



# Senior Project Final Presentation

## Fall 2017

# VIRS 2.0

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# Problem definition

- Problem:
  - One of the major challenges that English Language learners (ELL) as well as mainstream students face is the lack of a reliable source to improve their academic words. There is no easy way to validate the easiness of text, which allows professors to select the appropriate materials for class. A challenging text is a wonderful way to propel students forward, yet something too hard to read can cause the opposite effect.

# Project definition

- An application that produces enhanced texts through a color-coded system.

## Enhanced Text

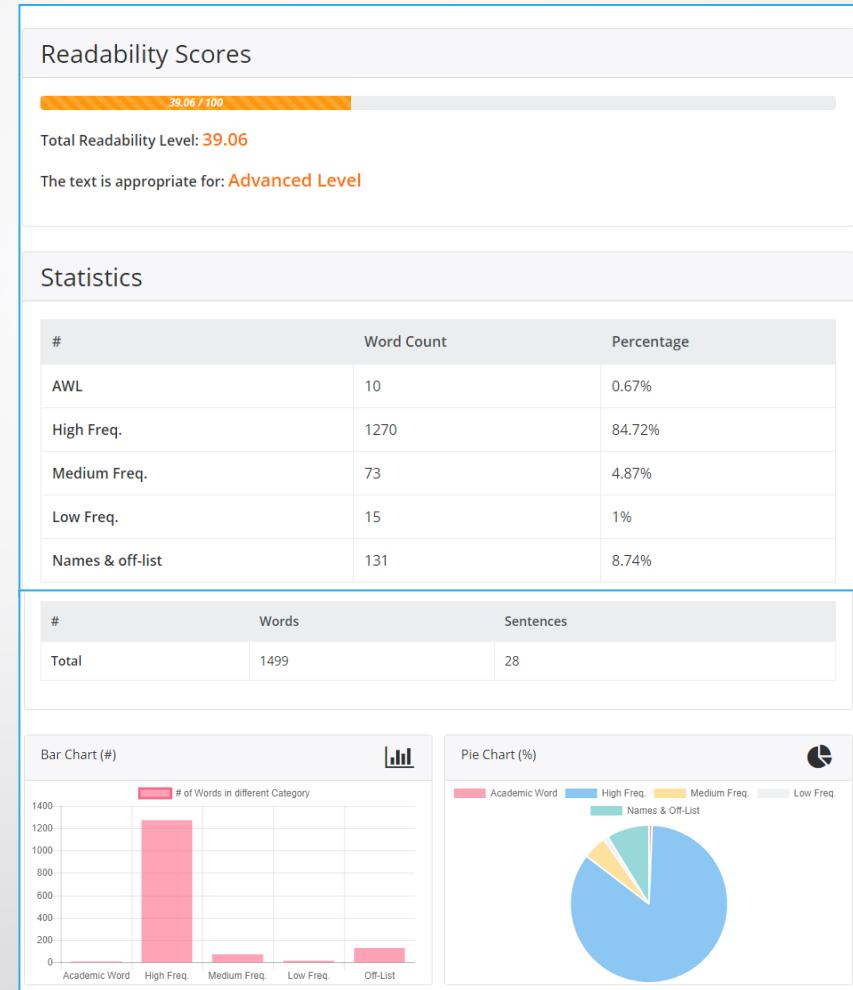
Back Statistics

Academic Word High Frequency Med Frequency Low Frequency Names & Off-List

A wonderful serenity has taken possession of my entire soul, like these sweet mornings of spring which I enjoy with my whole heart. I am alone and feel the charm of existence in this spot, which was created for the bliss of souls like mine. I am so happy, my dear friend, so absorbed in the exquisite sense of mere tranquil existence, that I neglect my talents. I should be incapable of drawing a single stroke at the present moment; and yet I feel that I never was a greater artist than now. When, while the lovely valley teems with vapour around me, and the meridian sun strikes the upper surface of the impenetrable foliage of my trees, and but a few stray gleams steal into the inner sanctuary, I throw myself down among the tall grass by the trickling stream; and, as I lie close to the earth, a thousand unknown plants are noticed by me: when I hear the buzz of the little world among the stalks, and grow familiar with the countless indescribable forms of the insects and flies, then I feel the presence of the Almighty, who formed us in his own image, and the breath of that universal love which bears and sustains us, as it floats around us in an eternity of bliss; and then, my friend, when darkness overspreads my eyes, and heaven and earth seem to dwell in my soul and absorb its power, like the form of a beloved mistress, then I often think with longing, Oh, would I could describe these

