { color: #3333cc; width=300; text-align=left}
      a { color: #000000 }
    </style>
  </head>
  <body>
  <img src="BrainStormIcon.gif" alt="Online BrainStorm logo" border=0
       align=left valign=bottom height = 100 width = 70 />
  <br/><h1>&nbsp;Online BrainStorm</h1><br/>
  <hr />
<?php
  if($title)        do_html_heading($title);
  if(!$NoQuestion)  do_display_Question();
}
```

```
function do_display_Question(){
  //I pull this question from the database.

  $AssignedToGroup = $_SESSION['AssignedToGroup'];
  $WhichQuestionGroup = substr($AssignedToGroup, 4,1);
  try{
     // connect to db
     $conn = db_connect();
     if(0==strcmp( $WhichQuestionGroup, "H") ){
            $result = $conn->query("select question_text from question
where question_identifier='Hunter'");
     }else{
        if(0==strcmp( $WhichQuestionGroup, "T") ){
            $result = $conn->query("select question_text from question
where question_identifier='Thumbs'");
        } else {
                throw new Exception('<p>Group '.$AssignedToGroup
                    ." has no assigned question; contact one of the
PIs\n");
        }
     }

     $row = $result->fetch_object();

     //ALWAYS strip slashes...even if magic_quotes are NOT enables,
     //I will be adding them with addslashes(), so they need to be pulled
out!
     $The_Focus_Question = stripslashes( $row->question_text );
     //NOTE: I leave HTML & PHP tags in the question because I write them
     //      however, all using input will have html and PHP tags stripped
out!
     //$The_Focus_Question = strip_tags( $The_Focus_Question );
  }
  catch (Exception $e){
    echo $e->getMessage();
    do_html_footer();
    exit;
  }
  echo "<p><h2>Session question or problem is:</h2>\n";
  echo '<p>'.$The_Focus_Question."<br><br><hr>\n";
}



function do_html_footer()
{
  // print an HTML footer
?>
  <!-- from FILE: functions.php -->
  </body>
  </html>
<?php
}
```

```
function do_html_heading($heading)
{
  // print heading
?>
  <!-- from FILE: functions.php -->
  <h2><?php echo $heading;?></h2>
<?php
}

function do_html_URL($url, $name)
{
  // output URL as link and br
?>
  <!-- from FILE: functions.php -->
  <br /><a href="<?php echo $url;?>"><?php echo $name;?></a><br />
<?php
}



function display_login_form()
{
?>
  <!-- from FILE: functions.php -->

  <a href='register_form.php'>Not a member?</a>
  <form method='post' action='member.php'>
  <table bgcolor='#cccccc'>
   <tr>
     <td colspan=2>Members log in here:</td>
   <tr>
     <td>Username:</td>
     <td><input type='text' name='username' size=16
maxlength=16></td></tr>
   <tr>
     <td>Password:</td>
     <td><input type='password' name='passwd' size=40
maxlength=40></td></tr>
   <tr>
     <td colspan=2 align='center'>
     <input type='submit' value='Log in'></td></tr>
 </table></form>
 <br>
    <B>Forgot your password?</B> Unfortunately, privacy rules do not allow
us to record any information that would allow us to identify you.
                          So, we have no way of contacting you to give you
a hint about your password; so, <b>Please write when you register.</b>
 <br>
<?php
}

function display_registration_form()
{
      include_consent_message(); //gsd 6/8/07, see just below this
              // display_registration_form for the consent function
?>
```

```
  <!-- from FILE: functions.php   see functions.php
display_registration_form()-->

