# Nature Reserves Tourism System in Egypt Using Gis Case study

by

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# Abstract

Tourism is very important Topic for the economy of Egypt. It contains many tourist attractions sites. Improving tourism in Egypt would have great revenue on the economy. Our project main purpose is to create a tourism system in which it uses Geoinformation with certain tools (ex. Arch GIS 10.7) which will greatly improve tourism sector in Egypt. This project aims to exhibit the application of Geoinformation as a tool for improving the tourism sector by identifying the location of tourist facilities, Services and wildlife habitat locations in order to demonstrate them in a map so that tourists are well informed and directed in what to see and where to go.

## Acknowledgments

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# Chapter 1

# Introduction

### 1.0.1 Background

Tourism has diverse definitions. Tourism is defined by the globe Tourism Organization because the act of traveling for the aim of recreation and also the provision of services for this act. It further explains that a tourist is someone who travels a minimum of eighty kilometers from home for the aim of recreation[1]. Therefore, tourism can be said to be the activities of people traveling to stay in places outside their usual environment for less than 1 year for business and other purposes associated with the exercise of an activity remunerated from within the place visited The tourist destination is a geographical unit. How important any geographical unit is as a tourist destination or how important it is potentially; is determined by three [12]prime factors which constitute the tourism product. It comprises of the perceived and actual attractions of a place, the facilities and the destination's accessibility National Parks and Reserves are distinctive public lands or water bodies within a country which are set aside by the government to protect ecosystems, plant and animal species, scenic landscapes, geologic formations, historical or archaeological sites and such.[5]

### 1.0.2 Motivation

Our motivation for this project was to help clients and tourist to have the best experience in Egypt. Parks in Egypt did not have importance in the past but with everyday technological advancement and the change in the Egyptian economic structure, the government is trying to have good attraction sites inorder to increase its income gained from tourism.

From our 129 responses
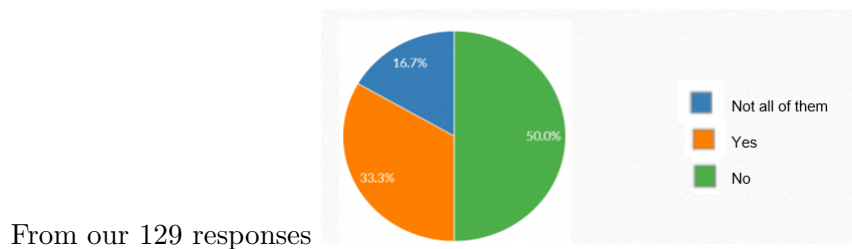
Figure 1.1: survey

### 1.0.3 Problem Definitions

The tourism business in Egypt is endangered by a number of challenges that comprise into; First of all, difficulties in upgrading current interactive tourist guides and maps (expensive and time consuming), lack of digital data for tourism destinations, lack of overall web-based information and unqualified state tourism research, and ineffective and insufficient st ate promotion and lack of technology-driven state tourism approach.

## 1.1 Project Description

Increase the accuracy of Identifying locations suitable to tourists based on detailed information Generate RATING AUTOMATICALLY to give best decision.

### 1.1.1 Objective

The main objective of this study is to create a digital map of all National Park with information on the available parks facilities Based on Ranking system which allow you to know feedback about the park,Moreover The application allow you to give the best route with the kind of transportation[1].All this information help to give you decision about the park you want to visit.we carry out a user needs assessment. To collect relevant data for digital map creation. To map tourist sites and park facilities. To create a geodatabase for all National Parks in Egypt.[4]

### 1.1.2 Scope

- The system will make map of national park in egypt using gis
- The system increase the accuracy of Identifying locations suitable
- The system gives Detailed information about the park
- Tourist can give rate about the service of park
- The system will show detailed ranking about park

### 1.1.3 Project Overview

Our Project help the tourist to choose the right park . The Tourist/Hotel reception will be able to use Pc or Mobile to choose the right park be show him detailed information about the park the rating of the park based on ranking of previous tourists .the system
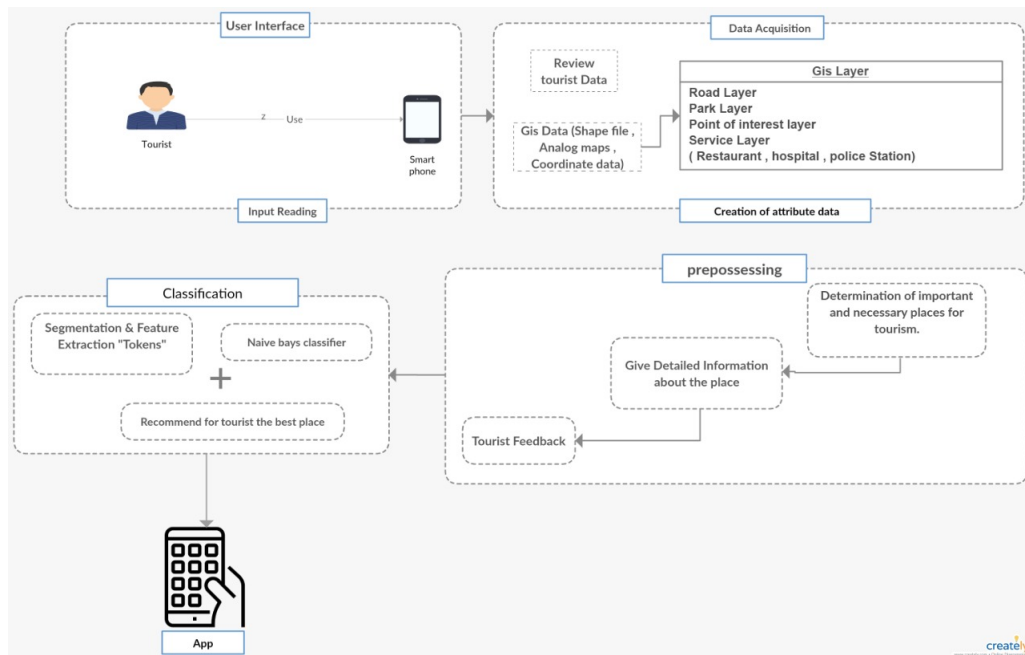
Figure 1.2: System Overview

will help the tourist to give rank about his visit to the park to give detailed information about the park to increase information about the park .the system will help the tourist to take the best decision about the place  the way of transportation to take based on shortest pass sound.

## 1.2   Similar System Information

- In Safe Road Project they used mobile phones that it will help them in speed and flexibility. They face a problem every day that they suffer daily accident because of damaged road maintenances on it.[10] It also help users to find services of ambulance, fuel station, rest on the road easily. Also the user can notify other users with the current state of road. So the Application will make a reports about new services on the roads and these data stored on their database and they will make processing on it. So they can get a useful information and put it on the map. The technology that used in this Application is a native cross platform "Flutter" to build this application on Android and on IOS by using only one code.

- They used geographic information system on their project. They import data that collected from users on ArcGIS that they look if these accident repeated many times in the same period of time they will use algorithm that used to calculate all of inputs to create an output of the application. They used Flutter because this language can compile both ahead-of-time and just-in-time. Flutter uses Skia as a graphics engine that[10] did al UI rendering. They used Google Fuchsia, Dart programming language that it compiled in three ways first compiled as java Script and Stand alone and head of time compiled. They also used Python as a programming language. They also used Android studio, Google maps, Microsoft Visio, ArcGIS as a Platform tools. And there are challenges they face for example when they was working on a framework over a certain time a new update was down and the package they was working on stop support another problems they faced with their team members that they are inexperienced members.

- There is a project has been made by a team in university of Nairobi their case study was AMBOSELI NATIONAAL PARK that demonstrates the importance of Geoinformation.A topographic map and other records from KWS had been used in this study to create a digital geodatabase map of the Park the usage of GIS software. Features had been digitized at the scanned map and other statistics in shape of shapefiles added as overlays. An attribute table was created to link the spatial data with their characteristics in order to provide more information for analysis. The problems facing the project were Difficulties in upgrading existing graphic t ourist guides and charts, Lack of digital information for tourism facilities and attractions, Lack of detailed interne t-based information, and Inadequate State tourism research. So they start to set their objective that was to create a digital map of Amboseli National Park with information on the available park facilities as well as features and sites of tourist appeal.[8]

- Their research is proscribed to the zone covered by National Park "Amboseli" and buffer a distance of 1.3 KM from the external limit of the park, This is the area that lies approximately between the latitudes of 020 30S and 020 45S and longitudes of 370 05E and 370 25E and their data were collected by using a GPS receiver . they have chosen to use a lot like ArcView 3.2 for changing the

projection of the shapefiles to the preferred projection, Global Mapper 11 was used to georeference and geocode the topographic sheet, ArcGIS 10.[8]

## 1.3 Methodolgy

This study involves research on the area of study in order to determine and evaluate. [13]The required data was identified by carrying out a user-needs assessment. The main data used here is secondary data obtained is form of shapefiles, analogue maps and coordinate data. The data was then processed using various GIS software. ArcGIS tools were employed in the

- Shapefiles (roads, hotels and lodges, camps, swamps, and other facilities)
- Shapefiles (hotels, Egypt country boundaries) Coordinates
- Shapefiles (roads, hotels and lodges, camps, swamps, and other facilities) Format: Digital (points and polygons)
- Format: Digital(points, lines and polygons)
- Format: Csv file

## 1.4 Project Management and Deliverables

### 1.4.1 Tasks and Time Plan
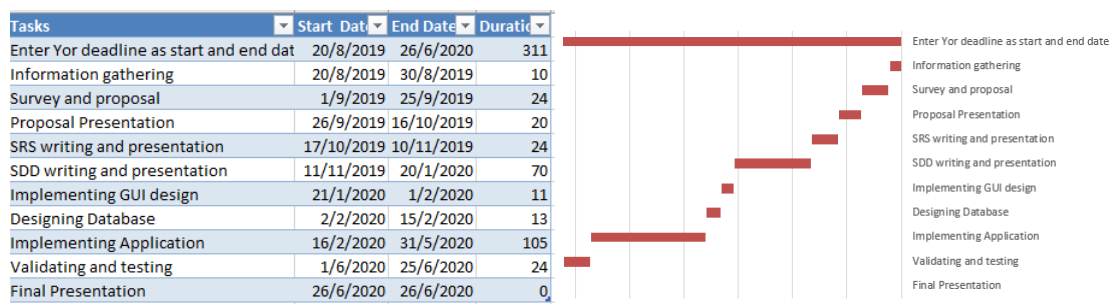


Figure 1.3: Time Plan

# Chapter 2

# System Requirements Specifications

### 2.0.1 Purpose of this document

Tourism is very important Topic for the economy of Egypt. It contains many tourist attractions sites. Improving tourism in Egypt would have great revenue on the economy. Our project main purpose is to create a tourism system in which it uses Geo-information with certain tools (ex. Arch GIS 10.7) which will greatly improve tourism sector in Egypt. This project aims to exhibit the application of Geo-information as a tool for im- proving the tourism sector by identifying the location of tourist facilities, Services and wildlife habitat locations in order to demonstrate them in a map so that tourists are well informed and directed in what to see and where to go.The World Tourism Organization describes tourism as an act of travel for leisure purpose and for the provision of facilities for this act. It describes that a tourist is someone who travels at least 80 kilometers away from home for recreational purposes [1].

### 2.0.2 Scope of this document

This Software Requirements Speciation (SRS) is the requirements that specific Tourism Management System. This system targets tourists to 1- Plan their trips to visit these protected areas. 2- It will help them also to rate their experience in Protective Parks.