# Project definition

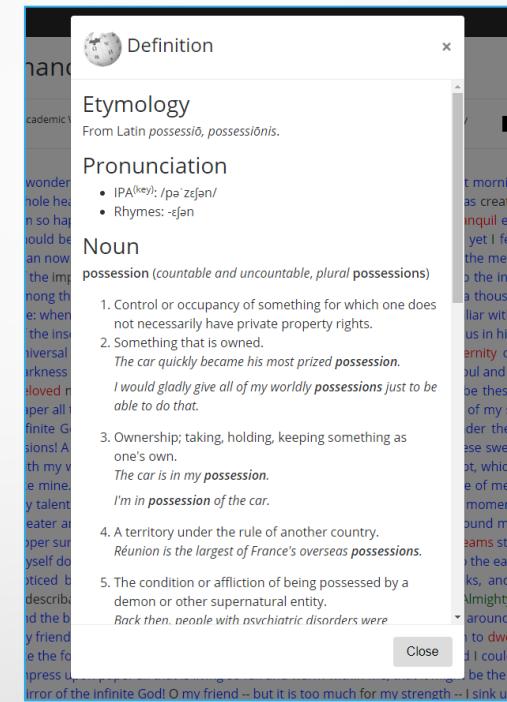
- Provides reliable readability index that would help teachers in decisions making gives a detailed analysis of texts that would help in material development.



# Project definition

- The Wikipedia definition for the word will be displayed when clicking a word.

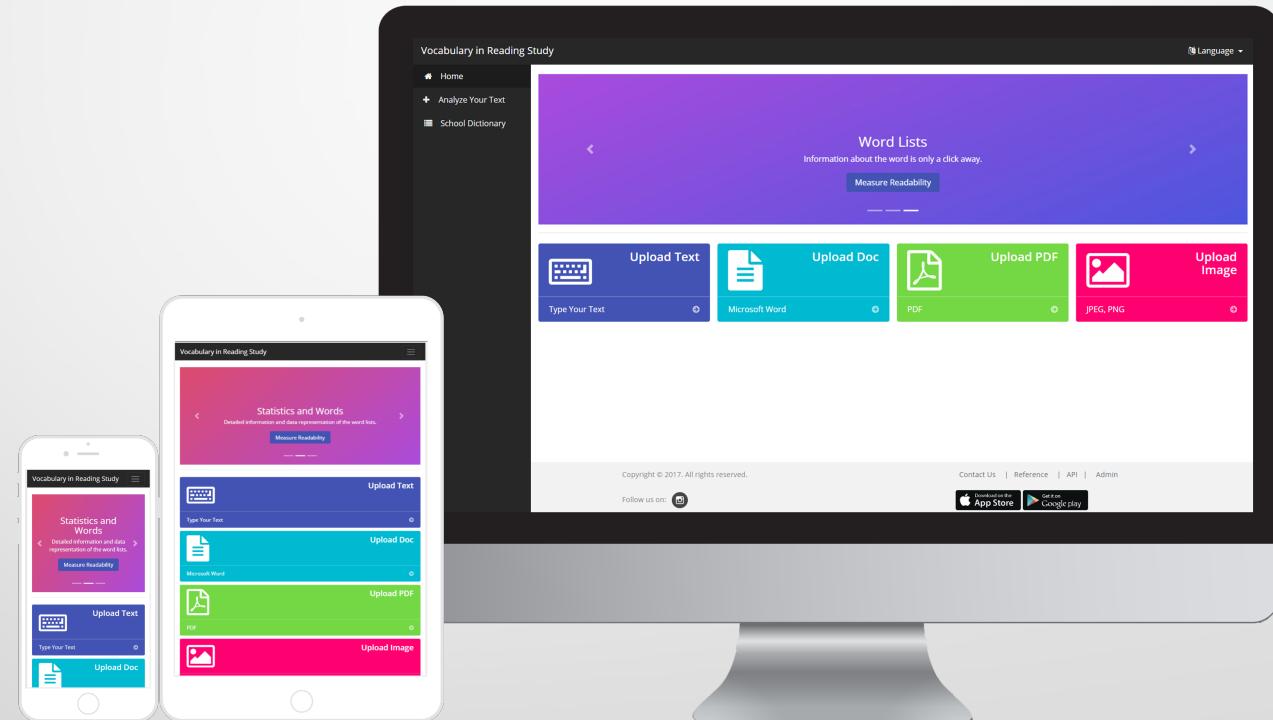
Word	Category
abdomen	Medium Frequency
abdomens	Medium Frequency
abdominal	Medium Frequency
abidance	Medium Frequency
abide	Medium Frequency
abiding	Medium Frequency
abidingly	Medium Frequency
abject	Medium Frequency
abjections	Medium Frequency
aboard	Medium Frequency
abominable	Medium Frequency