 <form method='post' action='register_new.php'>
 <table bgcolor='#cccccc'>
   <tr>
     <td>Preferred username <br />(max 16 chars):<br /><b>Note protect
your identity! Don't use your real name, or userid.</b></td>
     <td valign='top'><input type='text' name='username'
                     size=16 maxlength=16></td></tr>
   <tr>
     <td>Password <br />(between 6 and 40 chars):</td>
     <td valign='top'><input type='password' name='passwd'
                     size=40 maxlength=40></td></tr>
   <tr>
     <td>Confirm password:</td>
     <td><input type='password' name='passwd2' size=40
maxlength=40></td></tr>
   <tr>
     <td colspan=2 align='center'>
     <input type='submit' value='I consent, please register me'></td></tr>
 </table></form>
 <br>
    <B>Warning!</B> Unfortunately, privacy rules do not allow us to record
any information that would allow us to identify you.
                         So, we have no way of contacting you to give you
a hint about your password; so, <b>Please write when you register.</b>
 <br>

<?php

}

function display_demographic_form($msg)
{
    //do_html_header($msg);
    // provide link to members page
    echo "\n<!-- after do_html_header Registration successful
display_demographic_form in functions.php -->\n";

    echo "<H2><U>Please fill out the following information and then click
the \"Continue\" button at the bottom of the screen</U></H2>\n";

?>
  <!-- from FILE: functions.php -->

  <form method="post" action="Save_Demographic_Input.php">
     <p>  Age:<input type="text"        NAME="Age" size=2 maxlength=2>

     <p>  Sex:<input type="radio"       NAME="Sex" value="M" CHECKED> M
               <input type="radio"       NAME="Sex" value="F"        > F
     <p>  Position at SNL: <SELECT      NAME="PositionAtSNL"    >
                             <option> Student Intern
                             <option> Other Student
                             <option> MTS
                             <option> SMTS
                             <option> PMTS
```

```
                              <option> DMTS
                              <option> MLS
                              <option> SMLS
                              <option> PMLS
                              <option> DMLS
                              <option> Sr Sci
                              <option> Sr Eng
                              <option> Sr Adm
                              <option> TNG
                              <option> STNG
                              <option> PTNG
                              <option> DTNG
                              <option> TSUP-tech
                              <option> TSUP-Ops
                              <option> Manager
                              <option> Sr Manager
                              <option> ASA
                              <option> SASA
                              <option> PASA
                              <option> DASA
                              <option> OMA
                              <option> Sr OMA
                              <option> Other Regular
                           </SELECT>

     <p>  Years worked at SNL: <input type="text" NAME="YearsWorkedAtSNL"
size=2 maxlength=2>

     <p>            <INPUT type="SUBMIT" NAME="SUBMIT_BUTTON"
VALUE="Continue">
   </FORM>
  <br>
<?php
   do_html_footer();

}


function display_password_form()
{
  // display html change password form
?>
   <br />
  <!-- from FILE: functions.php -->

   <form action='change_passwd.php' method='post'>
   <table width=250 cellpadding=2 cellspacing=0 bgcolor='#cccccc'>
   <tr><td>Old password:</td>
       <td><input type='password' name='old_passwd' size=40
maxlength=40></td>
   </tr>
   <tr><td>New password:</td>
       <td><input type='password' name='new_passwd' size=40
maxlength=40></td>
   </tr>
   <tr><td>Repeat new password:</td>
```

```
       <td><input type='password' name='new_passwd2' size=40
maxlength=40></td>
   </tr>
   <tr><td colspan=2 align='center'><input type='submit' value='Change
password'>
   </td></tr>
   </table>
   <br />
<?php
};

//gsd: 6/9/2007
function display_add_new_idea_form($possibly_old_idea)
{
  // display the form for people to enter a new 'yellow sticky' idea
  //echo '<p>in display_add_new_idea_form, OLD KEY:'.$possibly_old_idea;
?>
  <!-- from FILE: functions.php display_add_new_idea_form invokes
add_Yellow_Sticky_New_idea.php -->

