



WOLKITE UNIVERSITY

COLLEGE OF COMPUTING AND INFORMATICS

DEPARTMENT OF INFORMATION TECHNOLOGY

**PROJECT TITLE: -ANDROID BASED TOURISM GUIDE APPLICATION
FOR GURAGE ZONE**

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WOLKITE UNIVERSITY, WOLKITE, ETHIOPIA

AUGUST, 2021 G.C

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SUBMITTED TO DEPARTEMENT OF INFORMATION TECHNOLOGY IN
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DECLARATION

This is to declare that this project work which is done under the supervision of Mr. Fuad Yimer and having the title” **ANDROID BASED TOURISM GUIDE APPLICATION FOR GURAGE ZONE**” is the sole contribution of:

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Abstract

Gurage zone is one of the zones found in SNNRP region Ethiopia which have a great potential of tourism. For so long and still tourism attraction sites in Gurage zone have not been promoted enough. Due to lack of updated information, tourists are not able to visit all tourist sites found in this zone. Lack of technology like mobile application decrease accessibility of information. Aim of this project is replace existing way of tour guide by providing information to tourists.

CHAPTER ONE

1. INTRODUCTION

In today's society smart phones have become so popular that it is hard to imagine life without them since it simplifies our daily operations. And those smart phone technologies can have very important implication in the tourism sector and tourism is one of the application areas of smart phones now a day.

Ethiopia is a country with diverse physical and cultural resources which can provide excellent opportunities for the development of tourism. But the tourism sector in our country not developed well to benefit from it. It doesn't integrate with technology in this era of technologies which can help to attract many international tourists.

Now a day's tourist who travels around the world prefers to know and get some awareness about their destination tourism areas before they begin to travel. To solve this problem tour guide mobile application is beginning to be developed in many other countries which make tourists curious before they come to see within their eye.

As ato Ketema Alemu (Tourism sector coordinator in Gurage Zone tourism and cultural bureau) said "In Ethiopia there is no such type of technology which guides international and national tourists by using their phone which want visit our country". Our proposed system is aims at solving this big obstacle of tourism sector to Gurage zone which has a lot cultural, natural, historical tourism sites that are cannot be counted and finished.

The oldest way of tour guidance which is manual guide not suitable for tourist come to SNNRP and Gurage zone because there is no system that guide the tourist come to this area and also there is no tourist guidance agent according to Gurage zone as an information we get from Gurage zone cultural and tourism office but there are so many tourist sites in this zone that tell about beauties of the zone. There are no tour agents who arrange travel events for tourists want to visit this zone.

So, this project is focuses on developing Tourism guide application that help tourist to get full information about their destination tourism sites. In attractive way it gives information about historical, cultural, natural and another tourist area found in this zone and locate and give full

information about nearby hotels for tourists. In addition, tour events were created by tour agents and any tourist can join the event by making payment to the tour agent using the proposed system.

1.2. Problem statement

Currently tourists have been facing a problem of accessing tourist sites in SNNPR and Gurage zone. Both national and international tourists have less awareness of tourism sites that found in this region and Gurage zone. There is no technology which illustrate about the beauties and attractiveness of both the region and Gurage zone. In addition, tourists have been in trouble during their travel because there is fake tourist sites that are not approved by the government.

Tourist sites are advertised on newspaper, magazines and sometimes on websites this means there is no organized tourists sites information and need to spent money for the advertisement. And also there are no tour agents who arrange travelling events (with transportation) to different place of this zone for tourists want to visit. The other problem is tourists are not able to get up to date information about nearby hotels which tourists can lay in during their travel. This problem can be proven by the tour agent because his/her responsibility is arranging travel events with hotel reservation, transportation and other services also.

For international tourists it's difficult to gate organized tourist site information and linguistic communication problems during their visit in this zone in English language. Communication is the main thing in visiting so for foreign tourists difficult to understand our local language.

In addition, there is a lot of place which is not well known and can attract national and international investors to invest and develop the place which can attract a lot of tourists. This also can help the society around that place by creating job opportunities.

Generally, our proposed mobile application has solution to all problems mentioned above by providing android based mobile application that has all tourist sites (cultural, natural, historical) with full of their information and their image which can attract tourists to come and visit the region and Gurage zone. And different tour agents create tour events and tourists can join the event and make payment to the event through our proposed mobile application. Our application makes them curious to come and visit our region.