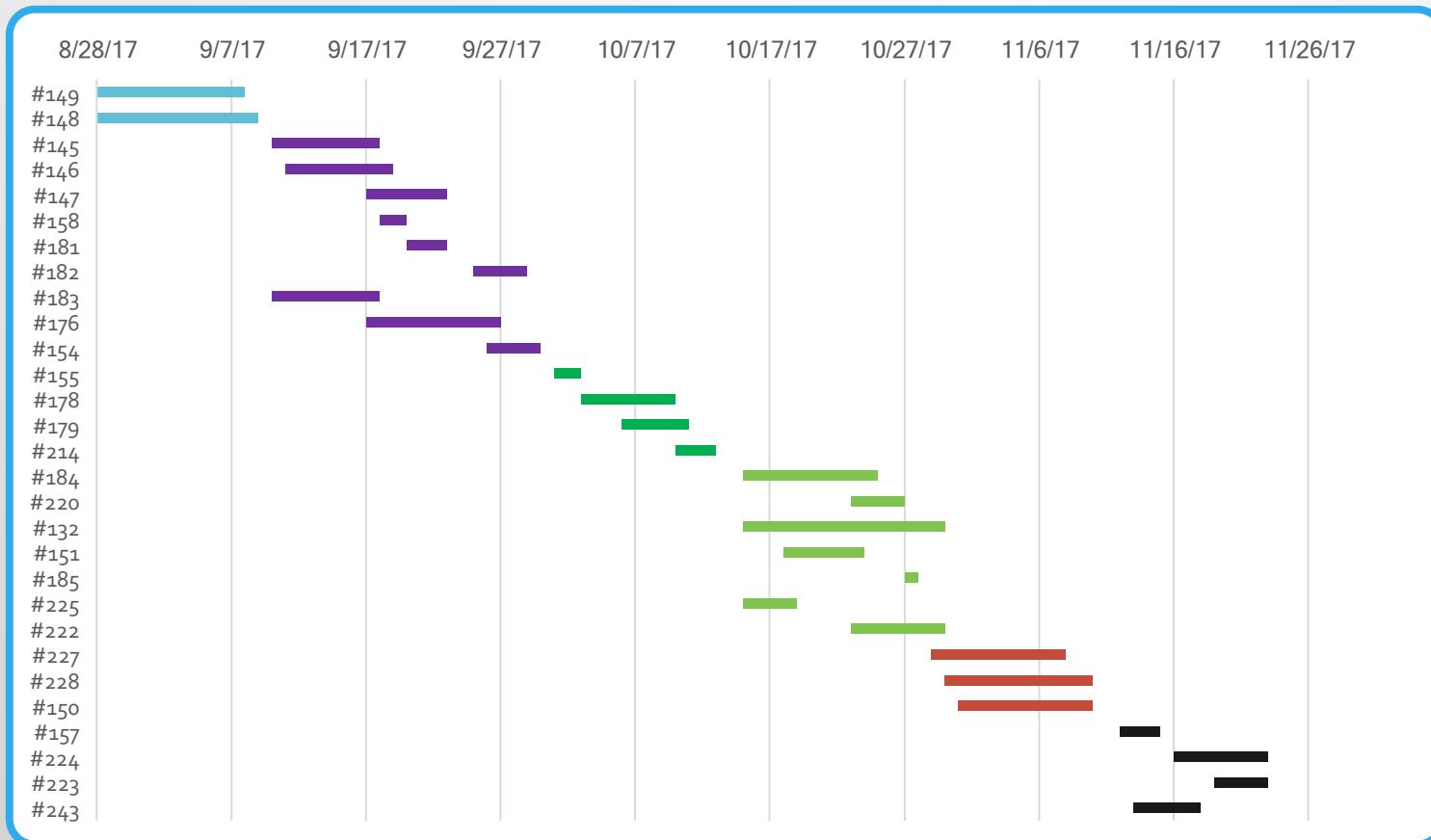
- A new frequency-based dictionary that makes it easier to read.

# Project definition

- The web application that is accessible from desktops, tablets and mobile devices.



