Requirements Specification

Subconscious Analysis Software (SAS)

Requested by:

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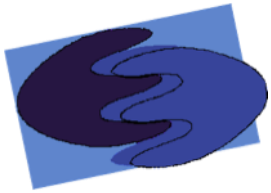
Delivered by:



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1.1 Product overview and summary

Implicit Association Tests (IATs) can be used to find a greater understanding of a person's mind. Subconscious Analysis Software (SAS) will allow an administrator to create their own IATs and allow participants to take these IATs through a web-based program. The administrator will be able to create IATs online, which includes a survey and the test itself. They will also be able view data gained by those taking the IATs and exporting the data into different formats. The participants will be able to visit the site, using a URL given to them by an administrator where they will be able to fill in the survey and take a test.

1.2 Development, Operation, and Maintenance Environments

SAS will be developed using both a Dell OptiPlex 760 running Windows Vista Enterprise and an iMac 5.1 running Mac OS X 10.6.4. enigma elucidation will be using PHP, HTML, and CSS to develop SAS, a web-based program, and a team website. We will be following the constraints set by our client, Dr. Eric Breimer and using what we have learned in our computer science classes to develop and implement our project.

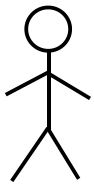
SAS will function on all major web browsers including; Internet Explorer, Safari, Mozilla Firefox and Google Chrome.

1.3 UML Use Case Diagram

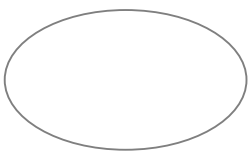
Subconscious Analysis Software's UML Use Case Diagram shows all the different users of the system, including both human and non-human. These are called actors. The diagram also shows the functions each user can perform called uses. Each user of SAS is connected to different functions in the diagram by lines. Below is the legend of the SAS UML diagram, followed by the actual diagram.

1.3.1 UML Use Case Legend

The legend explains all objects used SAS' UML Diagram and what they represent.



Actors – Users that interact with the system. Human users are on the left, and non-human users are on the left.



Uses- The interactive activities that occur between the Actors and the SAS.

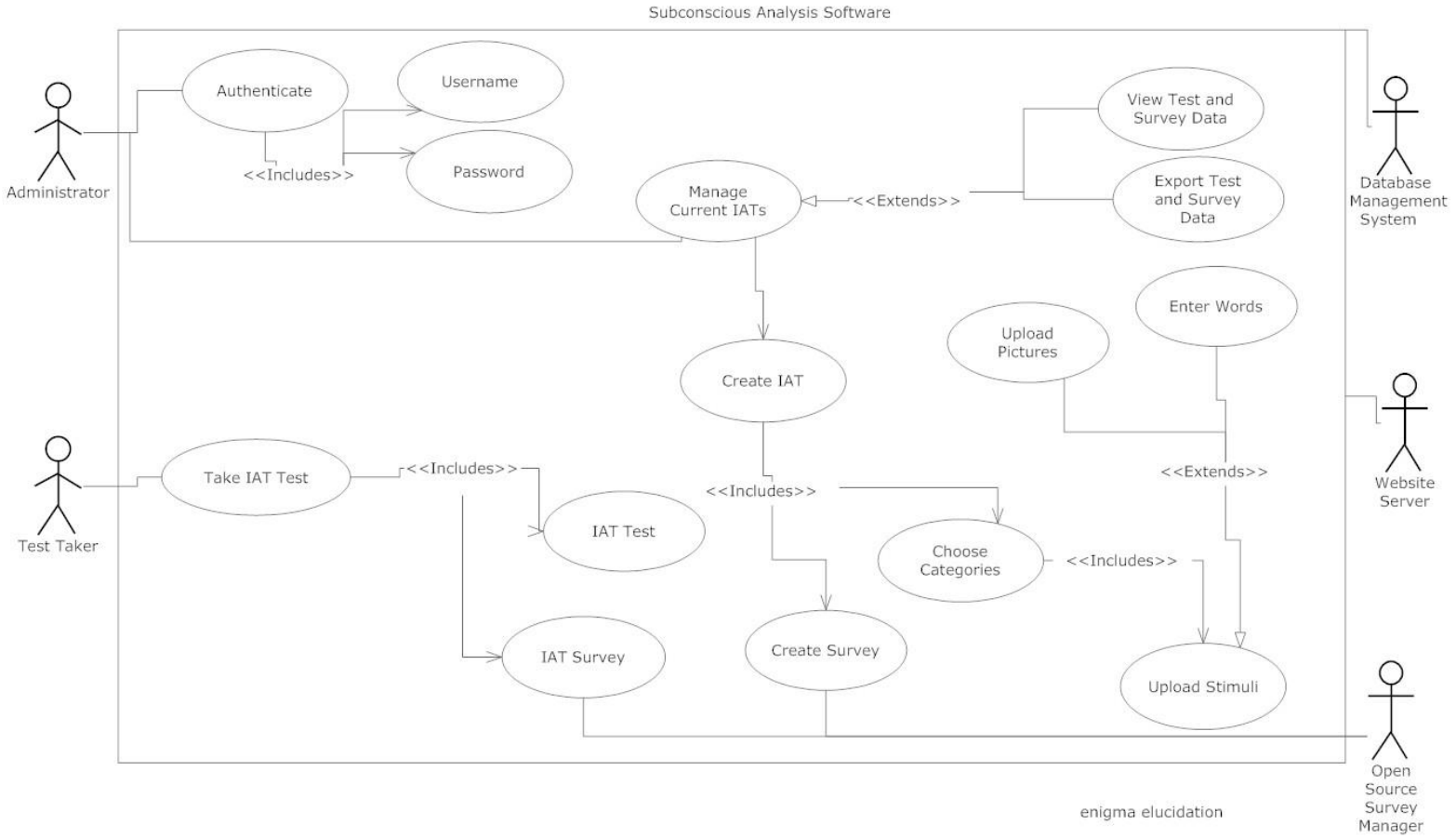
SAS- Stands for Subconscious Analysis Software. This is our project.