1.3. Objective of the project

1.3.1. General objective

The general objective of this project is to develop Android Based Tourist Guide Application for Gurage zone.

1.3.2. Specific objectives

- To study and analyze tourism sites found in Gurage zone.
- To analyze and identify what kind of problem faced by tourists and tourism sector in Gurage zone.
- To design android based tourist guide mobile application.
- To implement the designed application.
- To test the mobile application.

1.4. Feasibility study

The feasibility study is the preliminary study that determine whether a proposed mobile application is financially, technically, operationally and politically feasible.

1.4.1. Economic feasibility

Our system is economically feasible, because it reduces time that spend in fake tourist sites and payment made to those places by providing accurate information of tourist sites that is found in the region and Gurage zone.

1.4.2. Technical feasibility

Our system is technically feasible due to the following reason: -

- Developed within latest technology.
- Easy and understandable.
- Can be adapted by users easily.

Generally, our system is technically feasible, because it would be developed with easy user interface.

1.4.3. Operational feasibility

The proposed mobile application provides best service for tourists. The application is on behalf of tourist's satisfaction because the application is possible to use wherever we are and anywhere.

User can use the application easily since it is not confusing, and wherever they are since mobiles are convenient to carry.

1.4.4. Political feasibility

The system to be developed is not conflict with any government directives, because it gives services for the tourists, government and society effectively and efficiently. The government is profitable and the application will be politically feasible.

1.5. Scope and limitation of project

1.5.1. Scope of project

This project focused on developing android based tourist guide. The scope of this project is include only known and approved tourist areas and nearby hotels and their detail information that are found in Gurage zone and it also help as a prototype to apply to all the tourism sites of SNNPR.

The main goal of our proposed project is to help the tourists to travel on their own and take full advantage of the visit without missing the main attraction places.

Our mobile application has admin section where the admin can add and update the information's and developed in web while users can only view the data on each place. In addition, there is a tour agent who creates and arranges different tour events for visitors. There is also guest tourist. Among the feature of our project some are: -

- Location of different tourist sites.
- Nearby hotels with their information.
- The detail information (text, image) of tourist sites according to their category (cultural, natural, historical).
- Nearby gas station.
- Special event found in Gurage zone.
- Generate statistic report for the visited sites (which site is visited most among others).
- Create tour events.
- Join tour events.
- Leave tour event.

1.5.2. Limitation of the project

- Android user only can use this system.

1.6. Significance of the project

We all agree the fact that the technology solving the problem existing in all situation therefore we must improve the technology to solve and change our life style because world can improve many systems to simplified human works and power by suing technology.

- It helps the tourism office by reducing cost of promotion spent for the sites.
- It helps tourists to find attractive tourists areas easily.
- It helps tourists to find hotels easily.

1.7. Beneficiary of project

The proposed mobile application provides many benefits. The targeted beneficiaries are: -

Beneficiary for tourist/visitors

- It will guide them and it will be easy to get tourist sites to be visited.
- Learn about the cultural and heritage of the zone.
- Easy to get hotel to be rest in.
- It may increase the interest of visitors to invest in this zone.

Beneficiary for tour agent

- They don't have to rent for office they can work from their home.
- They become happy and get satisfaction by sharing what they knowing.
- Help them to make personal relationship with people around the tourism sites.
- Getting paid for their work.
- Sometimes they can get tip from the tourists.

Beneficiary for Gurage zone tourism office

- To increase flow of tourist.
- To get more income from this sector and to reduce cost of advertise.
- To works in modernized way.

Beneficiary for the developer

- Developers get knowledge.
- Get financial benefit by selling the system.
- Get moral satisfaction by increasing tourist flow of the zone.

1.8. Methodology of project

In order to accomplish this project on time and within the cost we follow different procedures which are described below.

1.8.1. Data collection methodology

In order to gather the relevant data, we use both primary and secondary way of data collection.

Primary Data Collection:

- Interviewing- the team member gather information about the existing system by interviewing responsible body in cultural and tourism office of Gurage zone (Ato Ketema Alemu) after arranging what we want to ask and it enables us to understand and how currently tourism guidance operate, list out the problems.