# Project Management



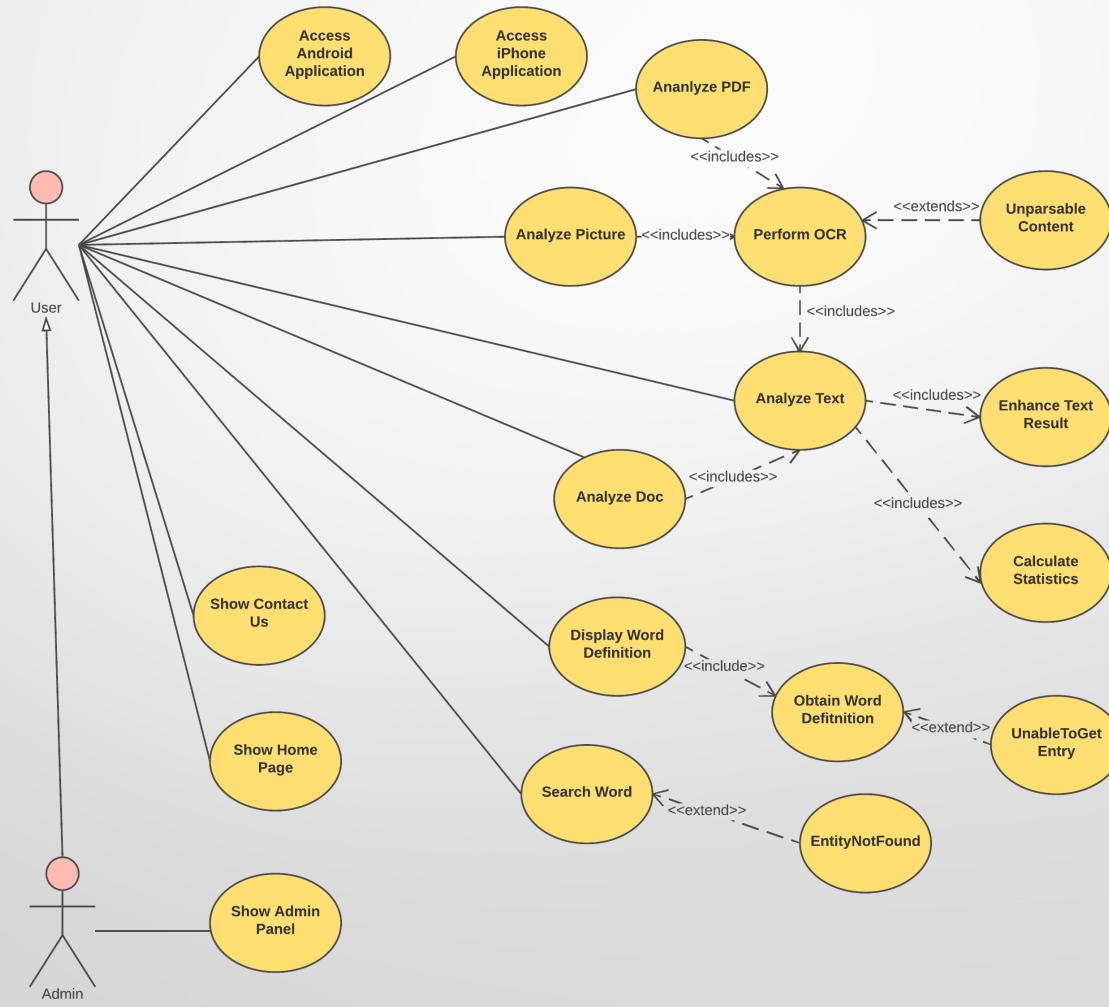
# Requirements: User Stories

- 132 [Backend] Perform OCR
- 145 [Backend] Analyze Text
- 146 [Backend] Analyze PDF
- 147 [Backend] Analyze Doc
- 148 Implement Responsive Design
- 149 Merge Applications
- 150 [Frontend] Create Admin Panel
- 151 [Backend] Implement Word Definition
- 154 [Frontend] Create Sidebar Menu
- 155 [Frontend] Apply Category Color to Words
- 157 Implement Google Analytics
- 158 [Backend] Create Admin Login
- 176 [Frontend] Analyze Text
- 178 [Frontend] Analyze PDF
- 179 [Frontend] Analyze Doc

# Requirements: User Stories

- 181 [Backend] Manage words list
- 182 Create cloud application
- 183 [Frontend] Create page for enhanced
- 184 [Frontend] Create page for statistics
- 185 [Frontend] Create instructions
- 214 [Frontend] Analyze Image
- 220 [Frontend] Create Word Lists page
- 222 [Frontend] Implement Word definition
- 223 [Frontend] Add Credits Page
- 224 [Frontend] Add Contact Us Page
- 225 [Backend] Calculate Statistics
- 227 [iPhone] Create iPhone Application
- 228 [Android] Create Android Application
- 243 Create Search API

# Requirements: Use Cases



# User Story: #132 Perform OCR

- As a user, I want to see the words and their different categories from an image file so that I can know more about the words in the image.

<p><b>Deliverance</b></p> <p>Moonlight, clear as water, I pace the ground under a tree In deep, deep thought. Deep in thought, I pick up a fallen twig To tap, with a sigh, my own shadow On the moonlit ground.</p> <p>Life— Everybody treats it as a dream, A blurred dream. My friend, As you try to find clear lines in the blurred world, Your life's suffering Thus begins!</p> <p>You may treasure life's snow-white robe, Yet life has to cross The immense sea of darkness. My friend, The world does not abandon you, Why should you abandon the world?</p> <p>Let life stand alone and noble like a stork, Free as a cloud, And pure and calm as water, Even if life were a dream, Let it be a clear dream.</p>	<p><b>Deliverance</b></p> <p>Moonlight, clear as water, I pace the ground under a tree In deep, deep thought. Deep in thought, I pick up a fallen twig To tap, with a sigh, my own shadow On the moonlit ground.</p> <p>Life— Everybody treats it as a dream, A blurred dream. My friend, As you try to find clear lines in the blurred world, Your life's suffering Thus begins!</p> <p>You may treasure life's snow-white robe, Yet life has to cross The immense sea of darkness. My friend, The world does not abandon you, Why should you abandon the world?</p> <p>Let life stand alone and noble like a stork, Free as a cloud, And pure and calm as water, Even if life were a dream, Let it be a clear dream.</p>	<p><b>Deliverance</b></p> <p><b>Moonlight, clear as water,</b> <b>I pace the ground under a tree</b> <b>In deep, deep thought.</b> <b>Deep in thought, I pick up a fallen twig</b> <b>To tap, with a sigh, my own shadow</b> <b>On the moonlit ground.</b></p> <p><b>Life—</b> <b>Everybody treats it as a dream,</b> <b>A blurred dream.</b> <b>My friend,</b> <b>As you try to find clear lines in the blurred world,</b> <b>Your life's suffering</b> <b>Thus begins!</b></p> <p><b>You may treasure life's snow-white robe,</b> <b>Yet life has to cross</b> <b>The immense sea of darkness.</b> <b>My friend,</b> <b>The world does not abandon you,</b> <b>Why should you abandon the world?</b></p> <p><b>Let life stand alone and noble like a stork,</b> <b>Free as a cloud,</b> <b>And pure and calm as water,</b> <b>Even if life were a dream,</b> <b>Let it be a clear dream.</b></p>
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# Use Case: #132 Perform OCR