<h3>HTML tags are not supported, and will be stripped out.</h3><br>

<form name='yellow_sticky_table' action='add_Yellow_Sticky_New_Idea.php'
method='post'>
<?php echo '<INPUT TYPE="hidden" NAME="update_key"
VALUE="'.$possibly_old_idea.'">'; ?>
<table width=250 cellpadding=2 cellspacing=0 bgcolor='#cccccc' >
<tr><td>New Idea:</td><td><textarea cols="80" rows="10" name='new_idea'
style='background:#ffff00'
                                    wrap="virtual"
                                    align="LEFT"
                                    maxlength=2048
                                <?php if($possibly_old_idea != "") echo
'>'.htmlspecialchars($possibly_old_idea);
                                      else                           echo
">";
                                ?>
                          </textarea>
                       </td> </tr>
<tr><td colspan=2 align='CENTER'><input type='submit' value='Submit
Idea'></td></tr>
</table>
</form>
<?php
}




//gsd: 6/8/07.  This information is required by the human studies board
//              before allowing participation
function include_consent_message(){
?>
<html>
<body>
```

```
  <!-- from FILE: functions.php function include_consent_message -->

<p><b>Prospective research subject – Read this consent form carefully.</b>
It describes the purpose of  the research, specifies exactly what you will
do in the study & what information will be collected,  explains the risks
& benefits of your participation, and identifies what steps will be taken
to protect  your health, your privacy, and the confidentiality of the data
gathered.  You may contact the PI,  George Davidson, to as many questions
as you like.  Also, consult with family or friends before you  decide
whether you want to participate in this research study.  You may print a
copy of this form for  your records.

<h1>RESEARCH SUBJECT CONSENT FORM</h1>

<p><b>Title:</b> Assessing the Effectiveness of Electronic Brainstorming
(EBS) in an industrial setting  (SNL0727)

<p><b>Sponsor:</b> SNL LDRD entitled "Improving Human Effectiveness for
Extreme Scale Problem Solving"

<p><b>Principal Investigator:</b> George S. Davidson, Org 1400, MS 1316,
844-7902

<p><b>Other Investigators:</b> Courtney Dornburg, Org 12335; J. Chris
Forsythe, Org 6341; Susan M. Stevens, Org 12335

<p><b>Organization/Location:</b>      Sandia National Laboratories, MS
1316
                    Albuquerque, NM 87185-1316