Secondary Data Collection

- Document analysis- For having sufficient information for our project we use different documents as a reference for developing this project.

1.8.2. System Development methodology

For developing our system, we will use Iterative model. We preferred Iterative model approach for the following reasons:

- It is more cost effective to change the scope of the requirements in Iterative model.

- Best for application development
- Testing and debugging during smaller iteration is easy.
- Risks are identified and resolved during iteration.

1.9 System development tools and technologies

In order to develop this project different system development tools will be used.

1.9.1. Hardware tools

The hardware requirements to develop the system are: -

- ✓ Computer-used to write the proposal, documentation and develop the system. It has the following specification: -
 - Processor-Intel(R) Core(TM) i5-4300M CPU @ 2.60GHz
 - RAM-8 GB
 - Hard Disk Drive-931 GB
- ✓ Flash: used to store data.
- ✓ Printer: used to print document.
- ✓ Stationeries (pen, papers, note book): used for writing all necessary documentation associated with the project and to take notes during data collection.

1.9.2. Software tools

- MS office 2013: used for writing proposal and documentation of the project.
- Android sdk: used for developing and test the application.
- Flutter sdk
- Edrawmax: used for designing project.
- Django framework
- Python

1.9.3. Programming language

Front end technologies

- Java for android development
- Python

- Bootstrap and CSS for styling user interface.
- Django framework.
- Flutter sdk.

Back end technologies

- Django framework
- Java for android development
- PostgreSQL database
- HTML

CHAPTER TWO

2. DESCRIPTION OF EXISTING SYSTEM

2.1. Overview of existing system

Currently tourism sites are introduced through websites, newspaper, magazines radio and other simple ways and mainly used for promotion purpose. The problem is that those ways not provide full guidance information for tourists. The other problem is tourists can't get information when they are in move; they are not able to get travel information on a timely basis.

The existing tourist guiding way is so difficult. If one tourist wants visit sites he/she have to find tour agents to guide them during their travel. But currently in Gurage zone there is no tour agents. So that tourists come with tour agents which found in our country capital city Addis Ababa by hiring them. During this process they must spent money to the tour agents to get all necessary services.

Another way is tourists go to the place by their self and in each site there are local tour mans who provide assistance to the tourists by giving information about the sites. The big problem now is for international tourists those local tours mans can't provide information with their preferable language, so that visitors have to come with language translator.

As a result of all these visitors can't make decision objectively and can't understand and get awareness of the sites before deciding to visit attractive tourist sites that are available to be visited by tourists. Generally, availability is the big obstacle and also there is no up-to-date information due to this tourist is not able to visit all the attraction during their visit.

2.2. User of existing system

Users are actors that interact and participate with the system. Here are the users those are involved in the existing system.

- Tourists: -visitors of different tourism sites found in Gurage zone.
- Tour agent: -a person who's responsible for arranging travel for tourists (transportation, hotels, car rental). They are licensed and educated.

- Cultural and tourism bureau: -responsible for licensing and supervising facilities for tourists.
- Local Tour mans: -they are local people who provide assistance by giving information about visited sites to the visitors.

2.3. Major function of the existing system

In current system information are provided to the tourist through internet (websites, face book...), magazines, newspaper and sometimes radio. All this isn't sufficient and efficient in providing up to date information of all sites. Because not all attractive tourists' sites are posted in the above way of promoting this zone tourists site whereas there is a lot of sites to be visited. To get full information about the all sites visitors must go to tourism office physically. Currently in Gurage zone list of all available sites are organized in this way.

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2	መገራት ገንዘብ	ተፈጥሮአዊ	>>	መገራት	የባህር	77	23	3	መገራት ላይ	ገንዘብ	ገንዘብ በጣም ትላልቅ ዘዴች ገንዘብ ቅርሶች ገንዘብ ገንዘብ ያለው
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Figure 2. 1: Gurage zone tourist sites information

2.4. Drawback of existing system

Gurage zone tourism guiding system is not suitable for tourists especially for international tourists. Since the sites are listed as we see above (in Amharic language) and international tourist can't understand and make decision which place to visit to get awareness and motivation before they begin their travel. Also in Gurage zone currently there is no tour operator which help the tourists in activities like finding hotels, finding transportation ...etc. because of this visitor has no longer want to visit this zone. And also in the current way of providing sites information to visitors not all sites are promoted as well. And also visitors can't get organized information they need on time. All activities tourism office of this zone done now is limited to promoting sites only there is no organized instruction of how to get the location of sites this also the big drawback of current system. However, it's better to integrate tourism sector activities to current available technologies.