**Name:** Perform OCR

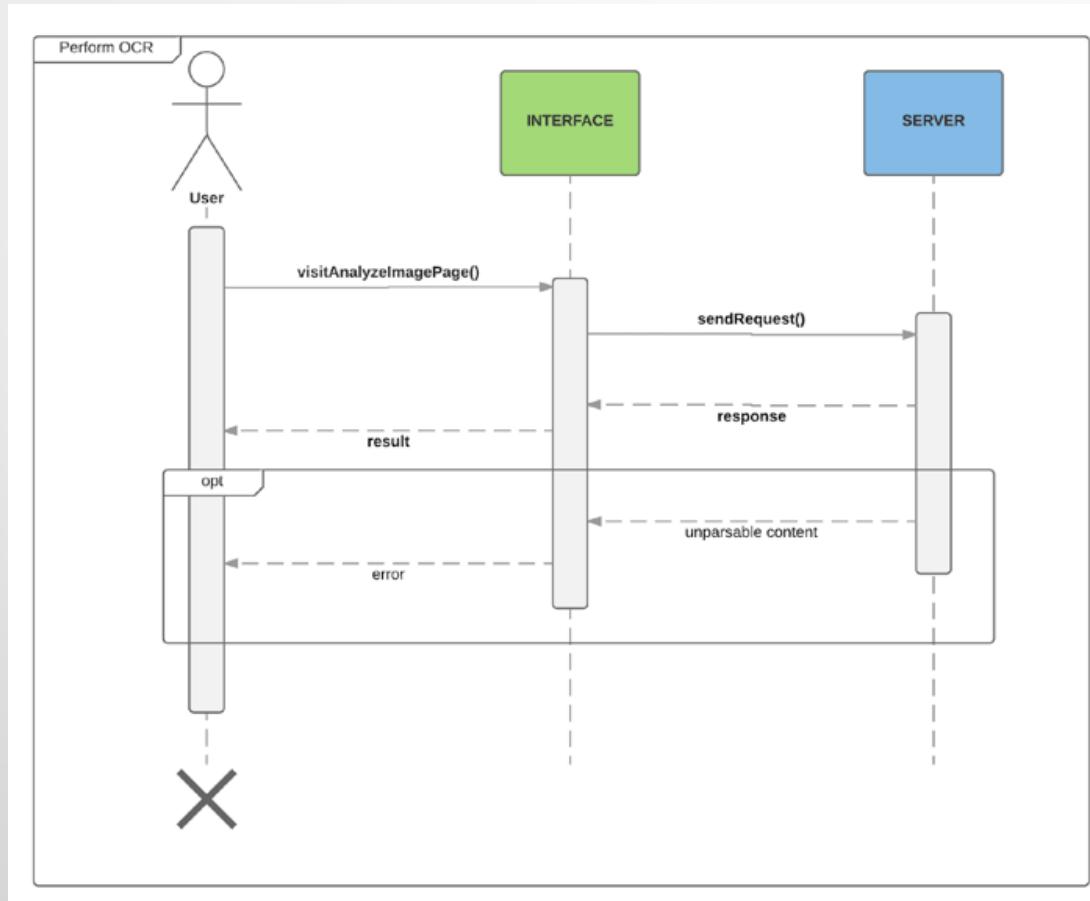
**Actor:** User

**Preconditions:** The user has the desire to know more information about words in a picture.

**Description <Flow of events>:**

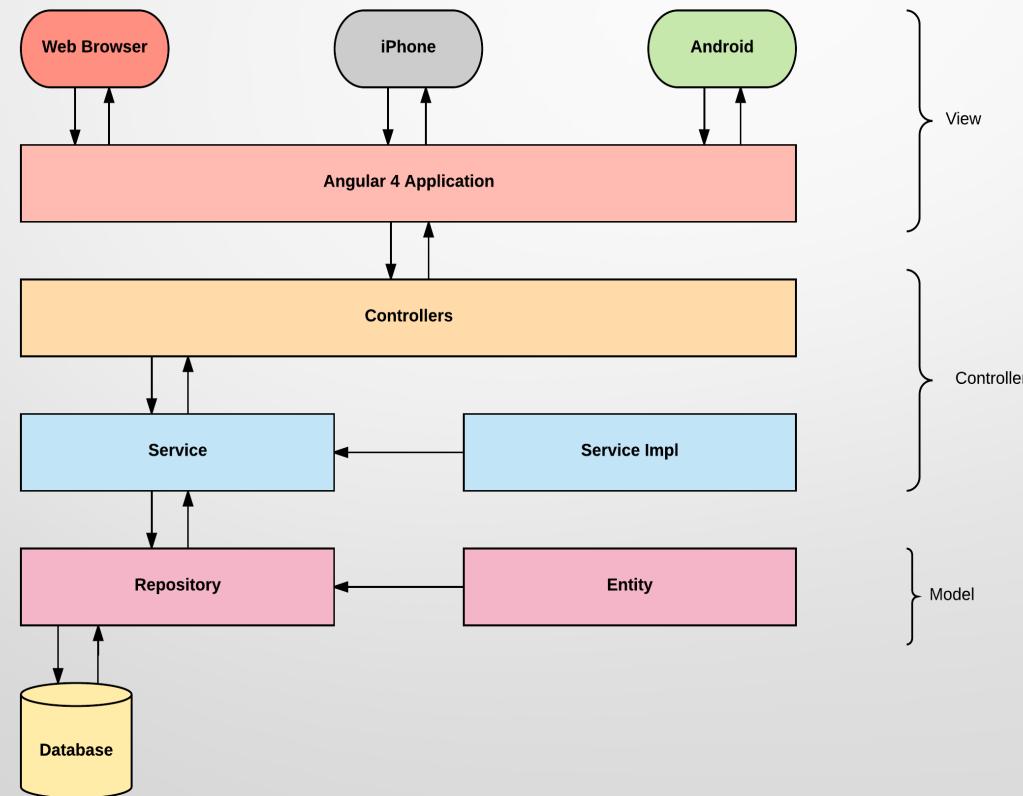
- The user interacts with systems and chooses a picture
- The user sends the information
  - The system receives the information and process it
- The system displays the information.
- The use case ends
- Alternative: The user receives an unparsable exception.

