Software Requirements Specification

Team Wow

Product: Food Data

Helping food science with data gathering and analysis software

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11/27/2017

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1. Introduction

1.1 Purpose

The purpose of this software requirements specification is to layout the functionality of the website made for Dr. Gee with the purpose of assisting data gathering and analysis for the Health Sciences department of Central Washington University. This software requirements specification is for the reference of the programming team which contains Shaina Greer-Short, Frank Senseney, Geoff Worley, and Connor Taylor. It is also for the project advisor, Dr. Szilard Vajda, and the client, Dr. David Gee.

1.2 Scope

The software product to be produced is a website called "Food Data". Food Data will allow users to create sensory evaluation tests (see section 1.3) that can be used by judges when judging food samples for certain qualities. Currently, judgements are written on paper and transcribed into spreadsheets for Microsoft Excel. The objective of this product will be to automate this process of gathering and organizing data from sensory evaluation tests. This data shall automatically be condensed into an Excel spreadsheet for downloading and further analysis per the goals of the Health Sciences department.

1.3 Definitions, Acronyms, and Abbreviations

CWU – Central Washington University

Sensory Evaluation – a scientific discipline that analysis and measures human responses to the composition of food and drink

Reference Sample - A sample you give the judge that shows the scale. For example, you give the judge a piece of cake and say that this cake is a five on a sweetness scale of 1 to 10. Then the judge can judge the sweetness of the other samples given to them.

1.4 References

Appendix, Document A. Questionnaire for Tenderness, 11/11/2017, Central Washington University

Appendix, Document B, SIMS Sensory Software, 11/14/2017, http://www.sims2000.com/

1.5 Overview

The rest of this software requirements specification contains a clarification of the scope and requirements of this product. Details on product function and use are contained in section 2. The technical details for this project are contained in section 3.

2. Overall Description

2.1 Product Perspective

Food Data is based on a similar product, SIMS Sensory Software (see Appendix, Document B). SIMS Sensory Software provides additional data analysis functionality which Food Data will not. While used in industry, this software provides unnecessary functionality, and is costly to install and maintain. Food Data will be a stand-alone product which facilitates information gathering and organization without extensive costs for installation and maintenance. Any analysis of sensory evaluation test data is done per course and faculty objectives. Per the request of the client, Food Data will be implemented as a website to facilitate a compact, easily-accessible service usable among many standard mobile devices, including Android, OSX, Windows, etc. This section includes details about interfaces, constraints, and functions.

2.1.1   System Interfaces

There will be three system interfaces: First is the test interface, where users will be able to create and manage sensory evaluation tests. Second is the judge interface where judges will fill out forms with test data, which will then be organized and converted into a properly-formatted Excel spreadsheet file for download. Third is a create account and sign-in interface, which will handle the creation and management of new judges and administrative user accounts.

2.1.2   Interfaces

All three interfaces will use a graphical user interface to receive input from users. There are no special interface requirements beyond physical limitations of the device, Microsoft Excel 2010, and those included with HTML 5.

2.1.3   Software Interfaces

2.1.3.1 Microsoft Excel 2010. The system must process test data into a spreadsheet file for use with Microsoft Excel 2010. These files will be extracted via download from the server.

2.1.4   Communication Interfaces

Which communications interfaces being used are not entirely clear.

2.1.4.1 Transmission Control Protocol, RFC 793
2.1.4.2 Internet Protocol, RFC 791

2.1.5   Memory Constraints

There are no memory constraints.

2.1.6   Operations

We believe that there will be no normal or special operations required by the user, but we are not yet sure.

2.2 Functional Requirements

2.2.1   The software should allow people to create accounts and sign in to those accounts.
2.2.2   The software should allow users to create sensory evaluation tests.
2.2.3   The software should allow tests to be copied, this means that if a test is copied than the copy is the same, but it does not have any data saved for it.
2.2.4   There should be three distinct types of tests that can be created: Triangle tests, where the judge is given 3 samples where 2 are the same and 1 is different and is asked which is different. The Duo/Trio test, where the judge is given three samples one as a reference and two others and is asked to determine which sample is the same as the reference. And the intensity test, where judges are asked to "quantify" a subjective quality of product on a scale, usually between values of 1 and 9 (e.g. saltiness, moisture, texture, etc.).
2.2.5   For the Triangle test and the Duo/Trio test, the website should provide the information on how many judges got it right out of the amount tested (e.g. 10 out of 20 judges indicated the correct sample).

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2.2.6   For the intensity tests, the user should be able to test multiple factors at once (e.g. saltiness, and firmness).

2.2.7   The software should include a reference sample in the Intensity Test.

2.2.8   For the intensity tests the user should be able choose the number of samples (without the reference if there is one), the type of scale, and the quality that is being tested for.