### 2.0.3 Overview

Our system is a mobile application that determine important and necessary places for tourism that it will help tourists to plan their trips to visit protected areas and it will give detailed information about the place that will also provide information of nearby Public Service close to this protected area. Also it will let them to rate their experience in protective area. It will also increase the accuracy of identifying locations suitable to tourists based on detailed information  generate RATING to give best decision.

### 2.0.4 Business Context

Our work is motivated by both related works and application domain. As the national parks play a huge role as a touristic point that attract tourists from all around the world (19).In Egypt we have 30 national parks and 14 other national parks will be formed in the future as published by the EEAA (20).also the system contain a rating system that will rate the service provided by the application similar as the one that Michael Kenteris,
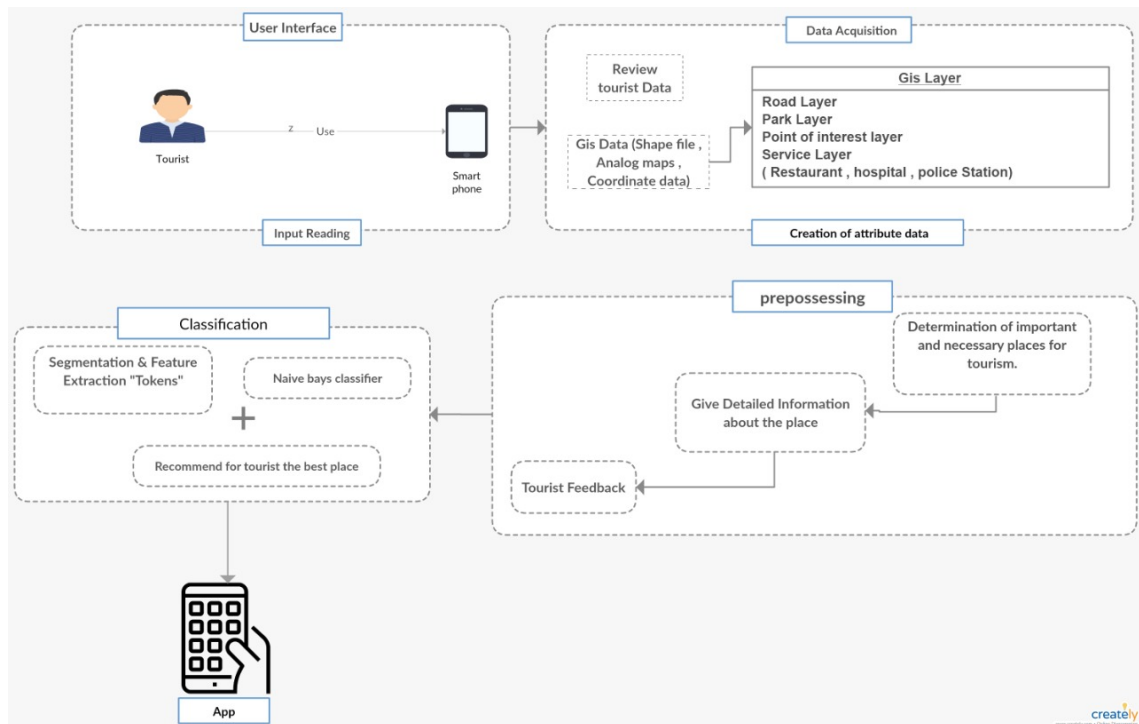
Figure 2.1: Overview Diagram

Damianos Gavalas and Aristides Mpitziopoulos has been tried to implement in greece (21). The project idea was presented to many companies that can invest in this field and they have shown a interest and if the system is working successfully they will invest in it.

## 2.1   General Description

### 2.1.1   Product Functions

—

1. Pre-processing
   (a) The system will split text into separate words.
   (b) System removes all the stop-words to filter the document.
   (c) System returns back the base or dictionary form of a word
   (d) System removes Punctuation the document
   (e) System change Lower Case all character
2. Classification
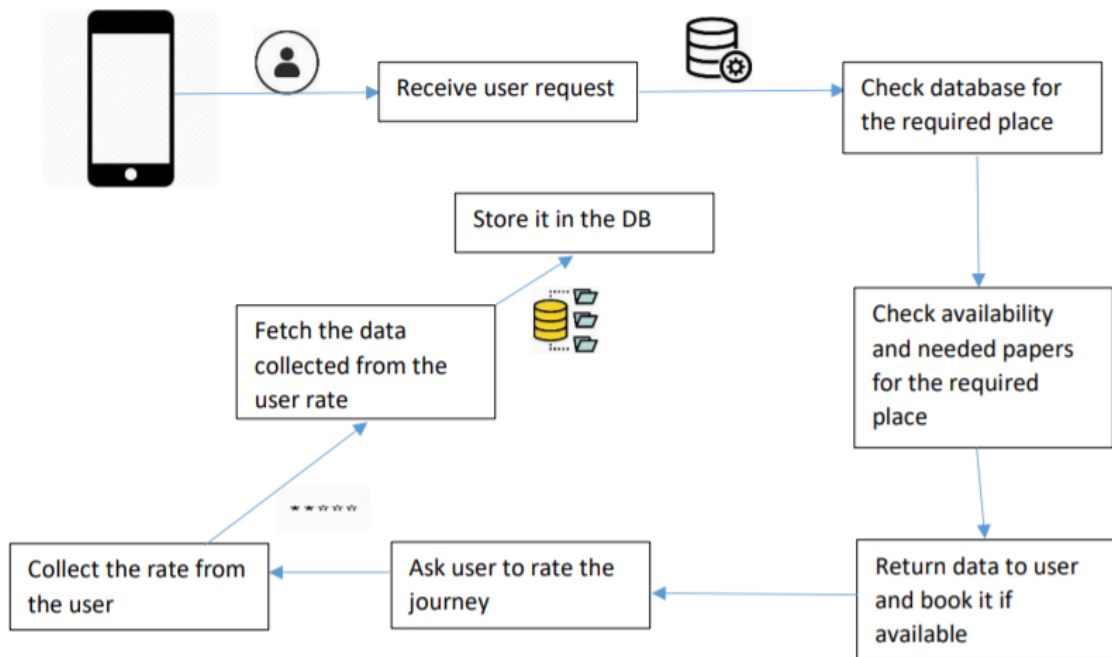
Figure 2.2: Business context

    (a) System use SVM and Naive Bayes.

3. Guest System

    (a) Route Navigation System

    (b) Report System

    (c) Feedback System

4. Admin System

    (a) Registration System

    (b) Feedback Approval System

### 2.1.2 Similar System Information

Tourism has multiple meanings of it. The World Tourism Organization describes tourism as an act of touring for the purpose of exercising and offering facilities for this operation. It further states that a tourist is someone traveling at least eighty kilometers from home for leisure purposes[15].Therefore, for recreation, company and other purposes relevant to the exercise of an occupation remunerated from within the place visited, tourism may be said to be the activities of people traveling to and staying in places outside their
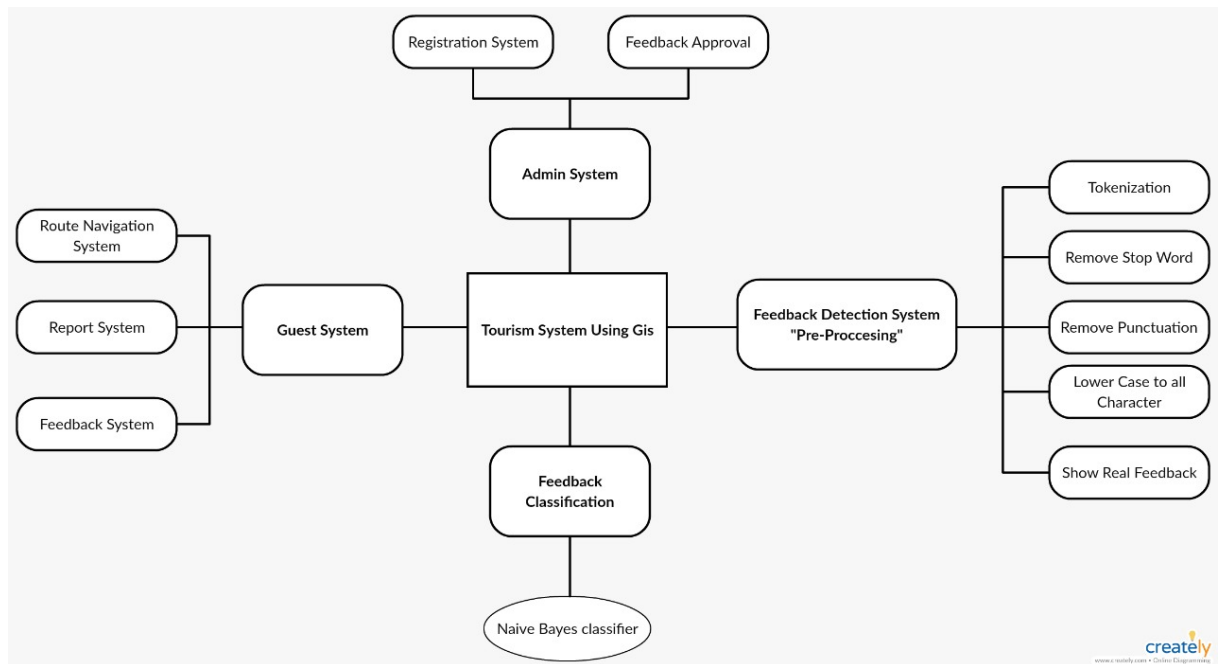
Figure 2.3: Context Digram

daily environment for no more than one sequential year.The tourist destination is a geographical unit. How important any geographical unit is as a tourist destination or how important it is potentially; is determined by three [16]prime factors which constitute the tourism product. It comprises of the perceived and actual attractions of a place, the facilities and the destination's accessibility National Parks and Reserves are distinctive public lands or water bodies within a country which are set aside by the government to protect ecosystems, plant and animal species, scenic landscapes, geologic formations, historical or archaeological sites and such.[17] There is a project has been made by a team in university of Nairobi their case study was AMBOSELI NATIONAL PARK that demonstrates the importance of Geo-information. A topographic map and other data from KWS have been used in this study to create a geodatabase and a digital map of the Park using GIS software. Features were digitized on the scanned map and other data inform of shape files added as overlays. An attribute table was created to link the spatial data with their characteristics in order to provide more information for analysis. The challenges facing the project are difficulties in updating current graphic tourist guides and charts, lack of digital information for tourism facilities and attractions, lack of detailed internet-based information, and insufficient state tourism research. So they start to set their objective that was to create

a digital map of Amboseli National Park with statistics on the available park facilities as nicely as functions and web sites of tourist appeal.[18] Their research is limited to the area covered by Amboseli National Park and a buffer distance of 1.3 kilometers from the external bounds of the park, This is the area that lies approximately between the latitudes of 020 30S 020 45s , longitudes of 370 05e 370 25e and their data were collected by using a GPS receiver . they have chosen to use a lot like ArcView 3.2 for changing the projection of the shape files to the preferred projection, Global Mapper 11 was used to geo-reference and geo code the topographic sheet, ArcGIS 10.[18]

### 2.1.3   User Characteristics

- 1. Tourist: -Must have basic knowledge on how to use android applications or ios applications according to his mobile device.
- 2. Admin: -must have full knowledge on how the application is working and the hierarchy of adding or deleting data from the application database.

### 2.1.4   User Problem Statement

There are insufficient information about the attractive areas in Egypt for example Google maps gives maps without Attributes of location so we will deploy Tourism Management System Using GIS for natural protected areas in Egypt to help tourists to plan their trips to visit these Protected areas. Also Increase the accuracy of Identifying locations suitable to tourists based on detailed information  Generate RATING to give best decision. [15]

### 2.1.5   User Objectives

Our objectives is Deployment of Tourism Management System Using GIS for natural protected areas in Egypt to help tourists to plan their trips to visit these protected areas. Rate the Tourist experience in Protective Parks, provide information of nearby Public Service close to the user's location. Provide description as well as contact and address info of the place.

