7.0 System Coding

7.1 Programming Language

There are various programming languages used in the proposed Decision Support System for Sugar Regulatory Administration. These programming languages are Java, JSP, HTML, and SQL.

Java technology is high-level programming language. The java programming language provides a portable, interpreted, high-performance, simple, and object-oriented programming language which also supports run-time environment. It is object-oriented yet simple. The development cycle is much faster because it is interpreted, the programmer can easily compile then run the program he is creating. It is also said to be portable across different platforms, the programmer needs to write the codes once and he doesn't have to port it anymore since it runs on different platforms and across different hardware architectures. It is robust because the Java runtime environment manages the memory for the programmer. It provides high performance interactive graphical applications because the multiple concurrent threads of activity of the application are supported by multithreading built in the Java programming language. It is adaptable to changing environments because one can easily download code modules from anywhere in the network. Lastly, end users can trust that the applications made are secure since Java runtime environment has protection against viruses and tampering.

HyperText MarkUp Language (HTML) is a programming language used for website creation. It consists of a series of short codes typed into a text-file which are called tags, and then saved as an html file and viewed through browser like Internet Explorer, Mozilla FireFox, etc. It reads the file and transforms the text into visible form according to what the user had coded. It only requires the programmer to use the proper tags to come up with the desired output. It only takes of reading and learning the codes, however, the basics can be learned in an hour.

JavaScript allows even complete non-programmers to add interactivity in their web pages. Using this will be really simple for anyone who has an experience in using an objected-oriented programming. It is not a stand-alone programming language, it is just an add-on or extension to HTML. It is basically added to HTML simply through the use of <SCRIPT> tag. It is the most popular scripting language of its cross-browser and cross-platform support. (Smith, D., 1998)

JavaServer Pages (JSP) is a programming language that enables Web developers to easily develop, maintain information-rich and dynamic web pages. It separates the user

interface from content generation which allows developers to easily design the layout of the webpage without affecting the underlying dynamic content. (Java Server Pages Overview, n.d.)

JSP is used to create dynamic web pages, which is easier to navigate and contains more information with less time for loading. It is also similar with Java to which we have been using, thus creating dynamic pages are easier and more understandable to provide the end-users easy time in using the system.

Structured Query Language (SQL) is one of the most popular database application computer languages. It has both simple and complex database management protocols, like to basic input of data and deletion of queries to using complicated queries, manipulation and reporting of highest order.

SQL is the basic tool for handling data in the database and manipulating data to come up with reports. SQL is the language we know of when database is needed. It allows us to easily add data to the database which will be accessed by the system we are developing. It allows us to manipulate the data in the database yet keeping the integrity of the data stored. It allows input and retrieve database by just inserting SQL in jsp files when coding.

7.2 Special Purpose Language Tools

The tools used are Netbeans, MySQL Workbench, HighCharts and Android Studio

Netbeans is an open source IDE that for developing with multiple languages such as Java, PHP and C++. Netbeans is also used for developing web applications as used in the capstone project.

Highcharts was the tool used to generate and display interactive charts inside the webpages. This tool offers different kinds of charts and is highly customizable.

JDBC drivers are used to communicate JSP applications with databases, ODBC however may also be used to communicate if one has an JDBC-ODBC bridge driver. It acts as an interpreter between your ODBC and JDBC.

7.2 Programming Standards

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The naming convention that the group used was in terms of pages having the names in relation to what it does. Examples would be Recommendations.jsp where the name of the file is what the page does as its functionality. Another would be specifying the user in the filename. Example would be Homepage_board.jsp which indicates the starting page for a specific user.