Inheritance Arrow- Lines that point from use cases towards their subuses that can function independently from their parent use cases.

Inclusion Arrow- Points from use cases towards their respective included use cases.

Participation Line- Depicts the relationship between actors and their uses.

1.3.2 UML Use Case Diagram



The UML Use Case Diagram shows all the major functions of each user of Subconscious Analysis Software.

1.4 User Case Narratives

There will be two users of Subconscious Analysis Software (SAS), the Administrator and the Participant. While using SAS these two types of users will have access to Implicit Association Tests (IATs), but in separate ways. The admittances of the two users of SAS are described below.

1.4.1 Dr. Breimer / SAS Project Client / SAS System Administrator

There will be a single administrator account for this system. The Administrator will be the client, Dr. Eric Breimer, and anyone else Dr. Breimer decides to share the account with. The Administrator will be able to login to an account on the SAS website with a specified username and password. Once logged in, the Administrator will not only be presented with a list of all the existing IATs, but will also be given several options. The Administrator will have the ability to click on any of the current IATs, which will then allow the Administrator to look at the current data of that IAT. If the Administrator chooses to access the IAT's data, the Administrator will be given a list of all the Participants. The Administrator can then choose to access the data of a specific Participant, where the Administrator will be given a summary of the Participant's experience including the following information: the Participant's answers from the demographic survey; whether or not the Participant completed the IAT; the Participant's latency for each question; the Participant's association scores for each pair of categories; and, anything else relating to the Participant's SAS experience.

Along with the ability to access records for existing IATs, the Administrator will have the ability to create new IATs. The Administrator will be able to create a unique demographic survey to help the Administrator analyze the new IAT. The Administrator can insert categories and selected stimuli associated with these categories. When the Administrator is finished creating an IAT they can save the IAT and a URL will be presented so that the Administrator can give it out to Participants for that particular IAT.

The Administrator may logout of the system at anytime.

1.4.2 IAT Participant

The IAT Participant is anyone who is given a URL to a specific IAT by the Administrator and chooses to take that IAT. When the IAT Participant takes the IAT, the IAT Participant will first be presented with a brief but detailed demographic survey that is associated with the IAT. After completion of the survey, the Participant can take the test. After the IAT is completed, the Participant will be thanked for participating in the Administrator's research interest.

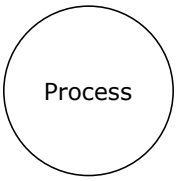
1.5 Data Flow Diagrams

The following data flow diagrams show how data is transferred and manipulated using SAS. The diagram will show the source of the data as well as the functions that can be chosen to transfer or analyze data. The diagrams will also show the sources of data and how that data interacts with SAS and what roles the functions play concerning the data. The following legend will explain all symbols for these diagrams.