2.2.9   For the type of scale there should be options for an unstructured scale or a point value scale (see Appendix, Document A).

2.2.10 The range of point values of a scale should be up to the user.

2.2.11 The person who creates the test should be able to add descriptive terms to as many of the values as they want on the point scale (e.g. on a 1 to 9 scale only 1 and 9 could have descriptive terms, or every other number could have descriptive terms, etc.).

2.2.12 The software should provide random three-digit identification codes for each of the samples used in a test.

2.2.13 The software should provide a document that can be printed out which provides the three-digit identification codes for each item and the sample which each code belongs to.

2.2.14 The software should provide an interface where judges can judge different samples for a variety of variables (see Appendix, Document A).

2.2.15 The software should provide a randomized order to the samples to reduce the possibility of bias in testing.

2.2.16 The software should store and organize test data into an Excel spreadsheet file which the user of the test may print out.

2.2.17 The software should provide a page for every test that users can show judges an example of what they will be doing when judging.

2.2.18 The software should provide a "How to" page which users can reference to learn how to use the various aspects of the website.

2.2.19 The software should be capable of being used by at least ten users at the same time.

2.3 User Characteristics

The intended users of this product should be students taking appropriate courses in health science and members of faculty. Students will be instructed on the proper use of the product. The design of this product is intended to be simple, straightforward and intuitive to users of any technical skill level.

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2.4 Constraints

This product is intended to be hosted by CWU, and will thus abide by constraints outlined by university policy and technology standards.

2.5 Assumptions and Dependencies

1. The product can function properly on any mobile device capable of using HTML-based web interfaces.
2. The product is going to be a website and not an application.
3. Central Washington University will be willing to host the website.
4. The product will keep temporary storage of test data input by users in a database.

2.6 Apportioning of Requirements

There is supposed to be only one version of this system so there should be no apportioning of requirements. Requirements of lowest priority and therefore requirements that might not be implemented because of time constraints include the ability of tests to be copied, a how to guide for users, a sample test that can be shown to judges and for the triangle and duo/trio tests the number of judges that got it right might not be shown on the website. Of second lowest priority requirements that also might have to be cut if time becomes a factor are the ability to login to the website, the ability to have a reference sample in an Intensity Test. the option of the triangle test, the option of the Duo test and the option of the Trio test. All other requirements must be completed for the software to be useable.

2.6.1 Stage 1

2.6.1.1 The software should allow users to create sensory evaluation tests.

2.6.1.2 Have the option to create an intensity test.

2.6.1.3 For the intensity tests, the user should be able to test multiple factors at once (e.g. saltiness, and firmness).

2.6.1.4 For the intensity tests, the user should be able choose the number of samples, the type of scale, and the variable that is being tested for.

2.6.1.5 For the type of scale, there should be options for an unstructured scale or a point value scale (see Appendix, Document A).

2.6.1.6 The point value of the scale should be up to the user.

2.6.1.7 The person who creates the test should be able to add descriptive terms to as many of the values as they want on the point scale (e.g. on

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a 1 to 9 scale only 1 and 9 could have descriptive terms, or every other number could have descriptive terms, etc.).

2.6.1.8   The software should provide random three-digit codes for each of the samples.

2.6.1.9   The software should provide a document that can be printed out that provides the three-digit codes for each judgement and the sample that each code belongs to.

2.6.1.10 The software should provide an interface where judges can judge different samples for a variety of variables (see Appendix Document A).

2.6.1.11 The software should provide a randomized order to the samples, so that the samples are not always presented to the judges in the same order).

2.6.1.12 The software should store and organize test data into an Excel spreadsheet file, which the user may print out.

2.6.2 Stage 2

2.6.2.1   The software should allow people to create accounts and sign in to those accounts.

2.6.2.2   Have the ability to include a reference sample in the intensity test.

2.6.2.3   Have the option to create triangle tests.

2.6.2.4   Have the option of creating a Duo/Trio Test.

2.6.3 Stage 3

2.6.3.1   The software should allow tests to be copied, this means that if a test is copied than the copy is the same, but it does not have any data saved for it.

2.6.3.2   The software should provide a "How to" page which users can go to learn how to use the various aspects of the website.

2.6.3.3   The software should provide a page for every test that users can show judges an example of what they will be doing when judging.

2.6.3.4   For the triangle test, and the Duo/Trio test, the website should provide the information on how many judges got it right out of the amount tested (e.g. 10 out of 20 judges indicated the correct sample).

3. Specific Requirements

3.1 External Interfaces

3.1.1   CWU username. The system should allow the user will input their username and password to create and sign into their account. This CWU sign in page will be used for this input.