<h2>1.      PURPOSE OF RESEARCH STUDY:</h2>

<p>You are being invited to participate in a research study designed to
assess the effectiveness of  electronic brainstorming (EBS).  You will be
asked to brainstorm ideas either alone or with other  participants via a
computer (termed electronic brainstorming) about issues pertinent to SNL.
Previous  research has investigated electronic brainstorming in laboratory
settings with college students but not  in an industrial setting.  Our
participants will include Sandia National Laboratories employees.  We
expect to recruit between 80 and 160 participants for our study.
Participants will be divided into two groups (student interns and all
other employees).  Each group will then be divided into two groups (EBS or
nominal).  Student interns will be asked to brainstorm either about an
important issue pertinent to SNL as proposed by Tom Hunter or an issue
previously studied in the literature.  All other employees will be asked
to brainstorm about the question posed by Tom Hunter.  Participants in the
EBS groups
will logon to a website and exchange ideas with other participants via the
computer over the course of four days.  Participants in the nominal groups
will brainstorm ideas individually over a course of four days and then
their ideas will be pooled.  Participants will be asked to fill out a
demographic questionnaire and a questionnaire assessing their satisfaction
with the experimental task
```

<p>You are free to choose whether or not to participate in this study and there is no penalty or loss of benefits or any adverse impact on your employment if you decide not to participate.

<h2>2. PROCEDURE:</h2>

<p>You will be asked to either brainstorm alone or brainstorm with others via a computer. If you are asked to brainstorm alone, you will brainstorm ideas by yourself at your convenience over the course of 4 days. If you are asked to brainstorm with others via the computer, you will logon to a website and brainstorm and exchange ideas with others over the course of 4 days. We ask that you to contribute at least once a day for the four days but you are strongly encouraged to contribute as much as you can over the four day period. At the end of this consent form, you will be asked to create a username and password for use to logon to the brainstorming website during the experiment. Only you will know your username; neither the other participants nor the experimenters will have access to it. After you (electronically) sign this informed consent, you will be asked to fill out a demographic questionnaire. Finally, you will be directed to a website in which you will be able to logon and contribute your ideas to the brainstorming topic. If you are in the electronic brainstorming condition, you will also be able to see other participants' ideas. You will be asked to conduct yourself in a professional manner. Anyone found to be engaging in abusive language and/or behavior will be locked out of the experiment. Be forewarned that the website will be constantly monitored by the experimenters for inappropriate language and/or behavior. The study will take place at Sandia National Laboratories from June-September 2007. Consent procedures will be conducted by one or several of the investigators.

<h2>3. POSSIBLE RISKS/DISCOMFORTS:</h2>

<p>There are minimal risks for participating in this experiment. Potential risks include possible breach of subject privacy and data confidentiality by participating in brainstorming. However, several steps are being taken to mitigate this risk. Any new information developed during the study that may affect your willingness to continue participation will be communicated to you.

<h2>4. POSSIBLE BENEFITS AND COMPENSATION:</h2>

<p>Potential benefits include a greater understanding of brainstorming and experimental design. Sandia National Laboratories will benefit by your participation since new ideas/possible solutions to difficult issues pertinent to the laboratories will be generated. The potential benefits to society include a greater understanding of the characteristics of electronic brainstrorming. There is no financial compensation for your participation in this research project.

<h2>5. CONFIDENTIALITY:</h2>

<p>Your identity in this study will be treated as confidential. Other participants/Sandians will not know that you are involved in this study and you will not know who else is participating. Only you will know your username (even the experimenters will not have this information). Once you logon to the website, you will be randomly assigned a subject number. Only this number (and no other identifying information) will be displayed

with your responses. Only the experimenters will have access to your responses. All data will be maintained on Sandia's server with standard Sandia access protection required by federal law. After that time has elapsed, if it is determined there is no longer a need for retention in the current study, data will be stored or destroyed using standard Sandia protocol for the storage or destruction of sensitive materials. The results of the study, including laboratory or any other data, may be published for scientific purposes but will not give your name or any identifiable references to you.

<p>However, any records or data obtained as a result of your participation in this study may be inspected by the sponsor, by any relevant government agency (e.g., U.S. Department of Energy), by the Sandia Human Subjects Board or by the persons conducting this study, provided that such inspectors are legally obligated to protect any identifiable information from public disclosure, except as otherwise authorized or required by law.

<p>All data will be maintained on computers with standard Sandia access protection and/or stored in a locked filing cabinet in a secure building at SNL for the retention period required by federal law. After that time has elapsed, if it is determined there is no longer a need for retention in the current study, data will be stored or destroyed using standard Sandia protocol for the storage or destruction of sensitive materials.

<p>Note: Federal law requires all records related to human subject research be retained for 3 years after study completion. All SNL records related to human subject research are currently being retained for 75 years after completion of the study in compliance with a moratorium on destruction of such records (see SNL Record Retention and Disposition Schedule, CPR400.2.13.14, Appendix A (Record Series #HR-102-212-000)). Once the moratorium is lifted, record retention will revert to the 3-year standard.

<h2>6. TERMINATION OF STUDY:</h2>

<p>You are free to withdraw from the study at any time without penalty or loss of benefits. If you choose to withdraw, please notify the Principal Investigator immediately.

<h2>7. AVAILABLE SOURCES OF INFORMATION:</h2>

<p>Any questions you may have about this study will be answered by the Principal Investigator, George Davidson at 844-7902 or Susan Stevens (Investigator) at 844-0704 or smsteve@sandia.gov.

<p>Any concerns, questions or complaints about your participation in this study will be addressed by the Administrator of the Sandia Human Studies Board, Terry Reser, at 845-9171.

<p>In case of a research-related emergency, you should call the Sandia Emergency number 911 (844-0911 on cellular phone) if on Kirtland Air Force Base or, from home during evenings and weekends, call 844-4657 and ask the Sandia Dispatcher to notify the Sandia doctor who is on call.

<h2>8. AUTHORIZATION:</h2>