### 2.1.6 General Constraints

One of the main constraints of the system is the ability to collect all the data accurate from a credible source, also the ability to provide a true ranking system makes that could be a reference for the users before planning their trips, and to provide all needed papers and corresponding transportation for the chosen national park. Different problems would be challenging the system.

## 2.2 Functional Requirements

### 2.2.1 User Class 1 - The Admin

#### 2.2.1.1 ID: FR1

| | |
|---|---|
| Title | Adding a Trip |
| DESC | The Admin adds a Trip to the system |
| Input | Name ,Location ,Time ,Telephone , Website of The Park |
| Action | Checks if all fields are filled and if so the data is entered in a new record the database accordingly |
| Output | Confirmation message or error message if something went wrong upon validating the fields |
| Pre-condition | None |
| Post-condition: | Database is updated with a new Trip |

### 2.2.1.2   ID: FR2

| Title | Editing a Trip |
|---|---|
| DESC | The Admin edits a Trip's information |
| Input | Name ,Location ,Time ,Telephone , Website of The Park |
| Action | The information changed is taken and sent to the corresponding attribute in the Trip's record in the database to be updated |
| Output | Confirmation message or error message if something went wrong upon validating the fields |
| Pre-condition | Desired Trip information is already registered in the database |
| Post-condition: | Desired Trip record in the database is updated with the new information in the database |

### 2.2.1.3   ID: FR3

| Title | Deleting a Trip |
|---|---|
| DESC | The Admin Delete a Trip From the system |
| Input | Name ,Location ,Time ,Telephone , Website of The Park |
| Action | Checks for the selected Trip's record in the database to be deleted |
| Output | Confirmation message or error message if something went wrong upon removing th Trip from the system |
| Pre-condition | Desired Trip is already registered in the database |
| Post-condition: | Desired Trip record is removed from the database |

**2.2.1.4  ID: FR4**

| Title | Listing all Trip |
|---|---|
| DESC | The Admin lists all the Trips found in the system |
| Input | Name ,Location ,Time ,Telephone , Website of The Park |
| Action | Retrieves information about the Trips registered in the system from the database |
| Output | All Trips registered in the system and their information are previewed |
| Pre-condition | At least one Trip is registered in the database |
| Post-condition: | None |

**2.2.1.5  ID: FR5**

| Title | Searching For a Trip |
|---|---|
| DESC | The Admin searches for a desired Trip. |
| Input | Name |
| Action | Retrieves information about the Trip, whose name has been entered by the admin, from the database |
| Output | The desired Trip's information is previewed |
| Pre-condition | Desired Trips is already registered in the database |
| Post-condition: | None |

**2.2.1.6  ID: FR6**

| Title | Adding a Business Monitor |
|---|---|
| DESC | The admin adds a business monitor record to the database |
| Input | Name ,Location ,Time ,Telephone , Website of The Park |
| Action | Checks if all fields are filled and if so the data is entered in a new record in the database accordingly |
| Output | Confirmation message or error message if something went wrong upon validating the fields |
| Pre-condition | None |
| Post-condition: | Database is updated with new business monitor's account |

### 2.2.1.7 ID: FR7

| Title | Editing a Business Monitor's Account |
|---|---|
| DESC | The Admin edits a business monitor's account to the database |
| Input | Name ,Location ,Time ,Telephone , Website of The Park |
| Action | The information changed is taken and sent to the corresponding attribute in the Tr record in the database to be updated |
| Output | Confirmation message or error message if something went wrong upon validating the fields |
| Pre-condition | Desired business owner is already registered in the database |
| Post-condition: | Desired business owner's record in the database is updated with the new informat in the database |

### 2.2.1.8 ID: FR8

| Title | Deleting a Business Monitor's Account |
|---|---|
| DESC | The Admin deletes a business monitor's account from the database |
| Input | Business Monitor's name |
| Action | Checks for the selected business monitor's record in the database to be deleted |
| Output | Confirmation message or error message if something went wrong upon removing the business monitor from the system |
| Pre-condition | Desired business monitor is already registered in the database |
| Post-condition: | Desired business monitor's record is removed from the database |

### 2.2.1.9 ID: FR9

| Title | Listing all Business Monitors |
|---|---|
| DESC | The Admin lists all the business monitors found in the system |
| Input | User Type. |
| Action | Retrieves information about the business monitors registered in the system from the database |
| Output | All business monitors registered in the system and their information are previewed |
| Pre-condition | At least one business monitor is registered in the database |
| Post-condition: | None |

### 2.2.1.10 ID: FR10

| Title | Searching for a Business Monitor |
|---|---|
| DESC | The Admin searches for a desired business monitor |
| Input | Name |
| Action | Retrieves information about the business monitor, whose name has been entered by the admin, from the database |
| Output | The desired business monitor's information is previewed |
| Pre-condition | Desired business monitor is already registered in the database |
| Post-condition: | None |

#### 2.2.1.11 ID: FR11

| Title | Deleting a Tourist's Account |
|---|---|
| DESC | The Admin deletes a Tourist's account from the database |
| Input | Tourist's name |
| Action | Checks for the selected Tourist's record in the database to be deleted |
| Output | Confirmation message or error message if something went wrong upon removing the Tourism from the system |
| Pre-condition | Desired Tourist is already registered in the database |
| Post-condition: | Desired Tourist's record is removed from the database |

#### 2.2.1.12 ID: FR12

| Title | Listing all Tourist |
|---|---|
| DESC | The Admin lists all the Tourist found in the system |
| Input | User Type |
| Action | Retrieves information about the Tourist registered in the system from the database |
| Output | All Tourist registered in the system and their information are previewed |
| Pre-condition | At least one Tourist is registered in the database |
| Post-condition: | None |

#### 2.2.1.13 ID: FR13

| Title | Searching for a Tourist |
|---|---|
| DESC | The Admin searches for a desired Tourist |
| Input | Name |
| Action | Retrieves information about the Tourist, whose name has been entered by the admin,from the database |
| Output | The desired Tourist's information is previewed |
| Pre-condition | Desired Tourist is already registered in the database |
| Post-condition: | None |

### 2.2.2    User Class 2 - The Tourist

#### 2.2.2.1    ID: FR14

| Title | Registering |
|---|---|
| DESC | The Tourist registers with his/her information to create an account |
| Input | Name ,password ,Email ,Country ,Telephone , Gender of The Tourist |
| Action | Checks if all fields are filled and if so the data is entered in a new record in the database accordingly |
| Output | Confirmation Message and asks Tourist to log in or error message upon validating the fields |
| Pre-condition | None |
| Post-condition: | Database is updated with a new Tourist's account |

#### 2.2.2.2    ID: FR15

| Title | Log in |
|---|---|
| DESC | The Tourist logs into his account |
| Input | Email and password of The Tourist |
| Action | Checks if all fields are filled and if so compares data entered to the database record |
| Output | The homepage is previewed and Login successful message or error message upon validating the fields |
| Pre-condition | Tourist is already registered in the database |
| Post-condition: | Redirected to the homepage |

### 2.2.2.3   ID: FR16

| Title | Request Trip. |
|---|---|
| DESC | The Tourist requests a Trip sending his/her current location which is sent to Admi |
| Input | current location of The Tourist |
| Action | The Tourist chooses to request a Trip and allows his/her current location to be sen |
| Output | Message that request has been sent or error message that it hasn't |
| Pre-condition | At least one trip registered in the system |
| Post-condition: | Redirected to the homepage |

### 2.2.2.4   ID: FR17

| Title | Rate the Trip |
|---|---|
| DESC | The Tourist views the rating of the Trip that has accepted his request |
| Input | Feedback text |
| Action | The rating entered is used to calculate the new overall rating for the Trip. Note that this is the personal rating. |
| Output | message confirming that the rating has been done or error message upon validating fields |
| Pre-condition | The Trip is registered in the system |
| Post-condition: | Trip's rating is updated in the Trip's record in the database. |

### 2.2.2.5 ID: FR18

| Title | View Trip's rating |
|---|---|
| DESC | The Tourist views the rating of the Trip that has accepted his request. |
| Input | None |
| Action | : The rating of the Trip that has accepted the request is retrieved from his/her record in the database. |
| Output | The value of the Trip's rating is previewed. |
| Pre-condition | The Trip is registered in the system. |
| Post-condition: | None |

## 2.2.3 User Class 3 - The Classification of Feedback

### 2.2.3.1 ID: FR19

| Title | Tourist Review |
|---|---|
| DESC | Data consultant can list all the reviews have been written by the Tourist. |
| Input | Tourist ID or email |
| Output | all the Tourist reviews records |
| Pre-condition | no show of the list of reviews |
| Post-condition: | show the updated list of reviews for this Tourist |

### 2.2.3.2 ID: FR20

| Title | TokenizeText |
|---|---|
| DESC | It takes each review and splits it to array of words "Tokens" also removing all the spaces and the breaks in each review ,for simplifying the review processing |
| Input | Review Text |
| Output | Array of words |
| Pre-condition | text in it's original form |
| Post-condition: | it gets text without spaces or breaks |

### 2.2.3.3   ID: FR21

| | |
|---|---|
| Title | RemoveStopWords |
| DESC | It take the array of words output and removes any stopword such as :("as","the"," |
| Input | array of words |
| Output | array of words without any stopwords |
| Pre-condition | text in it's original form |
| Post-condition: | it gets text filtered from stopwords |

### 2.2.3.4   ID: FR22

| | |
|---|---|
| Title | LowerCase To All |
| DESC | It take the array of words output and Convert into Lowercase |
| Input | array of words |
| Output | array of words with LowerCase only |
| Pre-condition | text in it's original form |
| Post-condition: | it gets text filtered from UpperCase |

### 2.2.3.5   ID: FR23

| | |
|---|---|
| Title | Remove Punctuation |
| DESC | It take the array of words output and remove Punctuation |
| Input | array of words |
| Output | array of words withput Punctuation |
| Pre-condition | text in it's original form |
| Post-condition: | it gets text filtered from Punctuation |

### 2.2.3.6 ID: FR24

| Title | lemmatization |
|---|---|
| DESC | It take the array of words output and get the single forms of derived words such as:("students "::"student") |
| Input | array of words |
| Output | array of words consist the singular of each word |
| Pre-condition | text in it's original form |
| Post-condition: | it gets array of words with it's single or If it gets confused between words |

### 2.2.4 User Interfaces

Our Application will be user friendly. the user will not have more than five minutes to get acquainted of the application.the application will be on a an android smart phone.

#### 2.2.4.1 GUI

#### 2.2.4.2 API

the application programming interface, we used is pychram to be able to run and code the classifier and be able to manipulate and read the data-set into the classifier in order to train and test and have precise results.