2.5. Business rule of the existing system

This section specifies and gives understanding of activities which are done in existing system in terms of business rule.

BR1: Tourist/visitors first have to know come with tour agents from Addis Ababa because currently there is no tour agent found in this zone and go to the sites under the guidance of the tour agent.

BR2: Tourists/visitors come to the place by their self and get local tour man's found in the sites.

BR3: International tourists have to come with language translator because local tour mans can't provide sites information with their preferable language for tourists they are not well educated persons.

BR4: Many times tourist come to visit this zone sites came without plan to trip they visit place in incident means for example Mr. x came to this zone for another reason may be for work or ...etc. then incidentally visit places.

BR5: Visitors came to place they want to visit with manual instruction of where the sites locate, may be they get from another person or may from internet.

BR6: To join tour events tourists have to make payment from their bank account created on the database.

BR7: To create tour events the tour agent must login as a tour agent.

BR8: To create tour event tour agent must have an account.

CHAPTER 3

3. PROPOSED SYSTEM

After analyzing the current system and identifying the problems faced by tourists, our project team decides to develop android based tourism guide application for Gurage zone. Our new project will solve the problem of current system we seen above. Our proposed project will use the major functionality of the existing way of tourism guide and able to advance and integrate it with technology in order to attract more tourists to the zone. The proposed system will be efficient with respect to current way of tourism guide with android mobile device.

3.1. Requirement specification

In requirement specification there are two main ideas defined functional requirement (what things are performed by the system that we developing) and non-functional (what are system aspects). So, it consists of two parts (Functional Requirement and Non-functional Requirement).

3.1.1. Functional requirement

Functional requirements are those that refer to the functionality of the mobile application. Generally, it's the interaction between the system and the users. The functionality of our application is: -

For admin: -

- Login as admin.
- The system allows the admin manages user account.
- The system allows the admin to add tour agent.
- The system allows the admin to add tourist site.
- The system allows the admin to add hotels.

- System allows the admin to add special events.
- The system allows the admin to add gas stations.
- The system allows the admin to generate virtual statistical report of sites

For user (tourists): -

- The system enables tourists to register to system
- The system enables tourists to Login to the system.
- The system enables the tourists to view tourist's sites with description.
- The system enables the tourists to view nearby hotels with their description.
- The system enables the tourists to view nearby gas stations.
- The system enables the tourists to trace locations from their current location.
- The system enables the tourists to join tour events created by tour agent.
- The system enables the tourists to make payment.
- The system enables the tourists to give feedback.

For tour agent: -

- The system enables tour agent to login as a tour agent.
- The system enables tour agent to create tour event.
- The system enables tour agent to view tour participants.
- The system enables tour agent to receive payment of tour events.

3.1.2. Non-functional requirements

Non-functional (supplementary) requirements relevant to other information needed to produce the correct system and detailed separately. This requirement is related with how the system does.

- **Usability:** our system is user friendly which is easy to use and operate. The user interface of our project is easy and clear.
- **Security:** security is a crucial issue in the proposed system. User (tourists) must login to the system to access it. The system should only allow login for registered user only.
- **Easy accessibility:** the application is easily accessible for tourists to give information wherever they are within their hand held mobile device.

- **Performance:** our mobile application is going to use in efficient way for each task. The proposed mobile application would have should response time.
- **Authorization and Authentication:** The proposed system authenticates the user and provides authorization facilities by asking username and password and determining whether a user is authorized to access a resource
- **Availability:** The system is available at any time to give information to tourists in timely basis. So, the users of system can access the system successfully.

3.2. User Interface and Human Factors

This works as an interface between the user and the tour guide mobile application by properly guiding the user how to use it and perform operations. It will include the necessary features for each user with a user friendly and attractive interface.