# Requirements: Sequence Diagrams

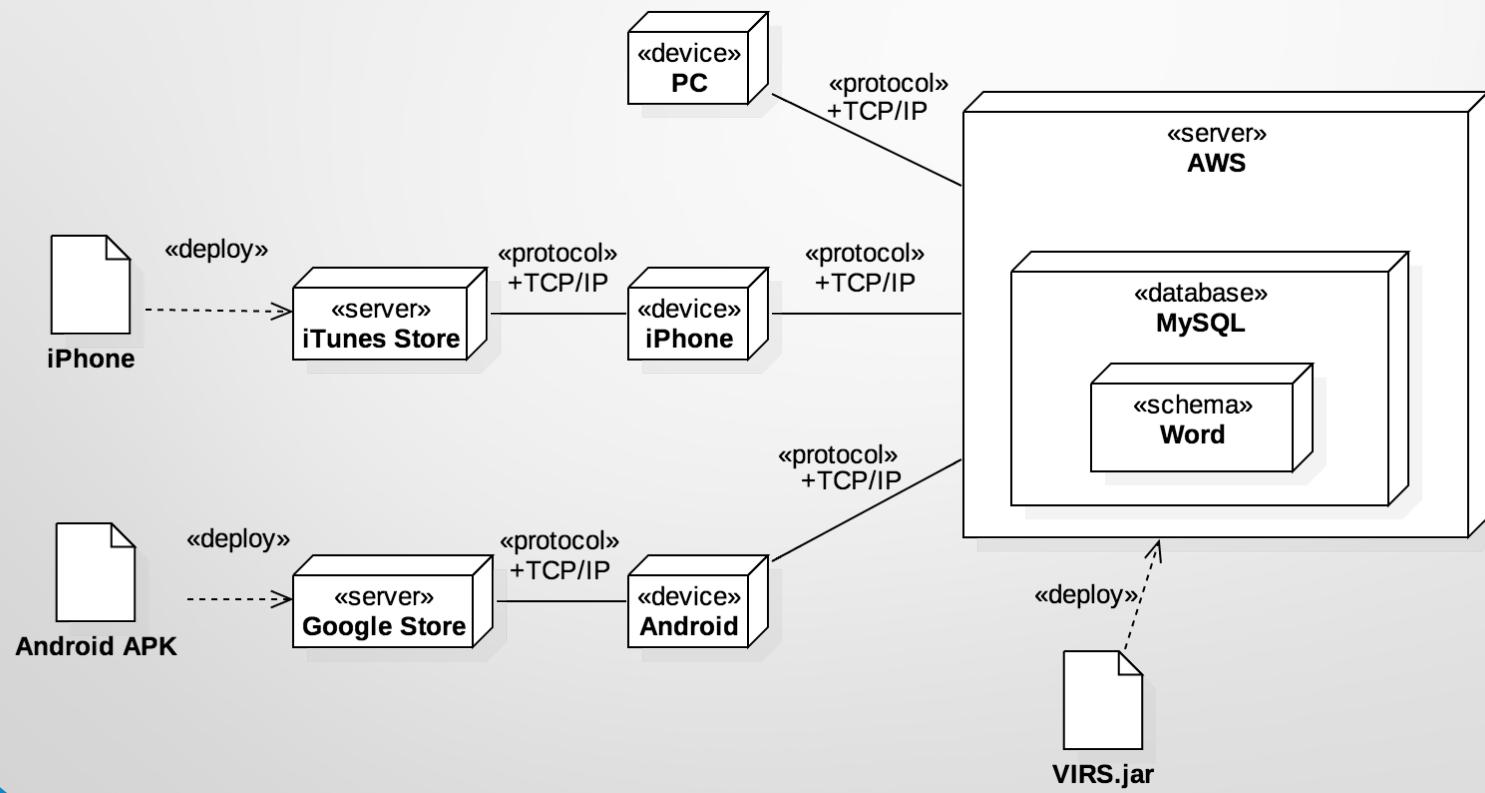


# System Design: Architecture

## Model-View-Controller



# System Design: Deployment



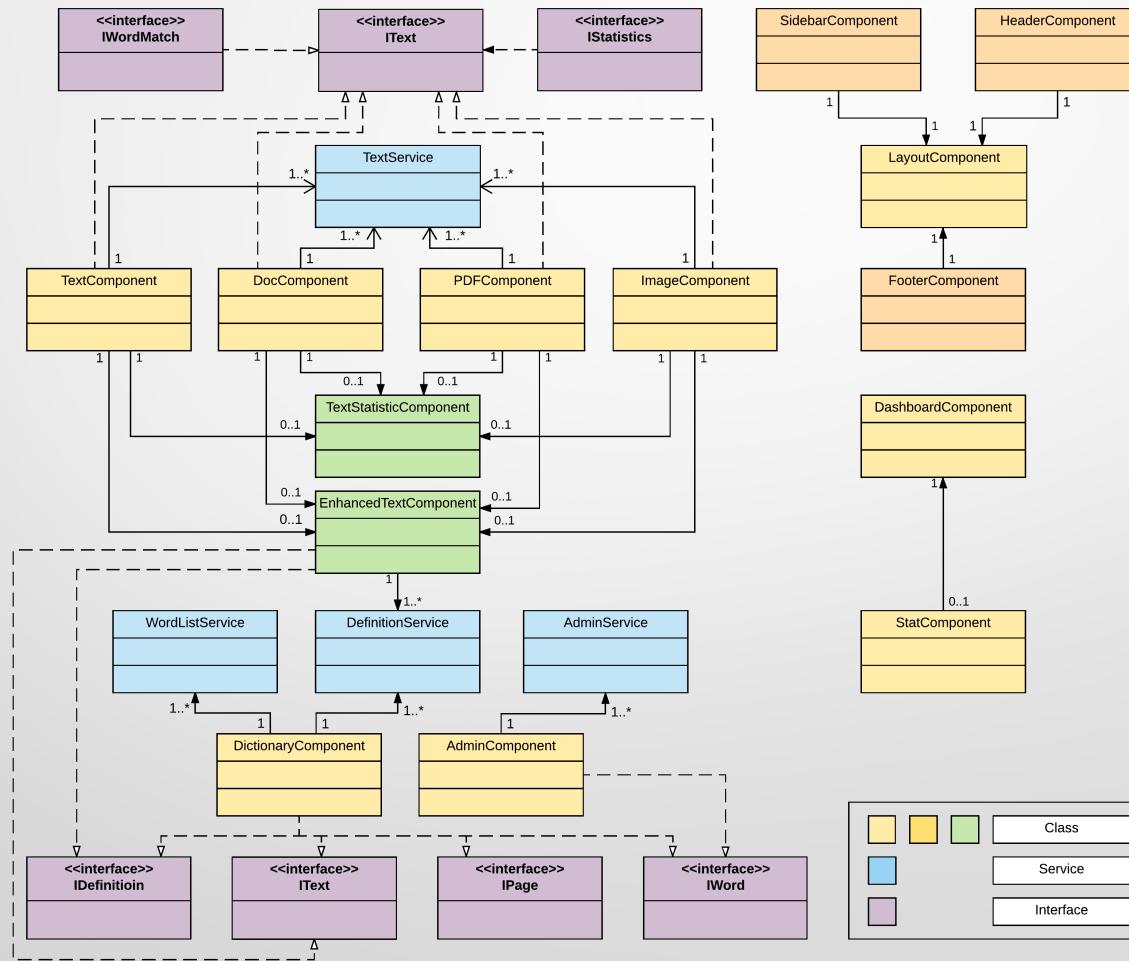
# System Design

- Persistent data design
  - The data layer consists in a single table with all the data.