### 2.2.5 Hardware Interfaces

- Computer
- Mobile

### 2.2.6 Communications Interfaces

- wireless LAN
- 3G or 4G

### 2.2.7 Software Interfaces
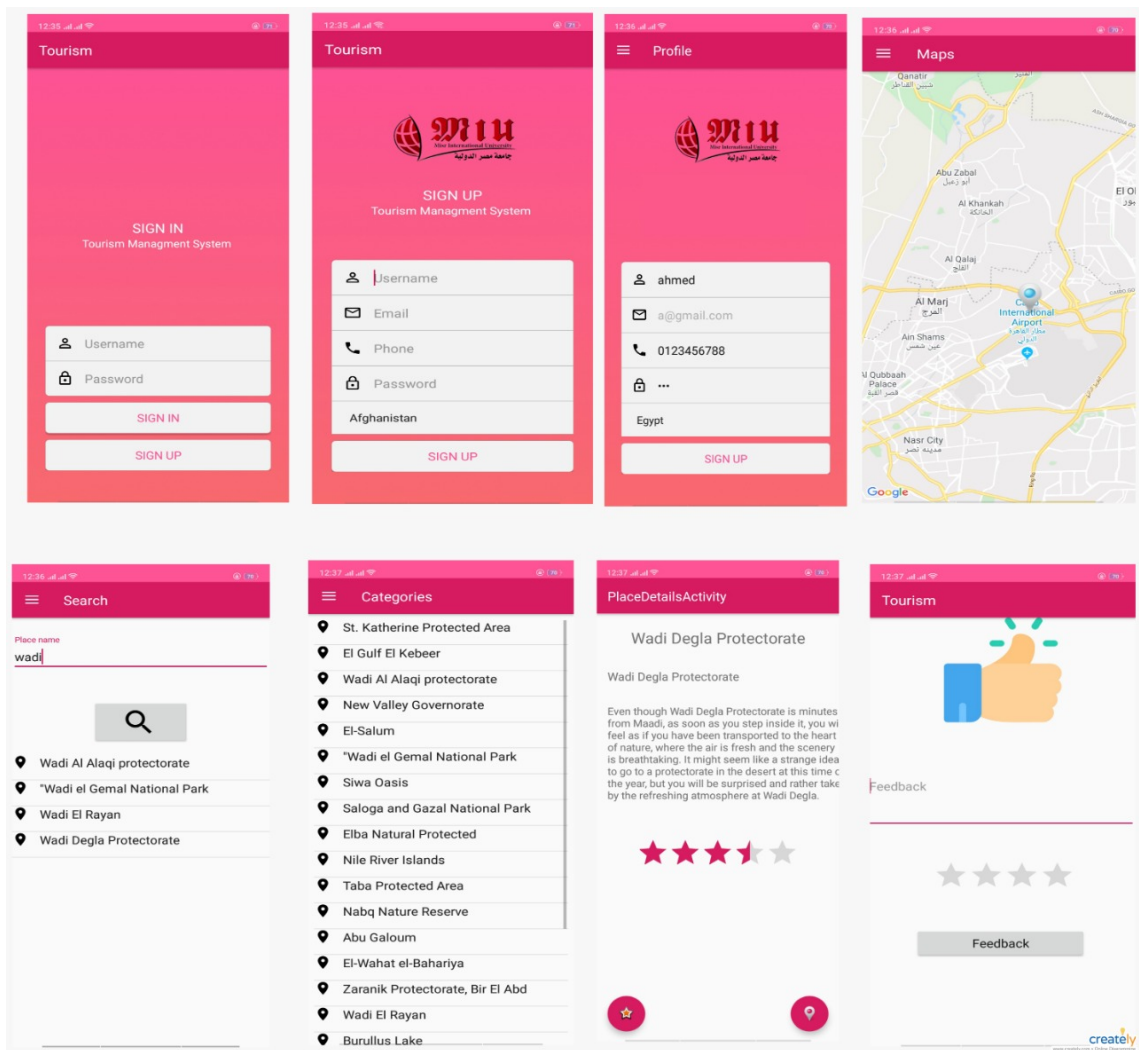
- Android Studio

Figure 2.4: GUI

- Arc Gis
- Pycharm

## 2.3   Performance Requirements

Specifies speed and memory requirements.

## 2.4   Design Constraints

- constraints of the system is the ability to collect all the data accurate from a credible source
- the ability to provide a true ranking system makes that could be a reference for the users before planning their trips
- to provide all needed papers and corresponding transportation for the chosen national park

## 2.5   Other non-functional attributes

### 2.5.1   Performance and Speed

The application must be interactive and fast to let the tourist choose what he desires.

### 2.5.2   Reliability

The application is reliable. It must make sure that the system is reliable in its operations. This would be mainly focusing on the detection and classification. As detection of rating should be accurate and error free. When a detected wrong response from the tourists it must be classified, so it the system knows about this response and keep it in the system database.

### 2.5.3   Scalability

The Application is scalable. It should be easy to maintain to Minimize the amount of changes that would be done to the code.

### 2.5.4    Usability

Proportion of functionalities or tasks mastered doesn't need time to be learned. Also, this system is easy to be memorized due to the small number of tasks the Users will do.

### 2.5.5    Portability

The Application is Portability. The system is designed to be with tourists at all time. The designed system is integrated as mobile application.

## 2.6    Preliminary Object-Oriented Domain Analysis

The class digram presents a list of the fundamental objects that must be modeled within the system to satisfy its requirements. The purpose is to provide an alternative, structural in order to view on the requirementsand how they might be satisfied in the system.

### 2.6.1    Inheritance Relationships

in our class digram we used inheritcance relationship and other relationships, foucinsing on Inheritance Relationships for example: we used primary inheritance hierarchy for the system.

## 2.7    Operational Scenarios

### 2.7.1    User

The user should make sure that he is connected to the internet, then he will start to create an account on our application server. After creating an account he should be able to log in after entering his username and password correctly, if they weren't entered correctly the system will pop up a message to the user to check username and/or password, after logging in successfully the user will be entered to a screen where he is able to search for his target national park he want to visit or he can explore our list of most rated national parks. Then he will choose a national park and a screen will appear to the user with all data of his chosen national park like prices, description, if any security papers or conditions will be provided throw this screen. Finally, after reading all documents needed and the user select this national park he will receive an option if he want to check about available
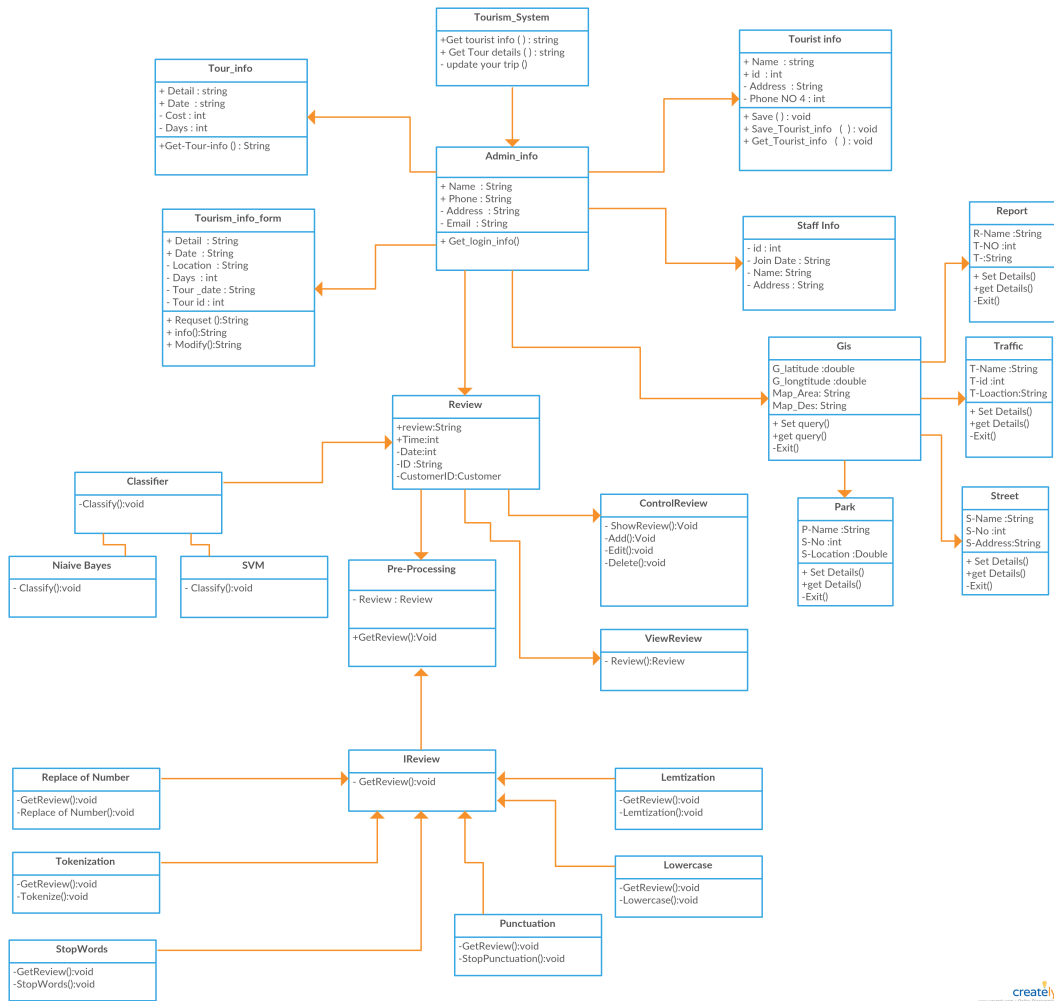
Figure 2.5: classDigram

Figure 2.6: Inheritance Relations

transportations that go toward this national park (bus, train, cars). Also, an accommodation could be suggest if there is any available hotel near the national park. Then, check out page will appear to the user with all date that he/she has booked and asking for the user confirmation to confirm all data and email them to the user with all confirmations.

### 2.7.2   Admin

The admin should be connected to the server through an internet connection. To make sure he logged in with the correct username and password of an admin account, he/she will redirected to the admin page where he could find all features available for an admin like collecting the feedbacks of a national park, edit data about each and every national park, can collect analysis for each national park and for each user, has the ability to delete a feedback or a review with bad language, also he can add or remove a national park according to any change could happen. The admin has the ability to accept or ignore any feedback or user according to the ethical rule or being a fake account, also the admin must accept each and every account of employees to make sure there isn't any account have access to the system outside the company

## 2.8 Preliminary Schedule Adjusted

| Task | Start-Date | End-Date |
|---|---|---|
| information Gathering | 20/8/2019 | 30/8/2019 |
| Survey and Proposal | 1/9/2019 | 25/9/2019 |
| Proposal Presentation | 26/9/2019 | 16/10/2019 |
| SRS Writing and Presentation | 17/10/2019 | 10/11/2019 |
| SDD Writing and Presentation | 11/11/2019 | 20/1/2020 |
| Implementing GUI design | 21/1/2020 | 1/2/2020 |
| Design Database | 2/2/2020 | 15/2/2020 |
| Implementing Application | 16/2/2020 | 31/5/2020 |
| Validating and Testing | 1/6/2020 | 25/6/2020 |
| Final Presentation | 26/6/2020 | 26/6/2020 |

## 2.9 Preliminary Budget Adjusted

- Any smartphone with Android version 5.0 and up. On the user end,the minimum cost of any sufficient internet package required to operate the program which varies from 50 EGP to 250 EGP. on the back end, we also require a Non-sql database such as Fire-base for real-time updates which costs around 1,650 dollars. The price of an appropriate mid-range sever is between 4000 dollars and 4,495 dollars.

# Chapter 3

# Software Design Document

### 3.0.1  Purpose

The purpose of the software design document is to provide a full description of the architecture and system design of tourism management system and rating system. This document will explain the components of the system in the block diagram, illustrate how certain tasks done between system and the user with sequence diagram[1], the development and implementation of the project represented in class diagram also the explain the logical structure of the database represented in ER diagram.

### 3.0.2  Scope

Tourist will benefit from this application to get fully certified data about national park for free as it is done for an academic purpose also, the application will be available in many interface that will be available for almost all devices to cover the maximum number of users. Application will provide users with feedbacks of each park to make sure the tourist get a real feedback for is target national park to choose what he need the most from his trip.

