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**Title:** **WORDS IN ACTION**

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# Words in Action

## 1.INTRODUCTION

If picture tells a thousand words than animation tells a million, nowadays animation is the most effective and attractive way to make anything understandable, to someone, and to entertain. Also the visual modalities are one of the most important modalities in any multimedia presentation. Making someone understand a scenario or to give group of people a same view through language is quite a difficult task, because the way of thinking varies from person to person. So each individual would think in a different way. And here animation plays an important role apart from entertaining.

Moreover, in recent years, due to digital revolution the paradigm of world is shifting towards automation and everything from watches to complex machines are being automated. But nowhere have we seen the automation of the animation which is quite an interesting and significant thing for the society which is preferring animation in each and every prospective of life.

So, the core idea of the project, “Words in Action”, is to automatically convert the natural language into animation. A desktop application that would help the people to visualize the written scripts and scenario to have a clear image of what is written.

## **2. PROJECT VISION**

### **2.1 Problem statement**

Animations plays a vital role as far as giving instruction, making something visualize and grapping the attention of someone is concern. And is an interesting way to do so. Albeit, according to the research, making animation is a difficult task and is not doable for every lay man. To do so one should make the decisions that result in effective graphics, and this requires expertise in visual design with significant effort and time, all of which are indispensable for traditional 3D animation authoring. However, effort and time could be spared by using automated knowledge-based design of 3D animations. That make animation automatically from the script or any type of natural language.

So, by converting the natural language into animation would give a way to make animation by typing different types of scripts. And any lay man without having the knowledge of designing and graphics can play with animation and express their feelings through animation.

### **2.2 Objectives**

The main objectives of this project are as follow

- Parsing the script into sentences.
- Handling complex sentences:
  - Breakdown of sentences into simple subject-verb-object format to easily map one simple action to animation
- To train a model for extraction of semantic actions from the given scripts.
- Giving sequence to the extracted actions.
- Mapping the action on the character.
- Generating the animation using unity.

## **2.3 Project Scope**

The project “Words in Action” is a desktop application that can generate animation from the natural language automatically. Given a limited description about any scenario the application would make the animation accordingly and would try to visualize the scene.

Since we can manage only a limited type of animations, set of actions, so it puts a restriction on the type of scripts. The project is towards animating the house robbery stories. Only the stories having the description of house robbery would be converted into animations. Armed house robbery is the main concern of this project.

Moreover, the project would deal with the actions of humans only and not the birds and animals and neither their character are to be shown.

For the time being, the project team will work on making a desktop application as the target platform since it is the most widely used. And the natural language that would be converted to animation would be English.

After construction of simple pipeline, which generates simple sentences to simple animations, we can add more animation clips and script parsing models to generate animations of other fields like jungle, animals, and birds etc.

## **2.4 Business Opportunity**

Automatically generating the animation from the natural language is an interesting and new field. And so has benefits for an enormous market.

As this project deals with making the animation of the house robbery scene so the customers can be the news channels. Every news channel always try to attract more and more people with different strategies. And now they always try to show animation of the news which they are unable to capture like robbery scene. So, now a days many of the

news channels are shifting towards animation. And why don't they, when everyone prefers animation over written scripts and even reading them.

Albeit, making animation is a longer process and so is an issue for the news channels because they have to cast the news at their earliest. So, this project would provide animation at the very next moment as the user enters the scenario. And would not only add colors to their news but also make the audience more conscious and careful about these incidents as they would be watching what had happened. Moreover, these types of projects always play an important role in reducing the expenses.

Other than that, this project could be used by any student to test one creativity, having a scenario of robbery one has to write a story.

## **2.5 Constraints**

### ***Time***

Since this is Final Year Project, the project has to be completed within the timeframe of 2 semesters i.e. Fall 2019 and Spring 2020.

### ***Desktop Application***

This is the biggest constraint in this project, but it is required since we want to create a desktop application because the work of generating animation is always done on the personal computers.

### ***Story length***

The number of words must be in range 50-60 (Mini saga).

### ***Animation length***

As the project has to deal with Natural Language Processing (NLP) models and also the animation so to complete the project in the given time the input/output is kept smaller

and so will generates short length animation, but is an advantage for news channels as they always needed short animations.