1.5.1 Data Flow Diagram Legend

The legend explains all objects used SAS' Data Flow diagrams and what they represent.

Entity - The source of information representing users.



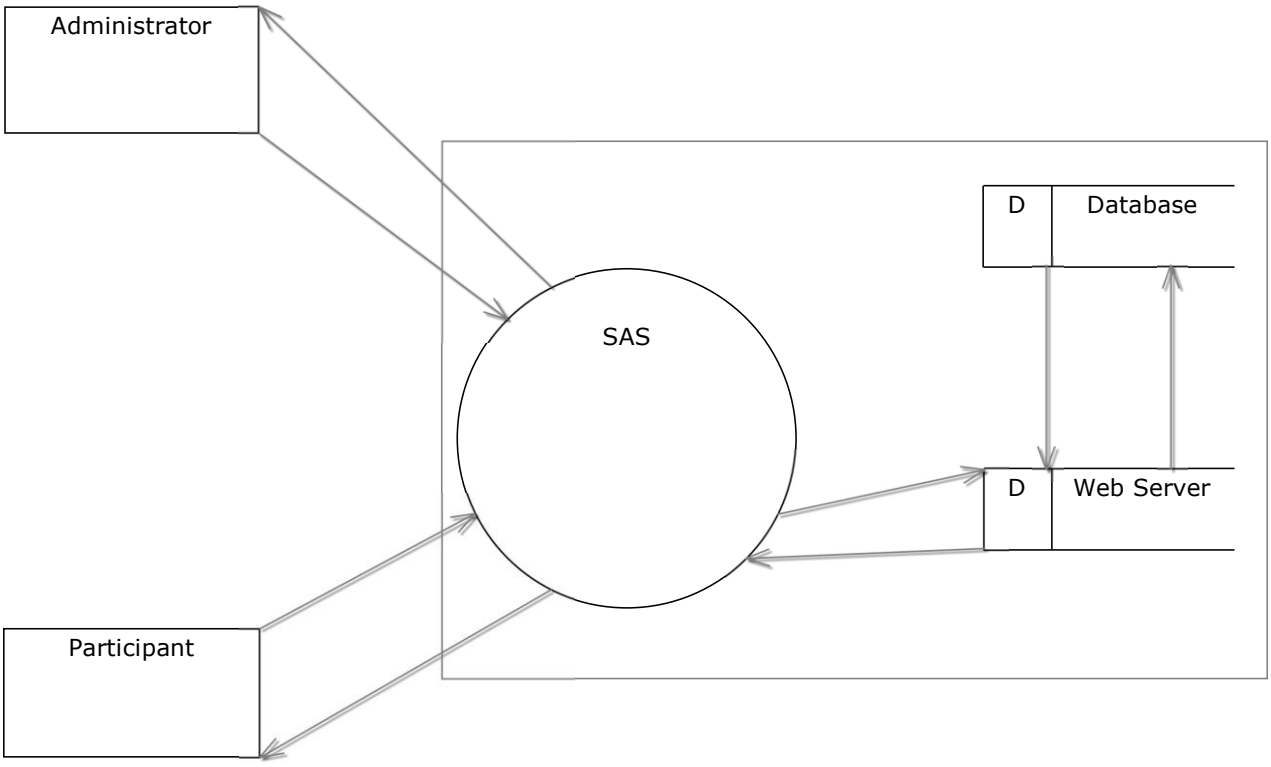
Process - Actions that are performed by the system.

Datastore- Represents where data is stored on the system.

Dataflow - Represents the flow of data throughout the system

1.5.2 Context Diagram

Enigma Elucidation Project SAS
Context Diagram:

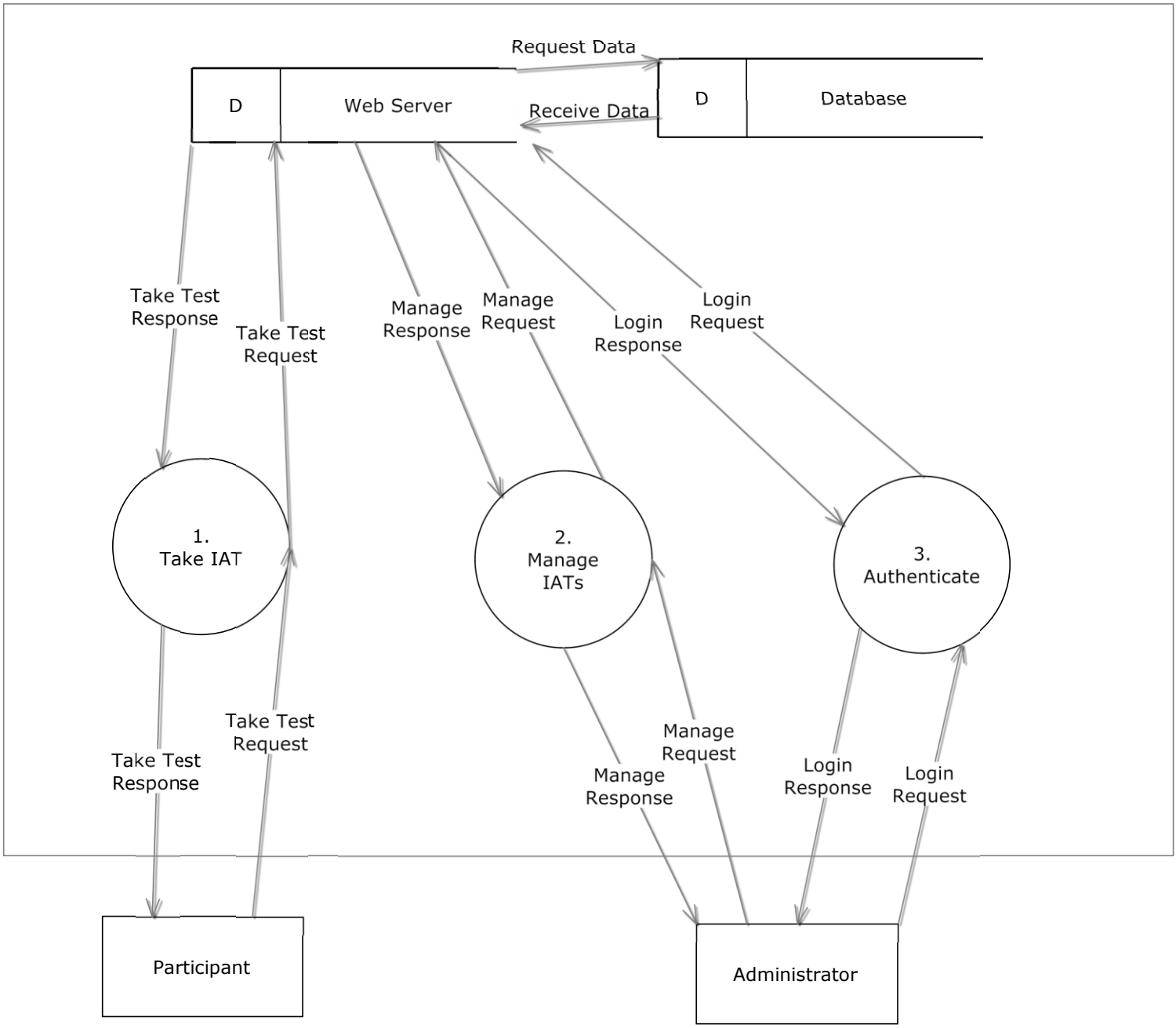


The context diagram depicts a broad representation of the interaction between SAS and exogenous and endogenous agents.