### 3.0.3  Overview

Tourists cannot access all Egyptian protected areas they can access only few of it. So, this system will help tourists to know all about protected areas in Egypt from its road and services around each of them. Rating system of protected areas aims to give tourists a trustworthy feedback of protected areas on many classes; which also will help and assist protected areas managers to improve it if possible and also it will assist tourists which protected area matches tourists. This document explains the use of computer science for tourism.

### 3.0.4    Definitions and Acronyms

| Term | Definition |
|---|---|
| Software Design Document (SDD) | Used as the primary medium for communicating software design information. |
| NLTK | Natural Language Toolkit is a platform used for building Python programs that work with human language data for applying in statistical natural language processing. |
| NLP | Natural language processing is a subfield of computer science, information engineering, and artificial intelligence concerned with the interactions between computers and human languages. |

## 3.1    System Overview

Tourist will use only a smart phone to use application. In order to get a high accuracy of rating system of protected areas , The system has to make some tasks from classification and preprocessing, That the use of (svm, naïve bays) classifiers in rating system after (Tokenize, remove non ascii, remove punctuation, remove stop words, to lowercase) will increase the accuracy and use Geographic information system on developing maps that offers the ability to manipulate and maximize data, be it spatial. Also, there will be a business monitor to view detailed rating of any tourist, tourist can view park's location and rate park and give feedback.
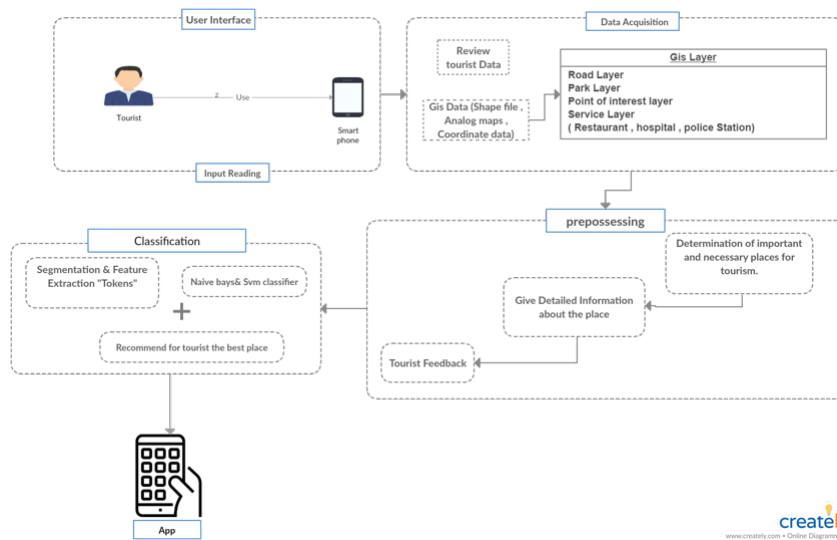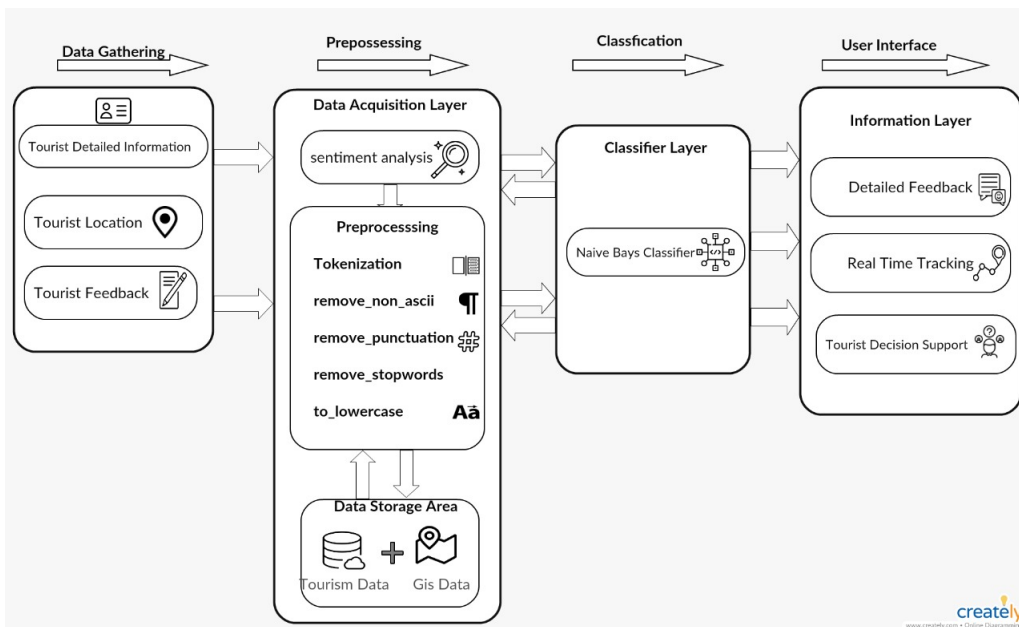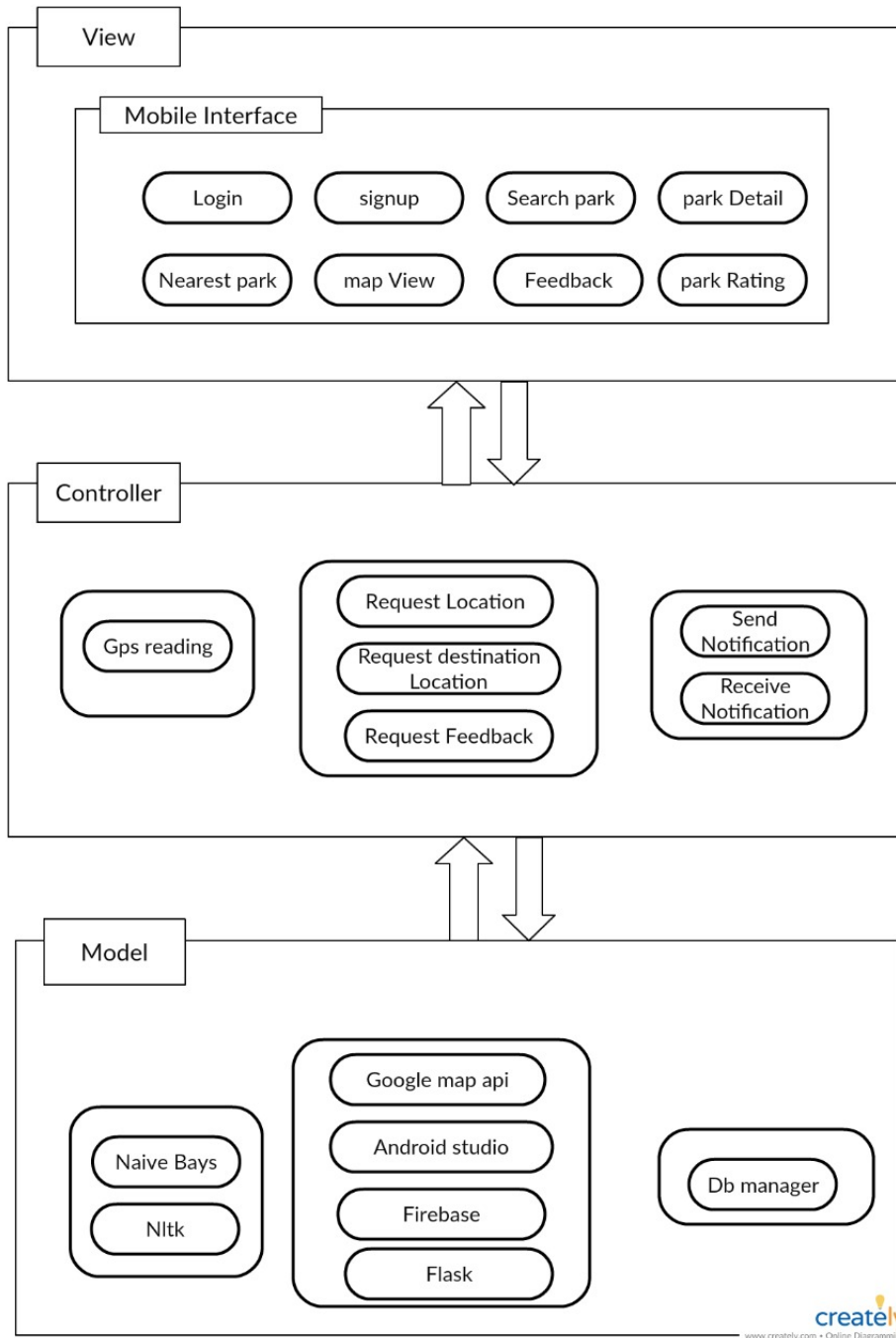
Figure 3.1: Overview



Figure 3.2: block

Figure 3.3: MVC

## 3.2    System Architecture

### 3.2.1    Architectural Design

#### 3.2.1.1    Model

The interpreter and expert models deal with simultaneous interpreters that will interact with the system either by using the main interpreting functionality or add and extract data from database.

#### 3.2.1.2    View

It is responsible for presentation of data and information throughout the user interface (UI).

#### 3.2.1.3    Controller

It is responsible for binding the view and model.the interactions and requests made within the view are taken and sent to the database to fetch data with the use of models then it forward data to the view again to be shown.

### 3.2.2    Decomposition Description

#### 3.2.2.1    System Sequence Diagram

Each step that occurs across all subsystems to achieve text analysis is described in the figures below.

#### 3.2.2.2    Classification Sequence

Rationale: The user can input text (Review) to the system in the form of plain text and receive a Rating from all classes the user review.

Input: Text (Review).

Output: Rating.