## 2.6 Stakeholders Description

### 2.6.1 Stakeholder Summary

Stakeholder Name	Description	Responsibilities
News channels	The news channels will use the project in casting their news to attract audience.	To take benefit from this product and incorporate it into their ecosystem
Development Team	The team of students working on this project: Hamza Tariq, Irfan Ulla and Shan Akbar	To work on project requirements, design, development, documentation, & testing
Dr. Omer Baig	The project supervisor	To provide development team guidance in project management and technical problem solving

### 2.6.2 Problems of Stakeholders

Stakeholder Name	Problems	Goals
News channels	They do not have a way to cast their news of house robbery scenarios with animations. And if some has, it took a lot more time to make animation that become unworthy	Can cast there news with animation at their earliest
Development Team	The team wants to solve a real world problem by leveraging the available tools and technologies	To work on project requirements analysis, design, development, documentation, and testing
Project Supervisor	-----	To provide development team with guidance in project management and technical problem solving; To assess the progress of development team

## 3. Software Requirements Specifications

### 3.1 List of Features

The main features that our application will provide to users are as follows:

- Enter the input (scenario)
- Animated video related to text



## 3.2 Functional Requirements

The Functional Requirements that our project contains are as follows:

- The user should be able to give input the text.
- The system should be able to extract the actions from the text.
- The user should be able to view the generated video.
- The user should be able to view a list of previously generated animations.
- The user should be able to select and run the previously generated animations.

## 3.3 Quality Attributes

### ***Accuracy:***

The application will extract the actions precisely from the text accurately and more precisely.

### ***Performance:***

The application will generate the animation within 2 mins after entering the text.

### ***Usability:***

The application will be simple and easy to use. Any type of user can easily understand and use the application.

### ***Reusability:***

The methods used in the application can be used in future for other purposes for instance, animation pipeline can be increased by adding mammal's characters.

### 3.4 Non-Functional Requirements

- The system should use a limited amount of memory in computer.
- The graphics of animation should be reasonable.
- The system should not crash in case of conditions violations.

## 4. High Level Use cases

### i. UC1)

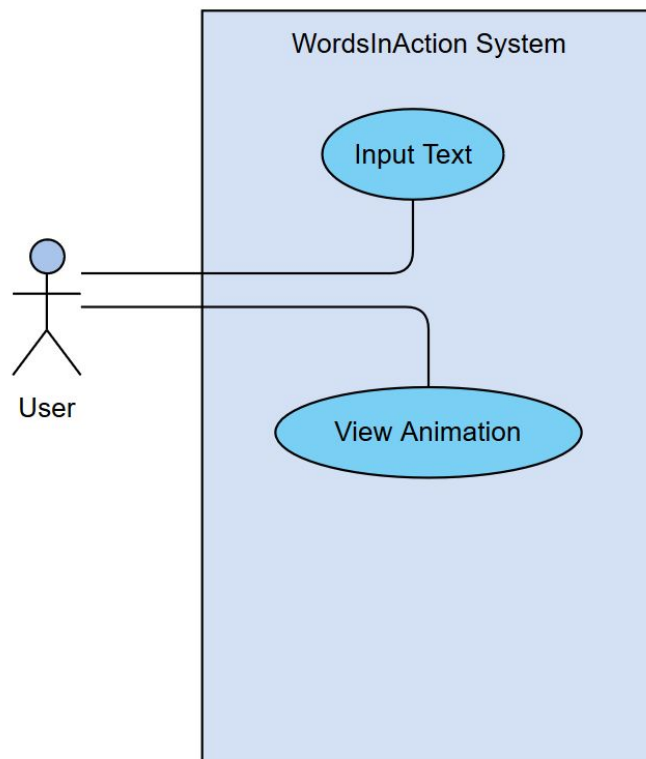
**Use Case Name:** Text Input

**Actor:** User

**Type:** Primary

**Description:** This module will take text as an input from the user. User will be able to write text which user wants to be converted to animation.

## 4.1. Use Case Diagram



## 5. Iteration I

### 5.1. Expanded Use Case

#### *i. UC1) Text input*

**Scope:** Words In Action

**Level:** User Level

**Primary Actor:** User

**Pre-Condition:** User should have select new Animation

**Post-Condition:**

- The system extract the actions from the text
- The system maps the actions onto animations

**Stakeholders and Interests:**

**User:**

- Wants user-friendly interface.
- User wants to view animation of text in less time.

**Success Scenario:**

Actor Action	System Responsibility
	1) System opens a window with text editable in it.
2)User enters the text in window and presses the enter key.	3) System processes the data and returns the animation.

**Extensions:**

- a. System fails to process on the text .
  1. An error message is displayed to let the user know of failure

2. The system gives suggestions (e.g. the length of the story should be less than 50 words)

3. User acts as per the suggestions.

4. System again take text as input.

i. The system is successful in processing the text

1. Model extract the actions.

2. System generates the animation.

ii. The system is unsuccessful in processing the text.