1.5.3 Level 0 Diagram

Enigma Elucidation Project SAS

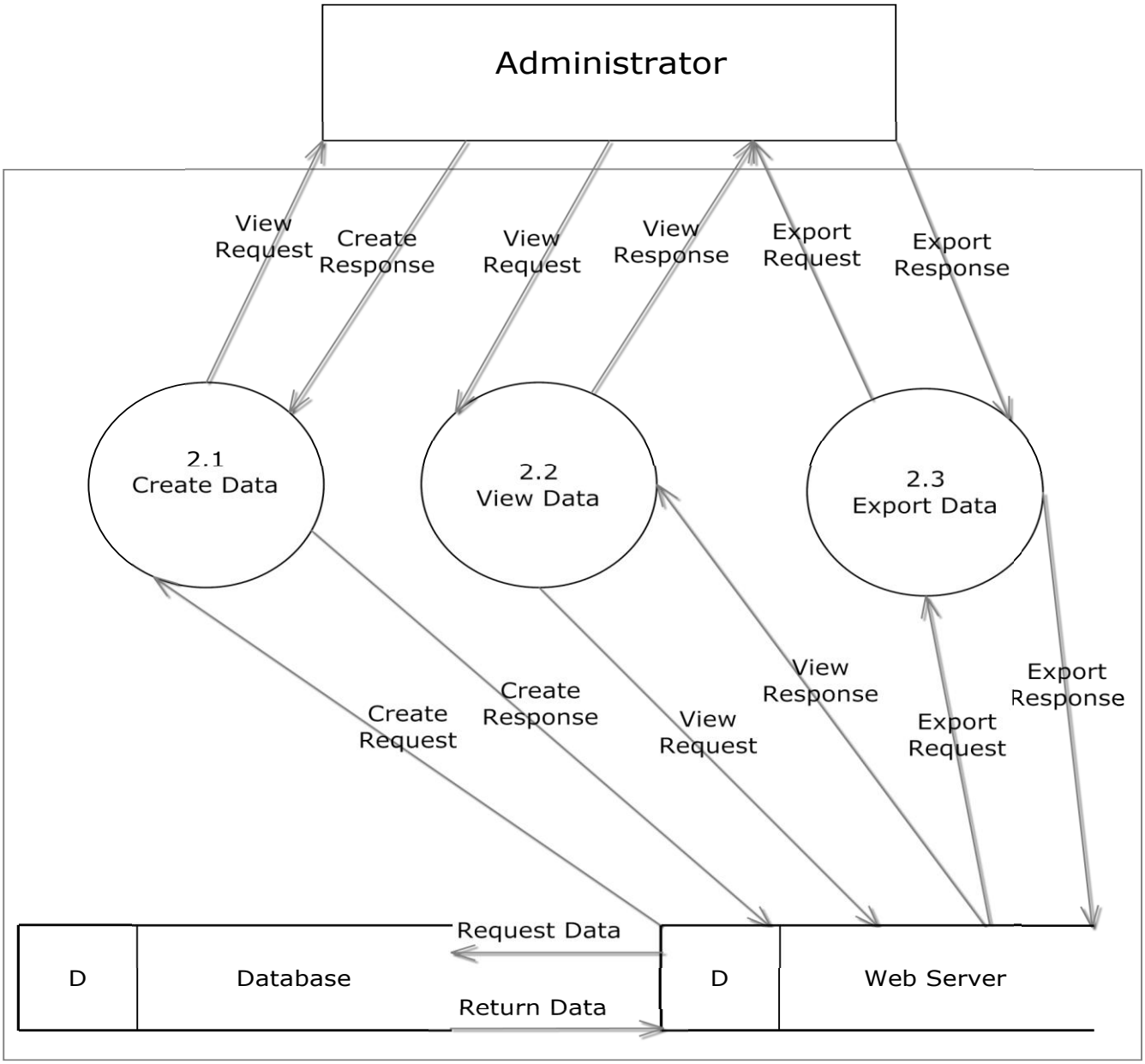
Level 0:



This diagram depicts a detailed interaction or data flow between the entities and the processes of the system. This diagram shows the processes of the function and how they interact with the database and web server. This level 0 diagram expands the context diagram to show the individual functions provided by SAS.

1.5.4 Level 1 Diagram

Enigma Elucidation Project SAS Manage IATs
Level 1:

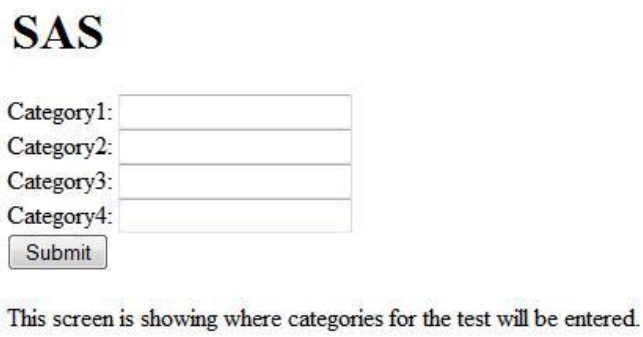


This level 1 diagram expands on the previous function manage IATs. This diagram shows the processes of the function and how they interact with the database and webserver. For example, this diagram shows that the Administrator can request to view data from an IAT, which is accessed from the database and sent back to the user to view.