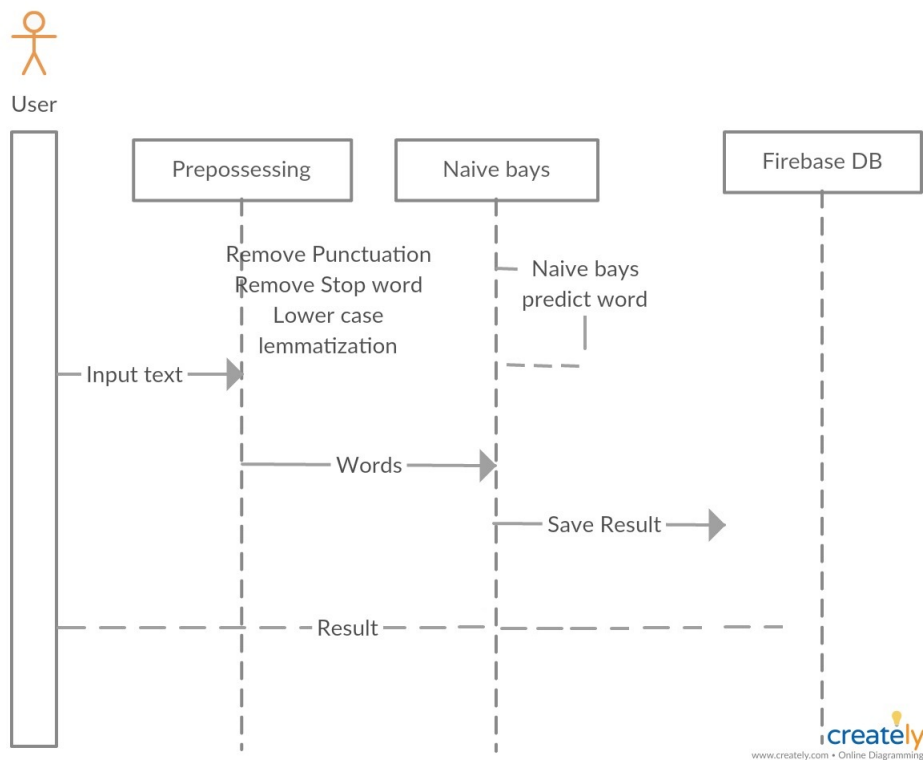Priority: High. This is an important functionality in system.
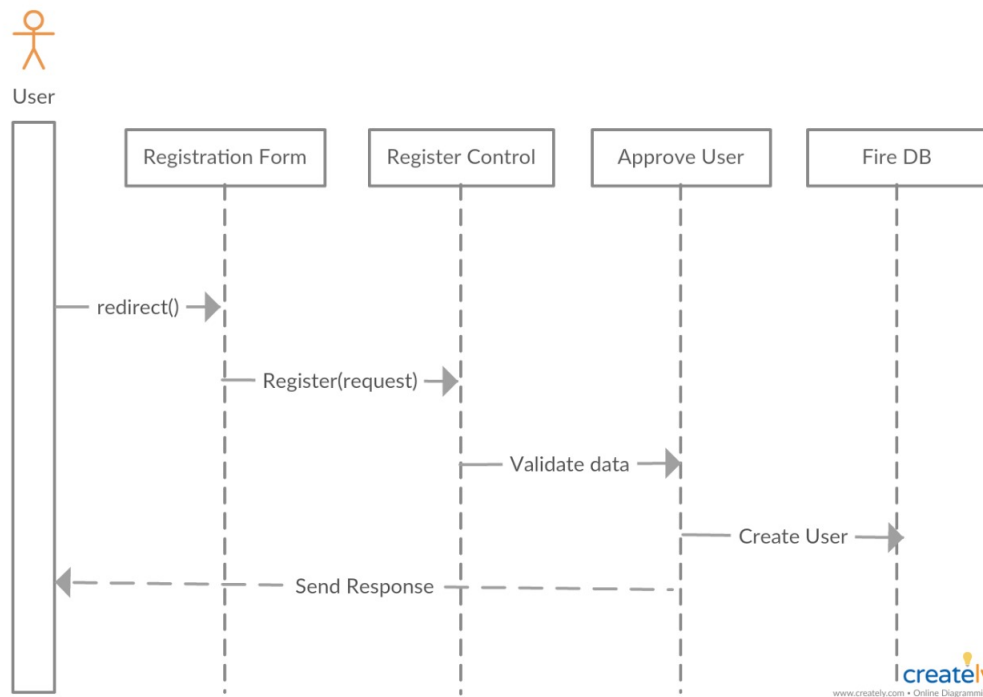
Figure 3.4: Classifier

Figure 3.5: Register

### 3.2.2.3 User Register Sequence

Rationale: The user should register for an account before being able to use the application.

Input: name, e-mail, password.

Output: Validation response.

Priority: Medium. Each user must have an account and become assigned a role before being able to use the application.

### 3.2.2.4 User login Sequence

The User should login to be able to enter-act with the system.

Input: name, e-mail, password.

Output: Validation response.

Priority: Medium. Each user must have an account and become assigned a role before being able to use the application.
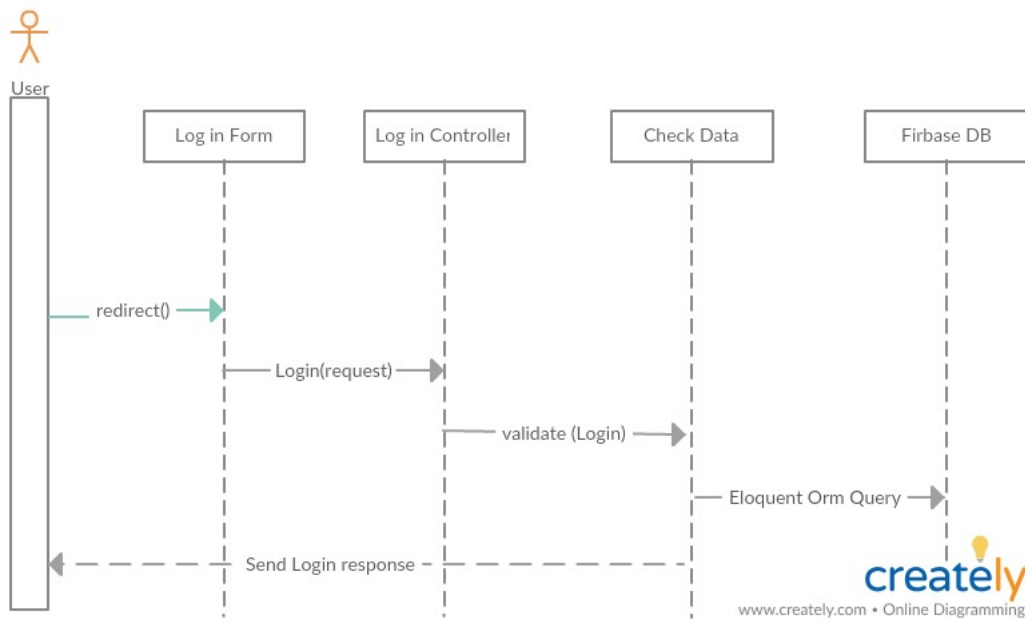
Figure 3.6: Login

### 3.2.2.5   check parks Sequence

The system should be able to search and identify the national park that the tourists (User) want to go to it.

Input: park name, address.

Output: search response.

Priority: high.

### 3.2.2.6   Add Business Monitor Sequence Diagram

Rationale: Admin can add Business Monitor record.

Input: Text (Name ,Location ,Time ,Telephone ,Website of the park).

Output: Response message if some thing went wrong or not then add new record into firebase.

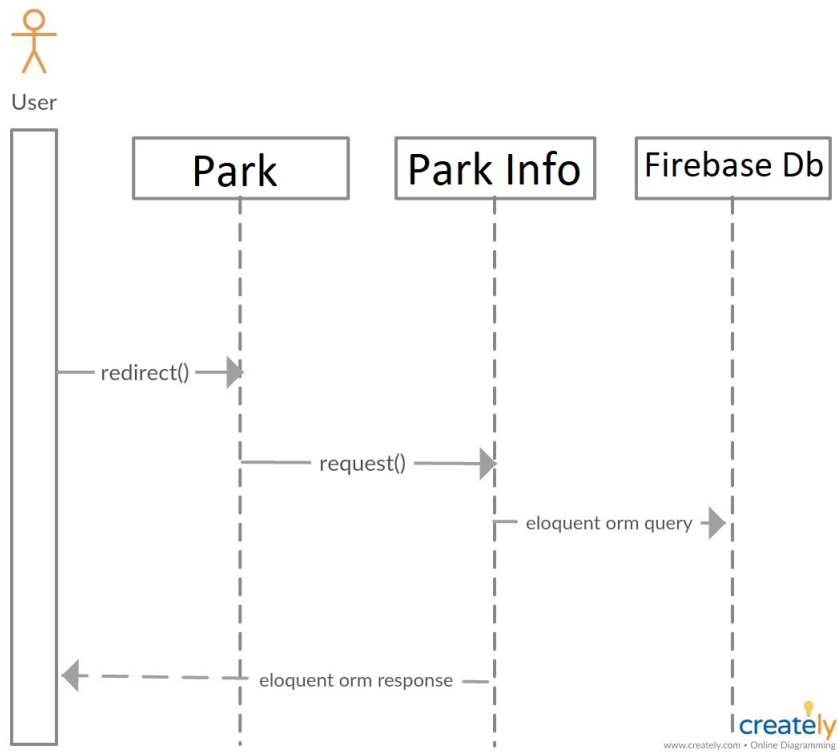Priority: High. This is an important functionality in system.
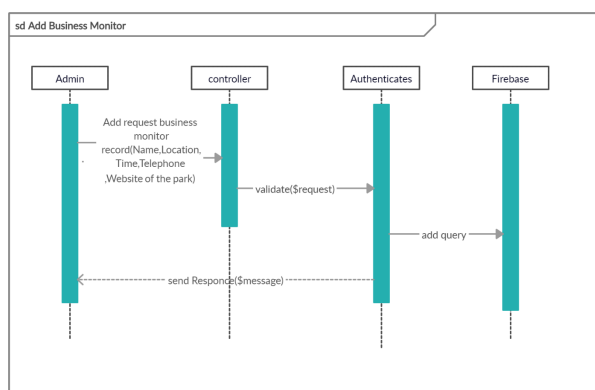
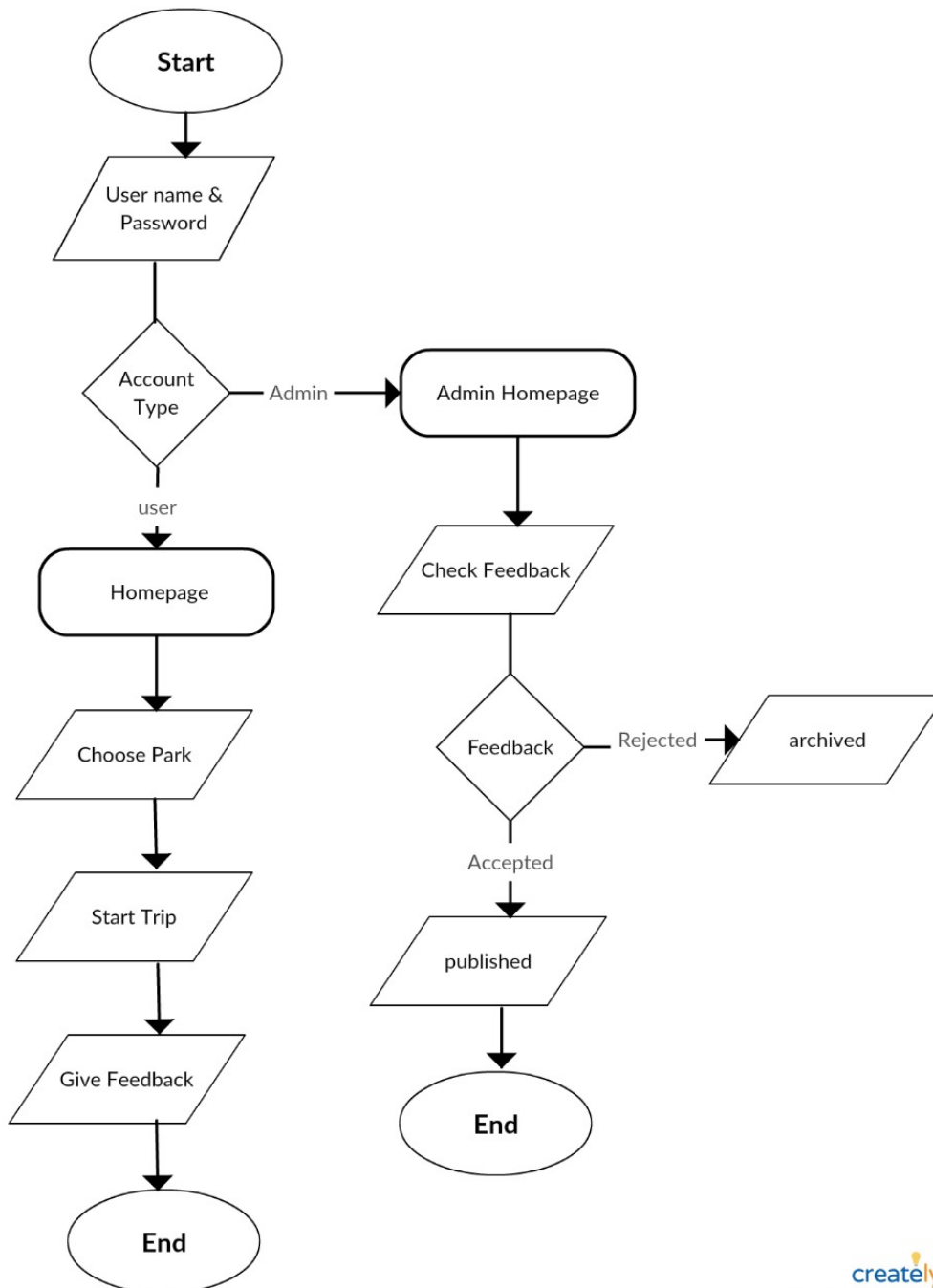Figure 3.7: Check Park



Figure 3.8: Business monitor

Figure 3.9: process

### 3.2.3  Process Diagram

### 3.2.4  Design Rationale

As mentioned previously, we have used MVC as our architecture as it helped us separate the functionality and data of our system from the presentation. In MVC design pattern, where the model (Cloud) handles the back-end processing like feature extraction and classification, the controller takes the information from the model and deliver it to the view for the user interface, the view takes the event from the user using the event listeners and deliver it to the controller, then the controller gives it to the model for further processing. So, we can easily make modifications, re-use and optimize functionality part as it is our core. Also the software we are developing efficiency and accuracy is a very important aspect of it so it will be very sensitive with data so this should be developed in a very accurate and efficient way.