3.1.2   CWU password. The system should allow the user will input their username and password to create and sign into their account. This CWU sign in page will be used for this input. After the username and password are input the computer will take the user to the website.

3.1.3   Name test. The system shall allow the user will input a name when creating a test that the test will be saved under. This will be a string input of max length 20. This will be input at the same time as the description.

3.1.4   Description test. The system shall allow the user will input a description when creating a test that can be seen when viewing tests. This will be a string input of max length 100. This will be input at the same time as the name.

3.1.5   Type test. The system should allow the user to choose which type of test they want to make. The options will be "Triangle Test", Duo/Trio Test, and "Intensity Test". This should occur at the same time the user has named the test an input a description. This input will be a check box which will be saved as an integer option.

3.1.6   Variable being Tested. The system shall allow the user to input an string of max length 10 that will indicate the variable that is being tested. This shall be done right after the name of the test, test description and the type of test is input if the type of test is "Intensity Test".

3.1.7   Description of Variable. The system shall allow the user to input an string of max length 100 that will describe the variable that is being tested and give a general description of what the judge should judge based on. This shall be done at the same time the variable being tested is input if the type of test is "Intensity Test".

3.1.8   Reference Sample. The system should allow the user to check whether or not their will be a reference sample for the test. This answer will be saved as a boolean value. This shall be done right after variable information is input if the type of test is "Intensity Test".

3.1.9   Number of Samples. The system shall allow the user to input an integer for the number of samples that are to be tested at once (not including the reference

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sample if there is one). This shall be done at the same time that the reference sample option is entered.

3.1.10   Type of Scale. The system shall allow the user to choose which type of scale they want to use for their test. The options for the type of scale will be "Unstructured Scale" and "Point Scale". This should occur at the same time the user has input the number of samples. This input will be a check box which will be saved as an integer option.

3.1.11   Number of Points. The system shall allow the user to input the amount of points they want on the point scale. This input will be an integer. Number of Points will be input after Type of Scale is input if the user chooses "Point Scale" for Type of Scale.

3.1.12   Descriptive Terms. The system shall allow the user to input the descriptive terms for the test. Each descriptive term will be a string of max length 10. Descriptive terms will be input after number of points is input or after type of scale is input if "Unstructured Scale" is input for the type of scale. If "Unstructured Scale if the input for type of scale the user will be required to input two descriptive terms one for the low end of the scale and one for the high end of the scale. Otherwise the user will be able to input an amount of descriptive terms less than or equal to the number of points in the point scale. Each descriptive term must match up with a point in the point scale.

3.1.13   Add Variables. The system shall allow the user to add additional variables they want to test for. After the user has input descriptive terms they will have the option to save the test or add an additional variable. Adding an additional variable will make the system go back to the variable being tested input page.

3.1.14   Name Judge. The system shall allow the judge to input a name on the judgement form. The name will be a string of max length of 20. The name, date and score will all be entered at the same time (see Appendix, Document A).

3.1.15   Date Judge. The system shall allow the judge to input a date on the judgement form. The date will be input using a calendar choice option. The name, date and score will all be entered at the same time (see Appendix, Document A).

3.1.16   Score Judge. The system shall allow the judge to input a score for each sample on the judgement form. The score will be an integer if the scale is a point scale. If the scale is an unstructured scale the input will be a mark on the vertical line. This mark will be input into the excel sheet as an integer between 0 and 100. The name, date and score will all be entered at the same time (see Appendix, Document A).

3.1.17   Excel. The system shall allow the user to download judgements as an Excel spreadsheet document.

3.1.18 Random Digits. The system shall allow the user to print a document with random three digits codes attached to samples. This will be an option when viewing a test.

3.2 Functions

3.2.1 The system shall check all inputs to ensure they are valid.

3.2.2 The system shall follow the exact sequence of operations.

3.2.3 The system shall respond to all improper inputs by outputting a message to the user saying, "incorrect input".

3.2.4 The system shall respond to all other errors by outputting a message to the user saying, "Error: please reload the page".

3.2.5 The system shall save all judgment inputs ion an excel document.

3.3 Logical Database Requirements

3.3.1 The database should have a "Test" table which will have the ids for all the tests in it (integer) and the type of test (sting "Intensity", "Triangle", or "Duo/Trio"). The test id will be the key to this table.