```
<p>By registering and clicking on “<b>I consent, please register me</b>”
you are signifying the following:
<ul>
<li>You have read this consent form and had your questions about this
study answered to your  satisfaction.</li>
<li>You voluntarily choose to participate in this study</li>
<li>Your consent does not take away any legal rights in the case of
negligence or other legal fault of  anyone who is involved in this
study</li>
<li>Nothing in this consent form in intended to preempt any applicable
federal, state or local laws  regarding informed consent</li>
<li>You may print a copy of this form</li>
</ul>

  <!-- from FILE: functions.php   see functions.php
display_registration_form()-->
<?php
}



//gsd: 7/23/07.  This information is required by the human studies board
//               before allowing participation
function include_instructions_for_website_message(){
?>
<html>
<body>

  <!-- from FILE: functions.php function include_consent_message -->

<h2><u><center>Instructions for website</center></u></h2>

<p>Thank you for participating in our experiment.  Please read the
following instructions before continuing on.

<p>Below you will find the brainstorming topic.  Please think of possible
solutions to the question and contribute your answers over the next four
days.
You are encouraged to contribute ideas at any time but we ask that you
contribute at least once a day for the duration of the experiment.
You will be able to see other participants’ responses and add to them.

<p>Because this is a group brainstorming activity, there are specific
rules we would like you to follow:
<ul>
        <li>      the more ideas the better
        <li>      strive to combine and improve on others’ ideas
  <li>      the wilder the idea the better
  <li>      be as clear and concise as possible
  <li>      do not criticize
  <li>      NO NAME CALLING OR ABUSIVE LANGUAGE
</ul><br>

<p>We ask that you act in a professional and proper manner.  There may be
ideas that you do not agree with or feel uncomfortable with,
but please do not engage in any sort of inappropriate behavior.  Be
advised that the website will be monitored constantly throughout the
experiment.
ANYONE ENGAGING IN NAME CALLING OR ABUSIVE LANGUAGE WILL BE LOCKED OUT
FROM THE EXPERIMENT.
Please respect your fellow colleagues.

<p>Be aware that employees of all different security levels will be
participating in this experiment.
It is CRUCIAL that you do NOT include any classified or sensitive
information.

<p>Also, keep in mind that you are using a DOE computer, website and
server.  All DOE computer rules and regulations apply to this experiment.

<p>Feel free to contact George Davidson (Principal Investigator; 844.7902;
gsdavid@sandia.gov), or Courtney Dornburg (Investigator; 284.1432;
ccdornb@sandia.gov) or
Susan Stevens (Investigator; 844.0704; smsteve@sandia.gov) with questions
at any time.


<?php
     make_log_entry($username, include_instructions_for_website_message,
functions.php, 'User '.$username.', requested the display of the website
instructions.');

}





function AskQuestion($selections, $number, $questionText, $leftSide,
$rightSide){
   echo "<p>$number. $questionText\n";
   echo "<p>$leftSide\n";
   //echo "<p>--------radio buttons go here -----\n";
   for($i=0; $i<7; $i++){
    $ip1 = $i+1;
    if(!$selections[$number-1] || $ip1<>$selections[$number-1])
       echo "&nbsp; $ip1<INPUT TYPE=\"RADIO\" NAME=\"Q$number\"
value=\"$ip1\">\n";
    else
       echo "&nbsp; $ip1<INPUT TYPE=\"RADIO\" NAME=\"Q$number\"
value=\"$ip1\" CHECKED>\n";
   }


   echo "$rightSide<hr>\n";
}


function DisplaySatisfactionQuestionnaire_form()
{
  //start session which may be needed later
  //start it now because it must go before headers
  session_start();

  do_html_header("Satisfaction Questionnaire (taken from Dennis &
Valacich, 1993", "WITHOUT QUESTION");
  // provide link to members page
  echo "\n<!-- DisplaySatisfactionQuestionnaire in functions.php -->\n";

