**Lab II - Product Specification Outline**

CS 411W Lab II

Prototype Product Specification

For

CLASH

Example: (Not finished Outline)

1. Introduction
   1. Purpose
   2. Scope
   3. Definitions, Acronyms, and Abbreviations
   4. References
   5. Overview
2. General Description
   1. Prototype Architecture Description
   2. Prototype Functional Description
   3. External Interfaces
   4. Virtual Machine
   5. Prototype Functional Description
   6. Interface (Ming)
3. Specific Requirements
   1. Functional Requirements (Fizz/Francia/James/Charles/Justin)
   2. Performance Requirements (Francia/Cory)
   3. Assumptions and Constraints
   4. Non-Functional Requirements

Appendix

Questions to ask:

When doing sub classes do you order by alphabetical order or by importance?

Is outline missing anything specific you want to see?

Does Scope mean aim of the product? Would it be Case study?

Is 1.1 Purpose going in the right direction?

Do I need to add diagrams that shall be used?

2.3 shows two module but in truth there are three modules? Agree? Disagree?

**1. Introduction**

**1.1 Purpose**

1. Providing a tool for aiding ESL students in learning English

a. How It Shall Be Used

b. Who Shall Use It (Lab 1: Target Market Customer Base)

c. What It Shall Do (Lab 1: Product Features & Capabilities)

i. Identify Parts of speech in a text document

ii. Uniquely color identified requested parts of speech

iii. Insert slashes to break text into lexical bundles

iv. Display lexical bundles in a speed controlled reader

d. What It Won’t Do

**1.2 Scope**

1. Old Dominion University

a. English as a Second Language Class

**1.3 Definitions, Acronyms, and Abbreviations**

**CLASH** - Color Lexical Analysis algorithm and Slash Handler

**COLRS** – Colored Organized Lexical Recognition Software

**ELC** – English Learning Center

**ELL** – English Language Learners

**ESL** – English as second language

**GB** – Gigabyte

**GUI** – Graphic User Interface

**HMTL** – HyperText Markup Language

**IBT** – International benchmark test

**JS** - JavaScript

**JSON** – JavaScript Object Notation

**LB** – Lexical Bundle

**Lexical Bundle** – a group of words that occur repeatedly together within the same register

**MFCD –** Major Functional Component Diagram

**NLP** – Natural Language Processing

**NLTK** – a suite of libraries and programs for symbolic and statistical natural language processing (NLP) for the Python programming language.

**Node.js** – an open source, cross-platform runtime environment for server-side and networking applications.

**ODU** – Old Dominion University

**POS** – Parts of Speech

**SPA** – Single Page Application

**Single Page Application** - a highly responsive web application that fits on a single page and does not reload as the web page changes states.

**TOEFL** – Test of English as a Foreign Language

**Ubuntu** – a Debian-based Linux operating system.

**VM** – Virtual Machine

**1.4 References**

1. McKeon, D. (n.d.). Research Talking Points on English Language Learners. Retrieved December 11, 2014.

2. Tremblay, A., Derwing, B., Libben, G., & Westbury, C. (2011, January 15). Processing

3. Advantages of Lexical Bundles: Evidence From Self-Paced Reading and Sentence Recall Tasks Retrieved December 10, 2014.

4. Mikowski, M., & Powell, J. Single Page Applications. Manning Publications 2014.

5. CS410 Lab 1

**1.5 Overview**

**2. General Description**

**2.1 Prototype Architecture Description**

1. MFCD (Prototype)

Figure: MFCD

**2.2 Prototype Algorithms**

**2.3 Single Page Application**

1. Shell

2. Color Module

3. Slashed Reader Module

**2.4 Virtual Machine**

1. node.js

2. ngnix

3. MySql

**2.5 Prototype Functional Description**

**2.6 Interfaces**

1. Hardware Interfaces

2. Software Interfaces

a. JavaScript webserver interfaces

b. Database interface/web server interface

3. User Interface

a. Browser

4. Slash Module. This module shall accept JSON input from COLRS module and break document into lexical bundles.

a. Insert Slashes. This function shall insert slashes based on:

1. Slash after each period, comma, semicolon, colon, or question mark
2. Slash before each preposition
3. Slash before each conjunction
4. Slash shall not be place within any phrases list in Exception List
5. **Specific Requirements**

This section contains the detailed requirements. Each requirement should be a single statement that describes a key attribute of the product. Requirements under each subsection should be grouped into functional areas. A functional area is a grouping of related requirements that provide related functionality

* 1. **Functional Requirements**

State each functional requirement in a concise and complete format

* + 1. **User Interface.**

The user interface shall be entirely web page based. The following functional requirements must be provided: (The term “mode” is used herein to indicate a portion of the web interface shall be regenerated to display information for the defined mode.)