3.3.2 The database will have an "Intensity Test" table that will have all the intensity tests created in it. This table data will include the test id (integer), the name of the test (string max length 20), the description of the test (string max length 100), whether there is a reference sample, the number of samples (integer), the username of the creator of the test (string max length 10), the password of the creator of the test, the date the test was created (date) and the name of the excel document associated with the test (string max length 10). The test id, the username of the creator, the password of the creator, the date the test was created, and the name of the excel document will all be automatically populated. The name of the test, the test description, the number of samples will all be user inputs. The test id will be the key to this table. The product will automatically input data for all tests that are said to be "Intensity Tests" into this table. The test id will connect the "Intensity Test" table to the "Test" table.

3.3.3 The database will have a "Variable" table which will contain all the variables of each test. This table will have data for the test id (integer), the variable id (integer), the variable being tested (string max length 10), the description of the variable (string max length 100), the type of scale ("Unstructured Scale", or "Point Scale"), and the number of points (integer). The variable id, and the test id will be automatically populated. The test id will connect the variable to the test it is associated with. The variable being tested, the description of the variable, the type of scale, and the number of points in the scale will be input by the user. The

variable if will be the key to this table. If the table is has an "Unstructured Scale" than the number of points will be automatically be allocated 2. The product will check that there is a test with the given id before creating the form.

3.3.4   The database will have a "Descriptive Term" table which will contain the descriptive terms for each variable for each table. In this table each descriptive term will have an id (integer), a variable id (integer), a name (string max length 10), and a number associated with the descriptive term (integer). The descriptive term id will be the key to the table. The variable id will connect the descriptive term to the associated variable. The product will check that the number associated with the descriptive term is more than or equal to 0, but less than the number of points in the associated variable. The product will check that there is a variable with the given id before creating the form.

3.3.5   The database will have an "Difference Test" table that will have all the difference tests created in it. This table's data will include the test id (integer), the name of the test (string max length 20), the description of the test (string max length 100), the type of test ("Triangle Test" or "Duo/Trio Test"), the number of samples (integer), the variable being tested (char max length 100), the description of the variable (string max length 100), the low end descriptive term (string max length 10), the high end descriptive term (string max length 10), the username of the creator of the test (string max length 10), the password of the creator of the test, the date the test was created (date), and the name of the excel document associated with the test (string max length 10). The test id, the username of the creator, the password of the creator, the date the test was created, and the name of the excel document will all be automatically populated. The name of the test, the test description, type of test, the number of samples will all be user inputs. The test id will be the key to this table. The product will automatically input data for all tests that are not "Intensity Tests" into this table. The test id will connect the "Intensity Test" table to the "Test" table.

3.3.6   CWU will deal with the database and tables needed for user authentication.

3.4 Software System Attributes

3.4.1   Reliability

3.4.1.1   95% of the software system will work correctly.

3.4.1.2   95% of the time the software system will work correctly.

3.4.2   Availability

3.4.2.1   The software system will be available 24 hours a day, seven days a week.

3.4.2.2   The software system will lose at most 5 minutes of data after a failure.

3.4.2.3   The software system will lose at most 5 minutes of data after an accidental shutdown.

3.5 Views

3.5.1   System Mode

3.5.1.1   In design mode the program shall allow access to all the website.

3.5.1.2   In judge mode the program shall only show the form that is to be filled out.

3.5.2   User Class

CWU will deal with user authentication.

3.5.2.1   For the administrative user, the program shall enable access, use and design of all tests. The administrative user will be able to publish tests that then all users will be able to see. The administrative user will have to confirm people who sign up for an account before they will be allowed access to their account.

3.5.2.2   For account users, the program shall allow the design and use of tests that the specific user creates.

3.5.2.3   For users without an account the program shall allow viewing of the website, but shall not allow any design or use of tests

3.6 Requirements Check

3.6.1   All requirements appear feasible although some may be discarded if time becomes a factor.

3.6.2   All requirements are consistent.

3.6.3   All requirements are consistent so no validity check is required.

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Appendix

Document A

A copy of the current written judgement sheet for both the unstructured scale (above) and the point scale (below a 9-point scale).

Questionnaire for Tenderness

Name _____   Date _____

Evaluate the following cake samples for tenderness using the following unstructured scale by making a vertical line indicating your tenderness rating.

SAMPLE   Firm   Very
                                                                                                  Soft

------   -+--+-

------   -+--+-

------   -+--+-

------   -+--+-

------   -+--+-

------   -+--+-

Questionnaire for Textural Acceptability

Name _____   Date _____

Exceptional quality cakes should have a **fine and even textural appearance, thin cell walls, small air cells, and have a soft velvety texture.** Evaluate the following cake samples using a **9-point** scale where:

        1 = poor textural quality cake
        5 = acceptable textural quality cake
        9 = exceptional textural quality cake

Sample   Acceptability Score

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

Document B

A screen shot of the SIMS Sensory Software website.

The website is http://www.sims2000.com/.

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