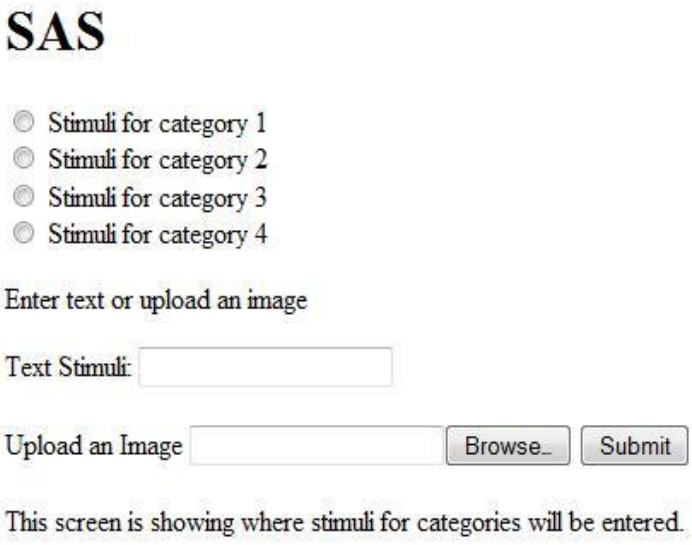
1.6 Prototypes Used for Discovery

When the Administrator accesses the site it will first request that they log in. An example of how this would look is given below.

When Creating an IAT here are some of the options the Administrator will be prompted with:



When Creating an IAT here are some of the options the Administrator will be prompted with. The first is to select the four categories the Administrator would like to test by typing in a category in each of the locations below and selecting the submit button. The format for this function is given below.



The next option the Administrator will be given is to upload images or words as stimuli. The Administrator will select a category to correspond to the new stimuli. The Administrator will do this until they are satisfied with the amount of stimuli objects.

1.7 Functional Requirements Inventory

The Functional Requirements Inventory is a complete list of system functions requested by the client to be developed by enigma elucidation.

This site will have the ability to run on Internet Explorer, Mozilla Firefox, Google Chrome, Safari, and all other major browsers.

There are two user types for Subconscious Analysis Software, the Participant and the Administrator. The following is a list of the functional requirements for each user**.**

Participant:

- Will be able to take IAT
    - Will be able to fill out demographic survey
    - Will be able to answer questions presented in IAT
- Will have the option to view results of their test

Administrator:

- Will be able to login into the System with registered user name and password
- Will be able to create IAT
    - Will be able to create survey
    - Will be able to choose categories for IAT
    - Will be able to upload stimuli, words and images
- Will be able to view all IATs
- Will be able to view all participants
    - Will be able to view survey results
    - Will be able to view IAT Test results
- Will be able to run algorithm to analyze data???
- Will be able to log out of the system

1.8 Non-Functional Requirements Inventory

The following is a list of non-functional requirements of SAS. Below are requirements that specify how the system should be; that is, what qualities the system should have as opposed to what the system should do (functional requirements).

- The system must be aesthetically pleasing
- The system must be easy to use
- The system must be independent of any localized server
- The system must be platform independent

1.9 Exception Handling

There are several exceptions we have already anticipated and established solutions for handling them. These exceptions and how we treat them are below.

Identified exceptions for Participants are:

- If the Participant misses a required field in the survey, the Participant will be prompted with an message asking them to please fill out required fields.
- If the Participant's response times are either too slow or too fast, the Participant's results will not be recorded
- If the Participant hits foreign keys during the test, the Participant will be notified so they may find the correct keys
- If either the connection is lost while taking an IAT, or the Participant closes the window, the results will not be recorded

Identified exceptions for the Administrator are:

- If the Administrator uses an incorrect username and password combination, he will be notified, and asked to re-enter his username and password
- If the Administrator fails to input all four category titles, or enters the same name for multiple categories, the Administrator will not be able to proceed to the next step of inputting stimuli and will be asked to re-enter the categories
- If the Administrator attempts to upload an incompatible file type for an image stimuli object, the Administrator will be prompted with an error message and the file will be rejected
- If the Internet connection is lost while attempting to create an IAT, the data will not be stored
- If no Participants have taken an existing IAT that the Administrator wishes to view data for, then the Administrator will be prompted a message informing that there is no data to view
- If the Administrator uses an incorrect username and password combination, he will be notified, and asked to re-enter his username and password
- If the Administrator fails to input all four category titles, he will not be able to proceed to the next step of inputting stimuli and will be asked to re-enter the categories

At this time it is unclear what other types of exceptions SAS will encounter. However, as we progress further into development and design, we will have a better idea of what exceptions we will have to handle.