1. Error message is displayed.

2. The user is asked whether to perform the task again or quit the system.

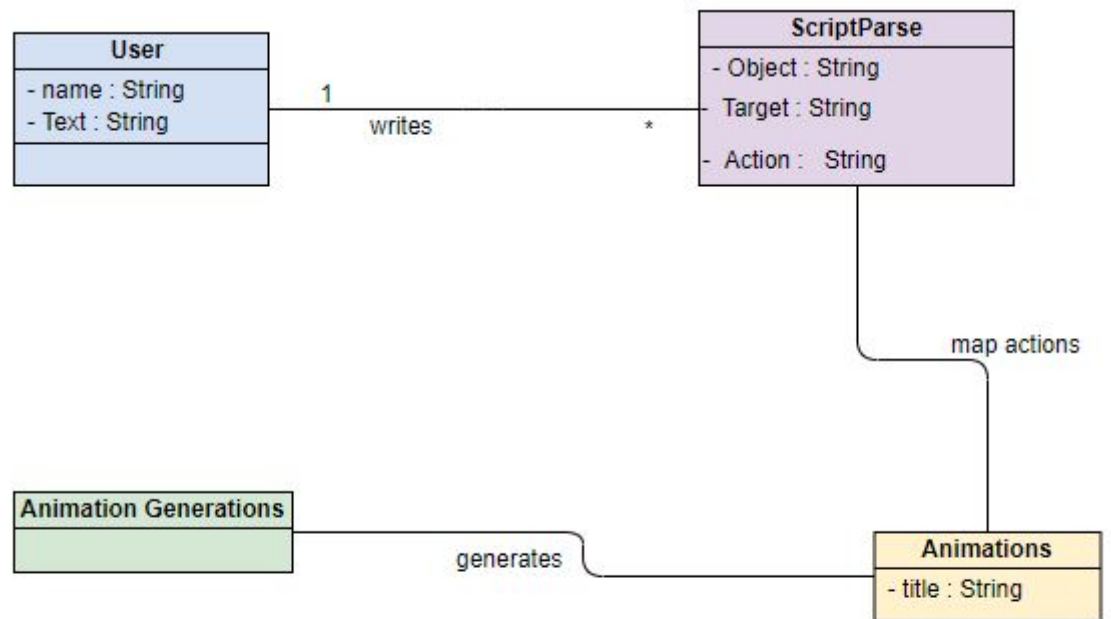
#### **Specific Requirements:**

- a. The font size and the style of should be user-friendly.
- b. The system should be able to handle the wrong input or it should display an error on wrong input.
- c. The system should be able to detect the characters and their roles correctly.
- d. The system should integrate correctly the animation and text.

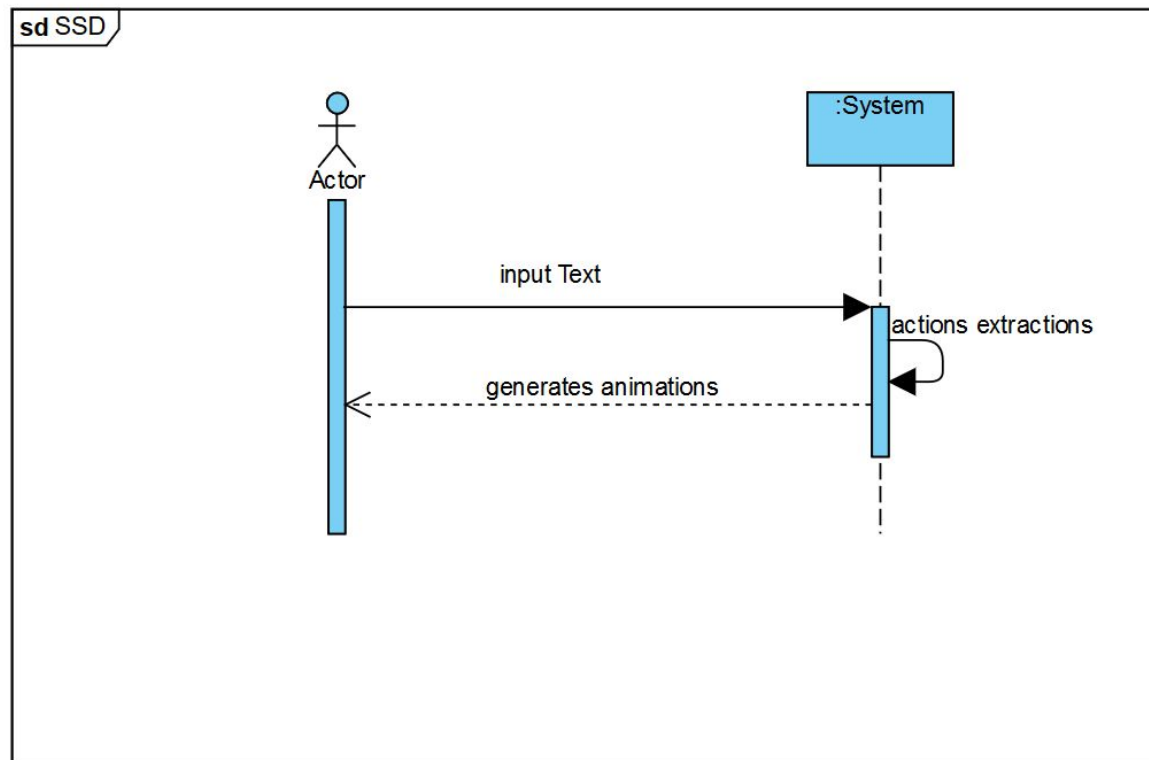
#### **Frequency of Occurrence:**

Whenever user wants animation of the text.