1. The user interface shall maintain a connection to the webserver and provide synchronous communication.
2. The user interface shall begin with an access/login page to identify the user to the server.
3. The user interface shall be tailored as follows for the Student, Instructor, or Admin environments:

a. The student environment shall make available a COLR'd reading mode.

b. The student environment shall make available a Slashed Paragraph reading mode.

c. The student environment shall make available a Slash Stream Player reading mode.

d. The student environment shall provide a means to access assigned readings.

e. The instructor environment shall include all student environment features.

f. The instructor environment shall make available a corrections mode.

g. The instructor environment shall make available an account generation mode.

h. The instructor environment shall make available and add reading sample mode.

i. The instructor environment corrections mode shall allow editing the part of speech coloring.

j. The instructor environment corrections mode shall allow editing of the slash positions.

k. The admin environment shall allow the creation of new instructor account.

l. The admin environment shall include a server status mode displaying a compendium of details.

m.The server status mode shall include: free disk space, free memory resources, and number of connections. The user interface shall be tailored as follows for the Student, Instructor, or Admin environments:

i. The COLR'd reading mode shall accept an input stream from the server

ii. The COLR'd reading mode shall display the text as color coded by part of speech.

**3.1.2 Single Page Application HTML Shell.**

SPA used to avoid installation of additional software by user and dynamic generation of the page view – the following functional requirements must be met:

1. The Single Page Application HTML Shell shall provide the capability to display the text requested in content table.

2.  The Single Page Application HTML Shell shall provide the navigation through website via navigation bar.

3.  The Single Page Application HTML Shell shall contains website design background as well as CLASH prototype logo.

**3.1.3 SPA Shell JavaScript Functions.**

1. Color Text. Shall perform a particular task put it inside a script element anywhere inside an HTML document or with a .js extension

2. Input document. System shall accept text via pasting document into text box.

3. Save text. System shall be able to save a parsed document after all edits have been made.

4. Retrieve Document Function. Retrieves document indicated, based on selection, by the user (Administrator/ Instructor/Student). This function is responsible for the following:

a. The functionality to retrieve a document stored in the database.

5. Display Document Function. Retrieves document indicated, based on selection, by the user (Administrator/ Instructor/Student). This function is responsible for the following:

b. The functionality of displaying the XML file retrieved from the server via supported browser.

6. Change Modules: System shall change module/functionality based on mode selected.

**3.1.4 Database**.

Database access is needed if the end user is to actually use the program. The user shall need to:

1. Document Storage This function shall provide the user to store recently parsed documents and to retrieve previously stored documents
   1. Retrieval. This function shall provide the user to store recently parsed documents and to retrieve previously stored documents.
   2. Retrieve All. This function shall retrieve all documents available to the user based on their permissions.
   3. Retrieve Document. This function shall retrieve a document to be displayed by the User Interface.
   4. Retrieve Individual Student Performance Report This function shall return the name, id, and current lexical bundle reading speed of the student requested.
   5. Retrieve Bulk Student Performance Report. This function shall return the name, id, and current lexical bundle reading speed of all the students under the requested professor
   6. Retrieve All Student Performance Reports. This function shall return the name, id, current lexical bundle reading speed, and instructor for all students on the server.
   7. Retrieve Instructor Report. This function shall return the name, id, and a list of all files uploaded by the requested instructor.
   8. Retrieve Instructor Bulk Report. This function shall return the name, id, and a list of all files uploaded by all the instructors on the server.

**3.1.4 User Account Database**  
The User Account Database shall be referenced for all user management and reporting requirements.   
  
1. User Account Database. The User Account Database is to be referenced when a user initially tries to access the system. The UAB will also be referenced when selecting desired documents as student users will only be able to access documents that are assigned to the class the student user is a member of.

a. Administrator user:

i.Create Users. Administrator user shall have the ability to create Administrator, Instructor, and Student Users.  
ii. Delete Users. Administrator user shall have the ability to Delete Administrator, Instructor, and Student Users.  
iii. Modify Users. Administrator user shall have the ability to modify Administrator, Instructor, and Student Users.  
iv. Other abilities. Administrator user shall have the ability to use all functionality afforded to Instructor and Student Users.

b. Instructor user:

i. Add User to Class. Instructor user shall have the ability to add Student Users to a "class" that is represented by a table.  
ii. Remove User from Class. Instructor user shall have the ability to remove Student Users from a "class" that is represented by a table.  
iii. Create Class. Instructor user shall have the ability to create a class to which Students shall be added to limit access to class specific documents.  
iv. Delete Class. Instructor shall have the ability to remove a class if the class is no longer needed.  
v. Extract Data. Instructor shall have the ability to extract data from Student users for reporting purposes.  
vi. Other abilities. Instructor user shall have the ability to use all functionality afforded to Student Users.

c. Student User:

i. Login to the system. Student User shall have the ability to login to the system for purposes of authentication.

**3.1.5 Document Database**

The Document database shall be referenced when users need to access documents for use in the COLR or SLASH modules.

1. Document Database. The Document Database shall be referenced when a user desires to SELECT, INSERT, DELETE, and UPDATE a document

a. Administrator User.

i. Other Abilities. Administrator user shall have the ability to use all functionality afforded to Instructor and Student users.

b. Instructor User.

c. Student User.

3.1.5 User Management

1. User Authentication Function. This shall provide the ability of account creation, management, account login, and password management.

a. User. The system shall allow for user level access. Justin

b. Login. The systems shall allow user to login to the system using a user name and

Password. (Justin)

c. Create PW. The system shall allow the user to create a new password on first login.

d. Create PW. Post Admin Reset. The system shall allow the user to create a new password after a reset by the administrator.