1.10 Early Subsets and Implementation Priorities

The important components of SAS are

- The ability to select images for the creation of new IATs.

- The ability to select category names for the creation of new IATs.
- The ability to create and upload an IAT to a website.
- The ability to create a survey that links to the IAT test after creation
- The ability to store the data generated by the IAT survey and IAT test into a database.
- The ability to export the data in the database into a format easily manageable by the Administrator.

1.11 Foreseeable Modifications and Enhancements

Our client, Dr. Breimer, has expressed to us that he would like to edit the IAT's he has created and analyze the data that is collected from each test that is taken. These functions are not required to be part of SAS but if time allows we plan to work toward these functions, only after our software performs to the satisfaction of the client.

1.12 Acceptance Criteria and Testing Requirements

The acceptance criteria for Subconscious Analysis Software will be outlined by the functional requirements and non-functional requirements inventories listed in sections 1.7 and 1.8 above. The functional requirements inventory explains what SAS will functionally be able to do as designed by enigma elucidation. The non-functional requirements inventory, however, explains what SAS will be and therefore, what the qualities of the system are. The functional and non-functional requirements listed in this document are subject to change upon request by Dr. Breimer and/or new ideas gathered by enigma elucidation's team members.

Subconscious Analysis Software will be tested on both Mac and Windows operating systems and on several browsers including Internet Explorer, Mozilla Firefox, Google Chrome and Safari. All testing requirements will be decided upon and developed by enigma elucidation. Each functional requirement will first be tested individually. When and if each functional requirement is properly working, the entirety of SAS will be tested as a software system. The testing requirements will be explained in further detail in the Preliminary Design and Detailed Design documents, which deadlines are marked in our timeline located in Appendix B. The results of these tests will be described in the Acceptance Test document, where it will be determined whether or not all the requirements were met and if SAS is functioning properly.

1.13 Hints and Guidelines

The following guidelines have been established for the implementation of SAS:

- Use open source codes for implementing survey functions
- Every IAT created should be given a unique folder name for organization
- All stimuli objects should have a unique generated name for each which includes the name of the IAT it is associated with
- All stimuli objects should be saved in the same location/folder
- Use JavaScript
- Generate queries for results

These guidelines and hints are subject to change due to any changes made by our client to the required functions or to improve the functionality of SAS.

Appendix A: Sources of Information

All of the information given in this document was obtained from:

- Meetings with our client, Dr. Breimer
- Dr. Lederman
- Software Engineering Lectures
- Documents of Past Software Engineering Teams
- Harvard's Project Implicit at https://implicit.harvard.edu/implicit/
- *Measuring Individual Differences in Implicit Cognition: The Implicit Association Test* by Anthony G. Greenwald, Debbie E. McGhee, and Jordan L. K. Schwartz
- *Understanding and Using the Implicit Association Test: I. An Improved Scoring Algorithm* by Anthony G. Greenwald, Brian A. Nose, and Mahzarin R. Banaji

Appendix B: Glossary of Terms

CSS (Cascading Style Sheets) – A style sheet language used to style webpages written in HTML and XHTML

Data Flow Diagram (DFD) **–** a graphical representation of the *flow* of data through a software system

Database – An organized collection of data for one or more uses, typically in digital form

UML (Unified Modeling Language) **–** a specification language used in software engineering

UML Use Case Diagram – a behavioral diagram used to identify the requirements of a system

Apache – a free HTTP Server that works with PHP and MySQL database.

MySQL – a open source relational database management system

Chrome -Web browser designed by Google

Firefox - Internet browser designed by Mozilla

Gantt Chart – Gantt charts illustrate a project schedule specifying the start and finish dates of the terminal elements and summary elements of a project

HTML (Hyper Text Markup Language) – language for creating web pages

IAT (Implicit Association Test) – psychology test that determines a participants biases

Internet Explorer (IE)- Internet browser designed by Microsoft

PHP (PHP Hypertext t Preprocessor) – server side HTML scripting language

Prototype – A rudimentary depiction of the design of the final product

Safari – Web browser designed by Apple

SAS – Subconscious Analysis Software, the software system.

Appendix C: Timeline