### 3.2.5  Possible Algorithms

There had been so many opportunity algorithms that we should have used like decision Tree and SVM which might be generally excellent for text classification.

Naive Bayes: It works on conditional probability. It calculates the probability of the input relative to some decisions that was previously taken. It is well suited when the input has large number of dimensions. Decision Trees: It is a decision support tool that uses a tree-like model of 11 decisions and their possible consequences, including chance event outcomes, resource costs, and utility. It is one way to display an algorithm that only contains conditional control statements. SVM: Linear SVM is given a set of train data which belong to a certain class to find an optimal separating line. It tries to maximize the distance between each class to avoid misclassification. Then a test data are given to be classified to one of the classes formed before.

### 3.2.6  Frameworks

There are a couple of frameworks that may be used like Django and Laravel and flask frameworks for PHP to make the transition from the python to the internet app smooth to hold and scalabale. Flask: Flask is a micro net framework written in Python. It is assessed as a microframework as it does no longer require precise tools or libraries.It has no database
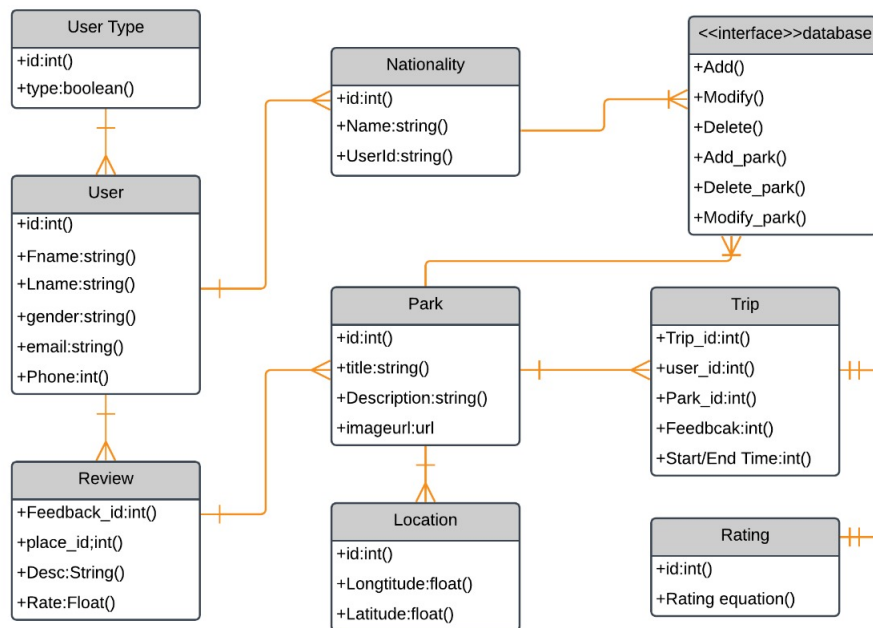
abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. PHP Laravel: Laravel is a free, open-source PHP web framework, intended for the development of web applications following the (model -view -controller) architectural pattern. It was mainly used for the creation and maintaing of the web applicataion. Django API: Django REST framework is flexible toolkit for building Web APIs. Django is a high-level Python Web framework encouraging rapid development and pragmatic, clean design. A web application framework is a toolkit of components all web applications need. Meaning that we with the help of flask we can integrate out python code which contains the machine learning part and text classification into the web app with ease.

## 3.3   Data Design

### 3.3.1   Data Description

### 3.3.2   Data Dictionary

| user | Attribute: id, name , password, country, email, phone number. This table hold all data of each user and create an unique id for each user. |
|------|------|
| reviews | Attribute: feedback id, place id, description, rate. This table holds all feedback given by an user for each park and generate a rating for each park |
| parks | Attribute: id, title, name, image url , rate, title This table holds all information for each national park available in the system and holds also the rating of each park |
| Rating equation | Attribute:id This table holds all equation and the equation to calculate the rating for each park according to the given feedback. |
| User type | Attributes id,type This table holds each user type either admin or normal user. |
| Database "interface" | This table holds all methods will be used by an admin user. |
| trips | Attributes: trip id,user id,park id, feedback This table holds each trip by every user . |
| Trip road | Attributes: id This table holds the road of each trip referred by an id . |
| road | Attributes: id This table hold each road on the map. |
| Location | Attributes: latitude,longitude,park id This table holds each park location. |

# 3.4   Component design

-Naive bayes: classifier is a honest and effective algorithm for the class task. Even if we are operating on a statistics set with tens of millions of information with a few attributes, it is suggested to try Naive Bayes . Naive Bayes classifier gives exceptional effects whilst we use it for textual statistics analysis. Such as Natural Language Processing, as wanted in our project.

-SVM: A assist vector device (SVM) is a supervised system mastering version that makes use of category algorithms for -organization type problems. After giving an SVM model units of labeled training information for either of categories, they're able to categorize new examples.

## 3.4.1   Pre-Processing

### 3.4.1.1   Remove Punctuation

cleans up the string and remove all the punctuation marks. removes all punctuation's from a string. punctuations: "'!()-[];:'"¡¿./?@

### 3.4.1.2   Remove Stop Words

Stop Words: A stop word is a commonly used word (such as "the", "a", "an", "in") that a seek engine has been programmed to ignore, both whilst indexing entries for searching and when retrieving them as the result of a seek query. We would not need these words taking up area in our database, or taking up precious processing time. For this, we can eliminate them easily, via storing a listing of words that you do not forget to be forestall phrases. NLTK(Natural Language Toolkit) in python has a listed of stopwords stored in 16 different languages.

### 3.4.1.3   Lemmatization

Lemmatization is the process of grouping the special inflected sorts of a word so it analysed as a single item. Lemmatization brings context to the phrases. So it links words with similar which means to one phrase. Text preprocessing includes both Stemming as well as Lemmatization. Many times people find these two phrases confusing. Some deal

with these two as same. Actually, lemmatization is desired over Stemming due to the fact lemmatization does morphological analysis of the phrases.

#### 3.4.1.4 Lower case

changes all capital letters to small letters inorder to be transfered to the text classification method with out any errors.

### 3.4.2 Text Classification

After that we use the words to do text classification on the input text to extract the Rate of it. This was done by using the Naive Bayes Classifier. To complete the process we trained the Naive Bayes Classifier, it was used as it is the best Classification Method available working with text. The idea mainly is to create a model that can predict the the Rating of tourists using only words of the input text and to make the task of the Rating terms easier for users and tourists.

## 3.5 Human Interface Design

### 3.5.1 Overview of User Interface

Since there is a web interface for the system is for the business monitor end user, and an android based mobile application for the tourist's end user; therefore, we have two different user interfaces.Business Monitor Web Interface: The business monitor will be given his/her account to be able to log in. Once logged in, (s)he is redirected to the homepage which contains the users accounts and reviews. All web pages will be provided a navigation menu, too be able navigate through the website as desired.tourist's Android Application Interface: The tourists will be able to log in to his/her account and will be shown activity screen which will allow him/her to choose the park desired and then a route will be drawn from the starting destination to the end destination, there is also a menu in app to make the user more easily to navigate in the various activitys of the application, there are search for parks, see previous reviews of that park, see there comments, be able to rate and review for the whole aspects of the trip form the transportation to the food , weather and so on.

### 3.5.2 Screen Images

#### 3.5.2.1 Android Application
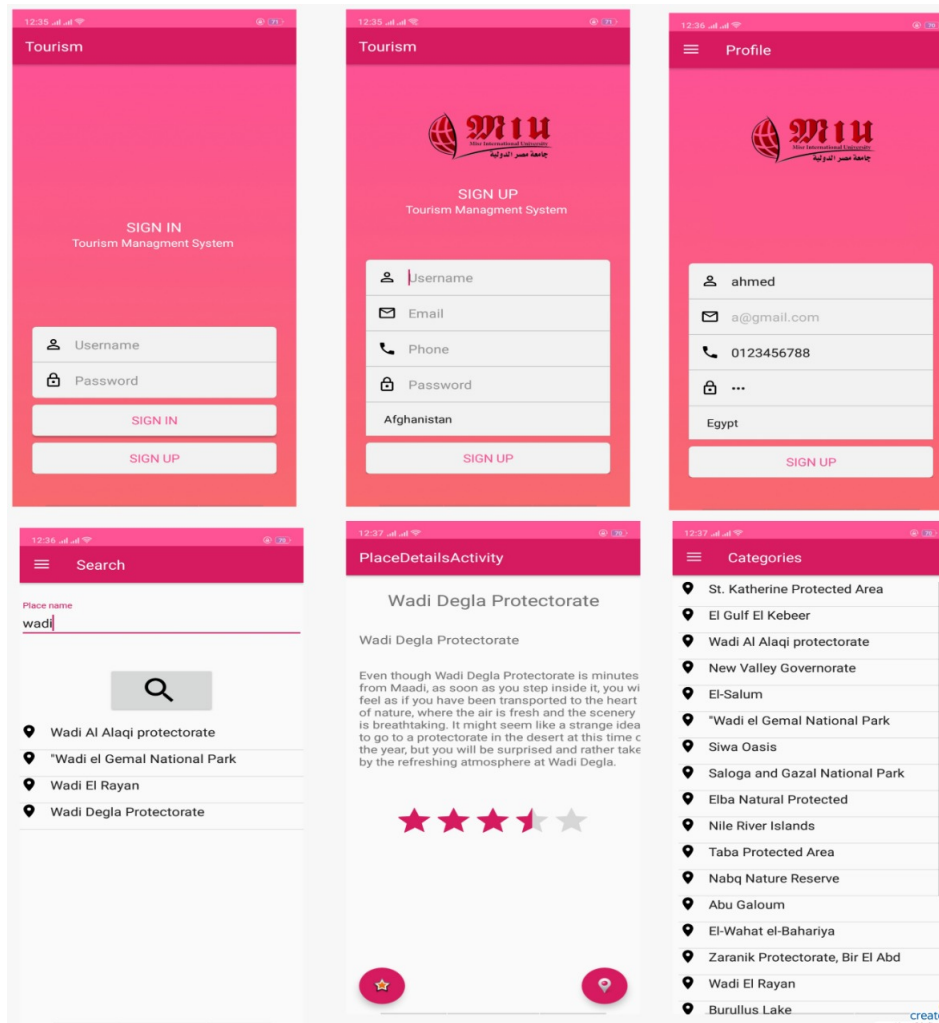
 GUI android

Figure 1 : Login
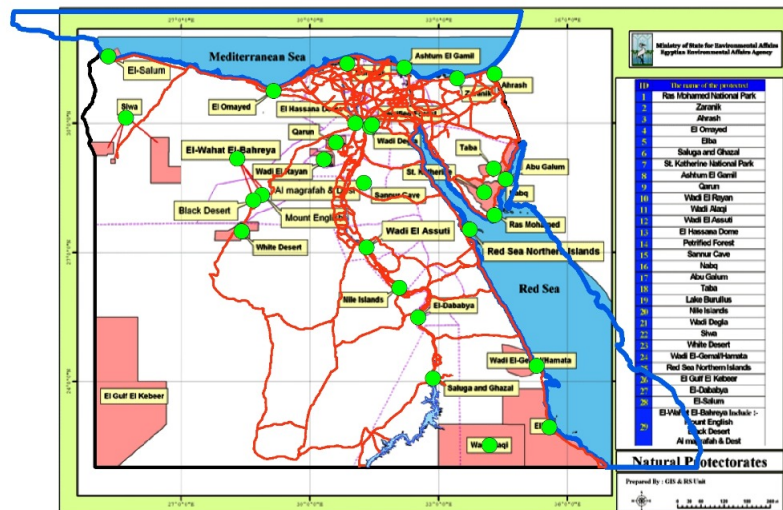
Figure 2 : Register

Figure 3 : Edit Profile

Figure 4 : Search for Park

Figure 5 : Rate and Re Park

Figure 6 : Parks list

### 3.5.2.2   Gis Application



GIS

effective GIS (Geographic Information System) statistics series app that lets in customers to create, edit, shop and percentage location-based records with one light, compact device it is integrates with famous computer GIS which include ArcGIS and QGIS, and the user pleasant interface hosts easy to use features that even those new to field data collection will master in minutes, including:

-Geotagged photos to give your important data a far more visual element than just a marker point

- Drop down forms for faster data collection

- Offline GPS tracking

- On-screen annotation tools to draw, add text and create shapes over your data

- Points, polygons and polylines

- Overlay coordinate grids see the exact distance between areas

- Import unlimited sized satellite, aerial, geological and other types of imagery format

- Import and export popular GIS formats such as Shapefiles and KML/KMZ

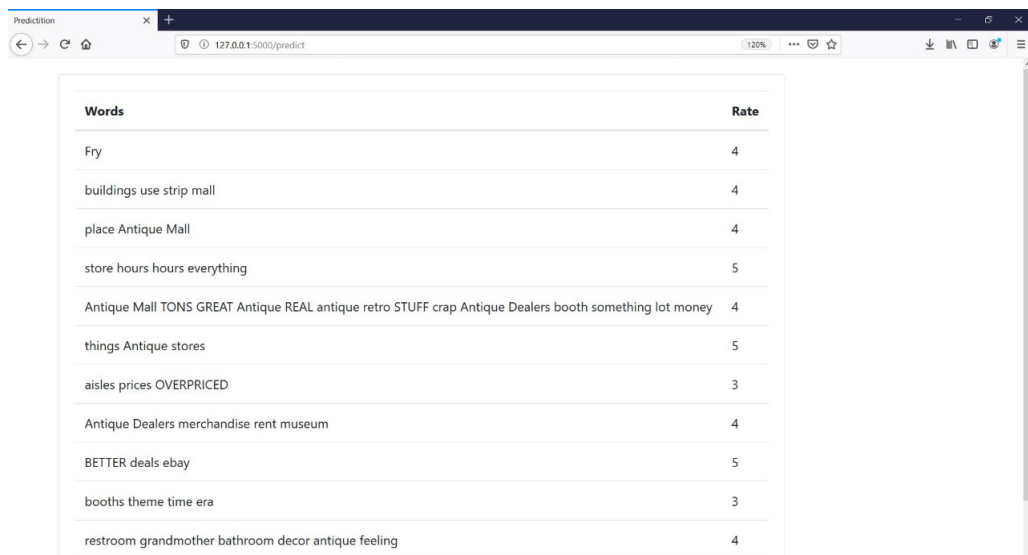### 3.5.2.3 Web Application
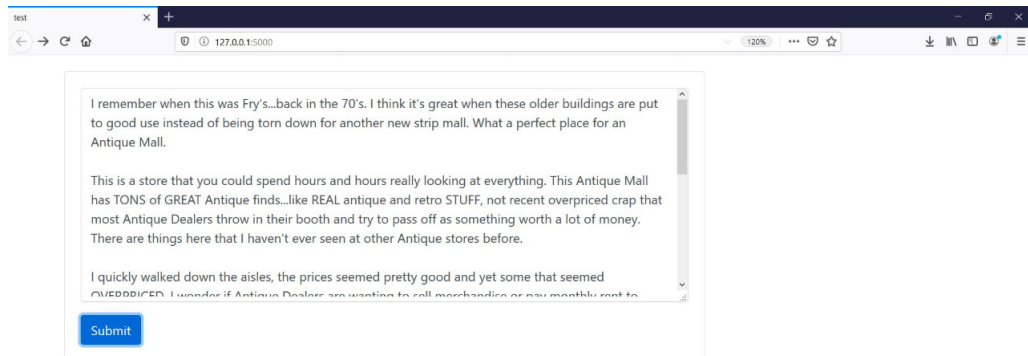


web

interface 1

in this web interface the text-box will be used as trial for the machine learing classification.



web

interface 2

the review will be tolkinzed and splite into words which will contain the rate of the user. it will be shown in form of table.

### 3.5.3 Screen Objects and Actions

• Search Button, to search for specific protected area.

Figure 1: search for protected area.

• This button show a full description of a protected area and its rating.
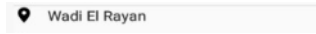


Figure 2: protected area button for each one.

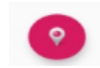• This button allows the tourist to view protected area location.



Figure 3: location button.

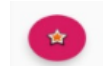• This button allows the tourist to review a protected area.



Figure 4: review button.

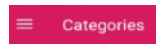• This button shows all protected area.



Figure 5: categories button.

## 3.6   Requirements Matrix

| | | | Requirements Traceability Matrix | |
|---|---|---|---|---|
| **ID** | **Status** | **Functional Requirement** | **Technical specification** | **Implemented In** |
| 1 | Completed | TokenizeText | removing all the spaces and the breaks in each review. | pre_processing |
| 2 | Completed | Classify Data | Perform Naïve bays to enhance rating system performance | |
| 3 | Completed | LowerCase To All | It take the array of words output and Convert into Lowercase | pre_processing |
| 4 | In Progress | Request Trip | The Tourist requests a Trip sending his/her current location which is sent to Admin | |
| 5 | Completed | lemmatization | It take the array of words output and get the single forms of derived words such as:("students "::"student") | pre_processing |
| 6 | In Progress | View Tourist's rating | The Admin views the rating of the Tourists | |
| 7 | Completed | RemoveStopWords | It takes the array of words output and removes any stopword such as :("as","the","a") | pre_processing |
| 8 | In Progress | Adding a Business Monitor | The admin adds a business monitor record to the database | |
| 9 | Completed | Remove Punctuation | It takes the array of words output and remove Punctuation | pre_processing |
| 10 | In Progress | Editing a Business Monitor's Account | The Admin edits a business monitor's account to the firebase | |

Chapter 4

# Evaluation of the proposed system

## 4.1   Introduction

After the system finishes the implementation process where all the systems' function-alities are implemented, the system should pass through the evaluation process. In this phase, the system is tested through many experiments. The experiments are divided into two different experiments in which the first experiment aims to show a comparison between different algorithms and how we selected the best one, the second one shows how we applied this algorithm in the whole system.

## 4.2   Experiment 1 - Pre-Experiment

### 4.2.1   Setup

Datasets were obtained from ylep , Amzon , booking websites.Then dataset of all the sub-types was divided into test and train data.Different classifiers were tested with the same set of features computed per experiment.

### 4.2.2   Goal

This experiment aims to determine the algorithm that best fits our problem.

### 4.2.3    Results

After testing several algorithms, it was clear that naive bays achieved the best accuracy among all the experiments that were done.

### 4.2.4   Explanation

Naive Bays was the best classifier that fits our classification problem because the archi-tecture that it is based on fits our problem as we have opinion of tourists and users ranged from 1 to 5, 1 is very bad , 5 is excellent.

## 4.3   Experiment 2 - Testing the classifier

### 4.3.1   Setup

Different combinations of features were prepared to be extracted from the text.

### 4.3.2   Goal

This experiment aims to firstly test the classifier performance among different combinations of features and to reduce the confusion between the sub-types of the text to increase the accuracy.

### 4.3.3    Results

After applying different combinations of features on the text, categorising using the selected algorithm which is Naive Bays, the highest accuracy achieved was 81 percent.

### 4.3.4   Explanation

After splitting the text into two categories,then into five categories, it was expected that the accuracy increases as some of the text has similar text combination features which results in similar values of features being extracted affecting the classification process and splitting them will result in decreasing that confusion as each category will be processed separately. This experiment resulted in the first approach in our system.

# Chapter 5

# Appendices

## 5.1 Definitions, Acronyms, Abbreviations

- ArcGIS: a geographic statistics device (GIS) for running with maps and geographic information. It is used for creating maps, gathering geographic data, reading mapped facts, sharing and discovering geographic statistics, the usage of maps and geographic records in a number applications, and coping with geographic information in a database. The gadget presents an infrastructure for making maps and geographic records to be had at some stage in an organization, throughout a community, and openly on the Web.

- GIS: A geographic statistics device (GIS) is a machine designed to capture, store, manipulate, analyze, manage, and present all kinds of geographical information. The key phrase to this technology is Geography – this means that a few part of the data is spatial

- Google maps: Google Maps is a Web-based service that provides detailed information about geographical regions and sites around the world. In addition to conventional road maps, Google Maps offers aerial and satellite views of many places. In some cities, Google Maps offers street views comprising photographs taken from vehicles.

- Semantic analysis: Is the form of reference to syntactic constructs, from the levels of phrases, clauses, sentences and paragraphs to the framework of writing as a whole, to their language-unbiased definitions. This also includes eliminating elements that are unique to different linguistic and cultural contexts, as far as such a project is feasible. Cultural features of idiom and figurative expression in semantic analysis, too, the meanings are often converted into relatively invariant ones. Semantics, while similar to pragmatics, is distinct in that the former deals with the choice of word or phrase in any particular sense, while pragmatics find the unique or common meaning derived from sense or language. Semantics, to put it differently, is about uniformly coded language, and pragmatics the meaning encoded in words that is then interpreted by an audience.

# Chapter 6

# Conclusion

In this document, we've presented the design, improvement and assessment of an tourism system in which it uses Geo information with certain tools, which will greatly improve tourism sector in Egypt.This project aims to exhibit the application of Geo information as a tool for improving the tourism sector by identifying the location of tourist facilities, Services and wildlife habitat locations in order to demonstrate them in a map so that tourists are well informed and directed in what to see and where to go-Tourism is described by the World Tourism Organization as an act of travel for leisure purposes and for the provision of services for that act. This also states that, for leisure purposes, a tourist is someone who travels at least eighty kilometers from home. Tourist will benefit from this application to get fully certified data about national park for free as it is done for an academic purpose also, the application will be available in many interface that will be available for almost all devices to cover the maximum number of users. Application will provide users with feedback's of each park to make sure the tourist get a real feedback for is target national park to choose what he need the most from his trip. Parks in Egypt did not have importance in the past but with everyday technological advancement and the change in the Egyptian economic structure, the government is trying to have good attraction sites in order to increase its income gained from tourism.

## 6.1   Future directions

In the near future, we aim to accomplish an overall functioning Android system for tourists and forgien vistiors of Egypt.

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