## 5.2. Domain Model



### 5.3. System Sequence Diagram



## 5.4. Operation Contarts

Name : Input Text (String )

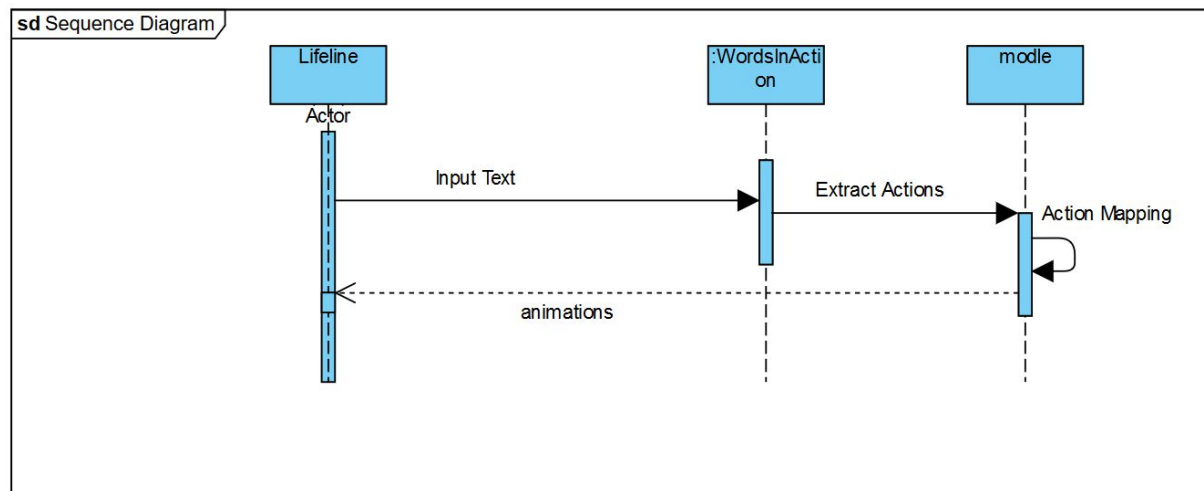
Responsibility: To check either the text is according to conditions

Type : System

Pre-Condition:

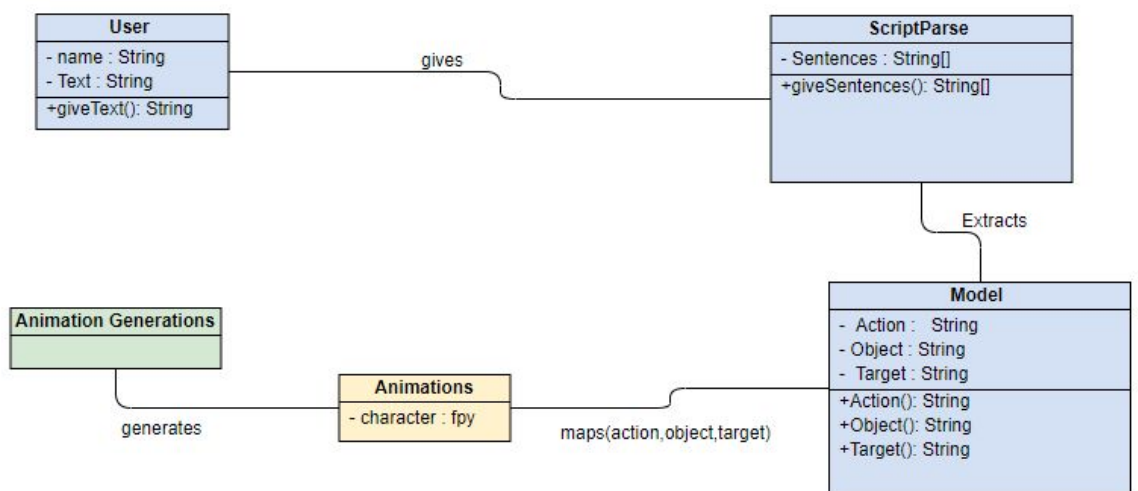
- Extract the actions from the text.
- Generates the animation

## 5.5. Sequence Diagram





## 5.6. Class Diagram



## 5.7. Architecture Design