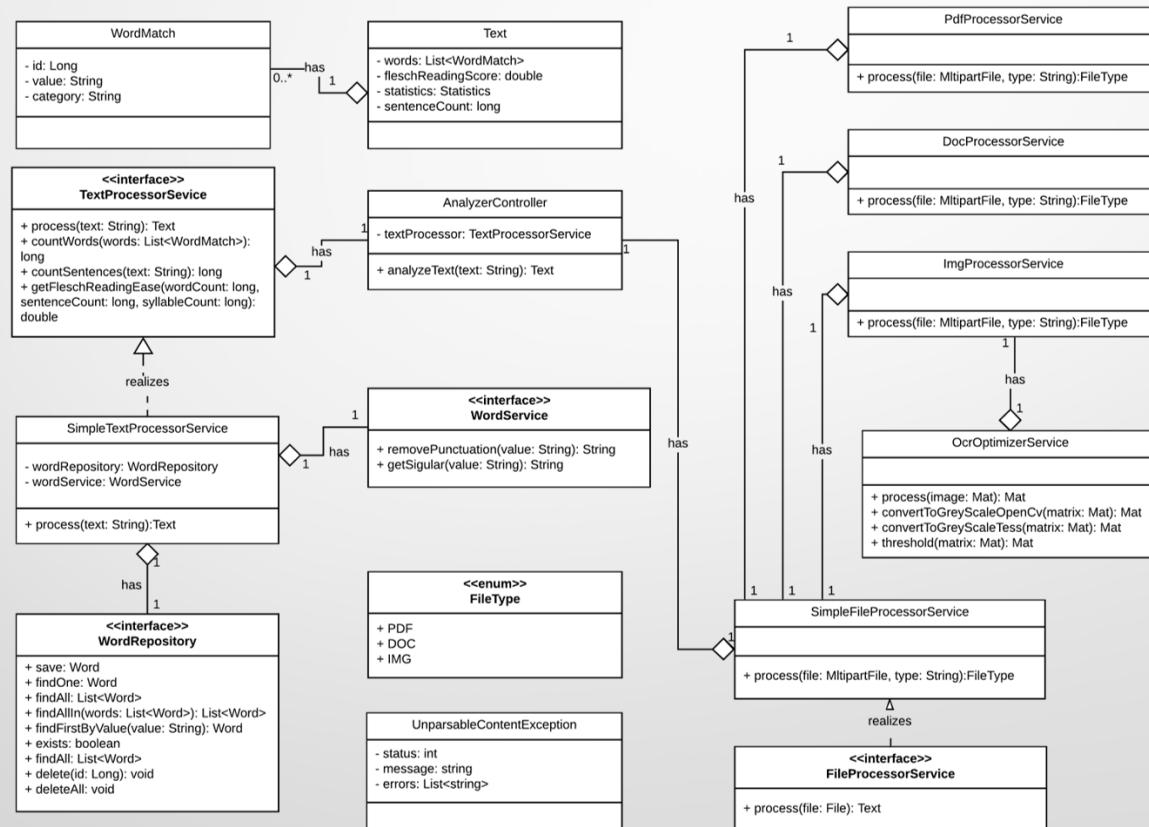
Word		
Key	id	value
		category

- Security/Privacy
  - All keys are encrypted using Jasypt.
  - The Administrator keys are all secured.

# Minimal Class Diagram: Frontend



# Minimal Class Diagram: Backend



# Main algorithm

```
List<Word> words;  
Map<String, Word> resultMap;
```

**FOR EACH** word **IN** text.words

    Word cleanWord = clean(word);

**IF** (resultMap.contains(lemma)) **THEN**

        words.add(word)

**ELSE**

        word found = wordRepository.find(word);

        resultMap.put(word, found);

        words.add(found)

**END IF**

**NEXT**

# Test Suites and Test Cases

- Junit was the main tool utilized to verify the system.
- Implemented several integration tests that are run before deploying to the web.
- Karma and Jasmine were used to perform unit testing for frontend.
- Compodoc and Istanbul were used to generate a code coverage report.

# Test Suites and Test Cases

- **Test case ID:** getFleschReadingEase\_WithDataFromWebSite\_Returns60\_20
- Description/Summary of Test: Getting the Flesch Reading Score with word count of 300, a sentence count of 12 and a syllable count of 430 returns 60.20.
- Pre-condition: None
- Expected Results: A reading score of 60.20
- Actual Result: A Reading score of 60.20
- Status (Fail/Pass): Pass

# Test Suites and Test Cases

- Test case ID: TextComponent\_ShouldCreate\_001
- Description/Summary of Test: The Text component should be created.
- Pre-condition: The server must be running.
- Expected Results: Test Component should be created
- Actual Result: Test Component was created
- Status (Fail/Pass): Pass

# Summary

- Summary:
  - VIRS is a web app which facilitates learning of new languages through analysis of text and gathering of data which is then displayed to the user. Data given to the user includes category of word as far as popularity and definition of the words in the text with respect to the information in the database. It also provides the user with a complete statistical text analysis report and readability score.
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- Questions?
- Thank You!