2 System Administrator The system shall allow for system administrator access.ustin

a. Create Accounts The systems hall allow system administrator to create user accounts, including login name, password, and appropriate roles and permissions.

b. Activate/Deactivate. The system shall allow system administrator to activate and deactivate user accounts.

c. Password Req.’s. The system shall allow the system administrator to set regular password reset requirements.

d. Password Creation Rules. The system shall allow the system administrator to create rules/guidelines for password creation (Justin)

3 Class roles

a. Class Authentication. This function shall provide the ability class creation, management, login, and password, CRN.

b. Crate class. The systems shall allow system administrator\ instructor to create new class, including login name, password, class type, and permissions.

c. Activate/Deactivate. The system shall allow system administrator\ instructor to activate and deactivate

**3.2 Performance Requirements**

Describe any performance requirements in this section.

**3.2.1 COLRS Module.**

1. COLR Module. This shall receive the parsed .json file with each word parsed and assigned a part of speech attribute (one of the eight parts of speech (ITF 1.4.1.1)) and change the color of text for each part of speech to an agreed upon color based on the P.O.S. attribute tag in the .json file.

2. COLR Document System. This shall send call to the server to apply the COLR module logic to a document that has been input (ITF 1.1.3). Document shall be parsed and colored using the web interface to interact with the .json file using pre-approved ‘COLR’ logic.

a. Part of Speech System. This shall allow for singular, or multiple parts of speech to be toggled so as to turn the color of all other parts of speech back to black. (Ex. If noun is selected, all nouns shall stay colored, and other parts of speech shall be black.)

Parts of Speech:

• Noun

• Pronoun

• Verb

• Adjective

• Adverb

• Preposition

• Conjunction

• Interjection Test each part of speech to ensure that no others are shown.

3. COLR Edit The system shall allow for text to be right clicked and label for part of speech assigned to be changed. This edit shall change the P.O.S. attribute of the .json object. Drop down menu shall allow access to a list of parts of speech to change the assignment/color of a particular word.

a. Single Page Application HTML Shell shall interact with node.js and the database in order to provide a user interface that is easy to navigate and intuitive in use. It shall allow the user to interact with documents without refreshing the page to change between modules.

i. Text box module shall provide an area for the user to paste in text to be parsed. This module shall act both as an area for text to be input, and displayed/edited.

1. The text box shall provide an area for the instructor to paste text.

2. The text box shall provide an area to display text that has been parsed and then either COLR'd or SLASHED.

a. The text box shall provide an area for the user to review the displayed text and edit it by using the right click action on their mouse.

i. The right click action shall bring up a menu depending on placement.

1. If a word is right clicked, the system shall provide a drop down list of parts of speech so the designated attribute of the .json object can be changed.

2. If a space or slash is right clicked, the system shall provide a drop down list containing either a slash or an icon that prompts for the removal of a slash.

**3.3 Assumptions and Constraints**

**3.4 Non-Functional Requirements**

Describe the non-functional requirements that characterize the performance of the product. Examples of these are security, maintainability, and reliability. Place those that are pertinent to your product in this section.

**3.4.1 Runtime Environment requirements for node.js:**

1. Install NPM modules:

a. Jquery. The system shall have Jquery installed for dynamic page actions

b. Morgan. The system shall...

c. Express. The system shall...

d. MySQL API. The system shall...

e. Python/shell. The system shall...

2. Configure server for continuous run. The system shall provide synchronous communication between the client and server so that client page does not need to refresh to view changes in the client state

a. Javascript code for node. The system shall...

b. Linux scripts to launch as daemon. The system shall...

c. NGNIX Server. The system shall...

d. File reconfiguration. The system shall...

e. Node/database. The system shall...

3. User Account Requirements:

**Appendix**

Other functions I could not assign to section!!!!

1.2.3 Slash Edit System shall allow for the ability to right click in order to either:

•Remove a slash that was placed incorrectly.

• Add a slash where one is required but not placed by the ‘SLASH’ algorithm. Slashes will be removed and added at random to a document to test functionality.

1.3 Slash Player System shall allow for ‘SLASH PLAY’ button to be pressed so that previously ‘SLASHED’ document will be displayed in a speed reader type format. Play previously ‘SLASHED’ document back ensuring that thought groups appear in order, with appropriate breaks.

1.3.1Squirt.io IN

1.3.2Squirt.io OUT

1.3.3Slash Playback System shall allow the user to input two commands for Slash Playback:

• Play button – Feedback which provides a display of the text in lexical bundles at the chosen speed.

• Pause button – Feedback which halts the display of lexical bundles. Andrew

1.3.4Slash Playback Variable Speed System shall allow for the slowdown and speed up ‘SLASH PLAY’ as desired to certain word per minutes thresholds. Test at variable speeds and ensure that words per minute are approximately correct.

1.4 COLR Module System shall allow for an input document (ITF 1.1.3) which it will then relay to P.O.S. parser used for the COLR module. Glossary ref. to COLR