  //insert_array_info();

  $user = $_SESSION['valid_user'];



  try{ // attempt to save the questionnaire
    $conn = db_connect();
    if(!conn) throw new Exception('<h2> Could not connect to the database.
Please, try again later.</h2>');
    //echo "<p>got a connection.\n";

    $queryText = "select question_1, question_2, question_3, question_4,
question_5, " .
                       " question_6, question_7, question_8, question_9 ".
                 "from SatisfactionQuestionnaire where username='$user'";
    //echo "<p>queryTexts is $queryText \n";

   $result = $conn->query($queryText);
   if(!$result) echo "<p>no result\n";
   //echo '<p>back from query num_rows is '.$result->num_rows ."\n";
   $row = mysqli_fetch_row($result);
   //for($i=0; $i<9; $i++){
    //if(!$row[$i]) echo "<p>row[$i] is NULL\n";
    //else         echo "<p>row[$i] is $row[$i] \n"; //dump_array($row);
   //}
  }
  catch (Exception $e){
     //do_html_header('Problem:');
     echo "<h2>There was a problem questionnaire input:</H2><br>\n";
     echo $e->getMessage();
     do_html_footer();
     exit;
  }




    echo "<H4><U>Please answer the following questions regarding your
experience with the brainstroming experiment:</U></H4>\n";
    echo "<!-- from FILE: functions.php -->\n";
    echo "<FORM   METHOD=POST   ACTION=\"SaveSatisfactionInput.php\">\n";


    AskQuestion($row, 1, "How did you feel about the process by which you
generated ideas?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;very dissatisfied",
                   "very satisfied");

    AskQuestion($row, 2, "How did you feel about the idea(s) proposed?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;very dissatisfied",
                   "very satisfied");

    AskQuestion($row, 3, "All in all, how did you feel?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;very dissatisfied",
                   "very satisfied");

    AskQuestion($row, 4, "How satisfied are you with your <em>own
performance</em> on this task?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;very dissatisfied",
                   "very satisfied");

    AskQuestion($row, 5, "How stimulating did you find this task?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;not very stimulating",
                   "very stimulating");

    AskQuestion($row, 6, "How interesting was this idea generation task?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;not very interesting",
                   "very interesting");

    AskQuestion($row, 7, "How motivated were you to generate quality
ideas?",
                   "&nbsp;&nbsp;&nbsp;&nbsp;not very motivated",
                   "very motivated");


    AskQuestion($row, 8, "For this idea generation session, did you:",
                         "&nbsp; want more time",
                        "&nbsp;&nbsp;&nbsp;&nbsp;have as much time as you
needed");


    AskQuestion($row, 9, "Considering all the ideas you thought of, did
you:",
                         "&nbsp; not have time to express all ideas",
                         "&nbsp;&nbsp;&nbsp;&nbsp;have time to express all
your ideas");

    echo "<p><INPUT type=\"SUBMIT\" NAME=\"SUBMIT_BUTTON\"
VALUE=\"Submit\">\n";
    echo "   <INPUT type=\"RESET\"  NAME=\"RESET_BUTTON\"
VALUE=\"OOPS!\"><hr>\n";
    echo "</FORM>\n";
    make_log_entry( $user, DisplaySatisfactionQuestionnaire_form,
functions.php, 'User ' . $user . ' brings up the questionnaire form.');
    do_html_footer();
}






//DON'T FORGET THAT THE FILE NEEDS TO END WITH THE "leaving php tag" on
the next line:
?>
```

Distribution:

1	MS-0830	Courtney C. Dornburg, 12335
1	MS-0830	Susan Marie Stevens, 12335
1	MS-1188	James C. Forysthe, 6341
2	MS-9018	Central Technical Files, 8944 (1 electronic and 1 hardcopy)
2	MS-0899	Technical Library, 9536 (1 electronic and 1 hardcopy)
1	MS-1316	George S. Davidson, 1412