3.3. Hardware Consideration

Our proposed system will be developed by considering the hardware requirement. The proposed system will support smartphone and computer to provide the desired service. The proposed mobile application will be portable in android platform for 4.1 and above versions and GPS supporter hand held mobile devices.

3.4. Security Issues

The systems contain a user name and password for each user based on their privilege. This performs the following activity:

- An authenticated user with predefined access right that will only enter the information stored into database. User should use strong passwords. To be the password strong the system allows the password to include numbers, special characters and letters.
- The user must enter a valid username and password to login to the system. Without this access to the system is denied.
- To prevent credential data like password not only viewed by anyone so, the system will encrypt data or information using Enhanced message digest (MD) 5 hashing algorithm because it doesn't need any key and easy to implement.

3.5. Performance Consideration

Since the mobile application is going to be accessed by different users with different needs, it should be capable of handling and processing their queries quickly. One of measurement of performance in application development is its availability. The system will not have any performance problem because it will be developed based on the requirements. In addition to this the proposed mobile application is will be accessed by smart mobile device with all screen sizes. Generally, mobile application should be able to handle many users and it will be responsive.

3.6. Error Handling and Validation

The mobile application is expected to handle errors encountered during run time. Errors could arise from users and the system. Errors that occurred from the wrongdoing of users will be handled by appropriate exception handling mechanisms. Generally, if an error occurs, the system will identify the error and notify the user so that he/she can take the appropriate corrections and the system must handle the error and should display an error message if the user inputted the characters that are mismatched to corresponding data types.

3.7. Quality Issues

Availability: The proposed mobile application should have to be functional at any given time and place. Our proposed system will also be accessed offline so that user can use it anytime and anywhere they are.

Reliability: The proposed mobile application will minimize crash during its runtime since more than one user could use the system simultaneously. To increase our system reliability our team will use better development process and configuration management.

3.8. Backup and Recovery

In terms of backup and recovery we will use two databases to store data in offline environment prevent data lose. So that user can access data whenever they want. Rather than this today in android device there is automatic backup of data provided by Google back up service.

3.9. Physical Environment

Our proposed mobile application is android based then it deployed on the android platform.

3.10. Documentation

The documentation is one of the non-functional requirement in which the mobile application will have a document to help the user to the system by prepare help button. In help Prepare short and precise help file on how to use the mobile application for the users.

CHAPTER FOUR

4. SYSTEM ANALAYSIS

In this chapter we will deal with the proposed system by using use case diagrams, use case description, object model, dynamic model (sequence diagram and activity diagrams). After identifying the actors and the use case of our new system, the use case is developed and textual descriptions are depicted based on the use case. Next the sequence diagram will be depicted based on the use cases which are developed for the newly proposed system. Activities will be represented by activity diagram. Precondition, post condition and flow of event will be covered under this chapter.

4.1. System Model

In system model we have use different system models such as use case model, object model, dynamic model, that describe problem to be solved and system model represent graphically they are more understandable than more detail description of the system requirements.

4.1.1. Use case model

Use case model is composed of a use case diagram and the documentation describing the use case, actors, and associations. Use case diagram is created to visualize interaction between systems with the external environment. Also a use case model is the representation of the system intended functions and its environment. The functionalities are specified by the use case and the actor specified for the environment.

4.1.2. Actor and Use Case Identification

Use case: It's the identification and representation of a sequence of actions that the user (Actors) takes for a system to get particular target. It can be identified and represented by ellipses with a respective descriptive name.

Actors: An actor represents a type of users of the system that the system interacts with. The project team identified the following actors:

- User(Tourists):-are users who register and has an account use the proposed mobile to view the information and
- Admin (tourism office): - is responsible to perform all activities about the application and maintain the database environment
- Tour agent: -is a person who arranges different travel and manage travel related event in Gurage zone.

4.1.3. Use case identification

Identifying the activities that are mainly performed on the proposed system is the basic thing in analyzing new system. The following use case cases have been identified from the system specification.

- Splash screen (start page)
- Register/Login
- Tourists sites (cultural, historical, natural)
- Nearby Hotels
- Special events
- Create tour
- Join tour
- Payment
- View tour information
- Trace Location on map
- Statistical report of sites
- Feed back

4.1.4. Use case diagram

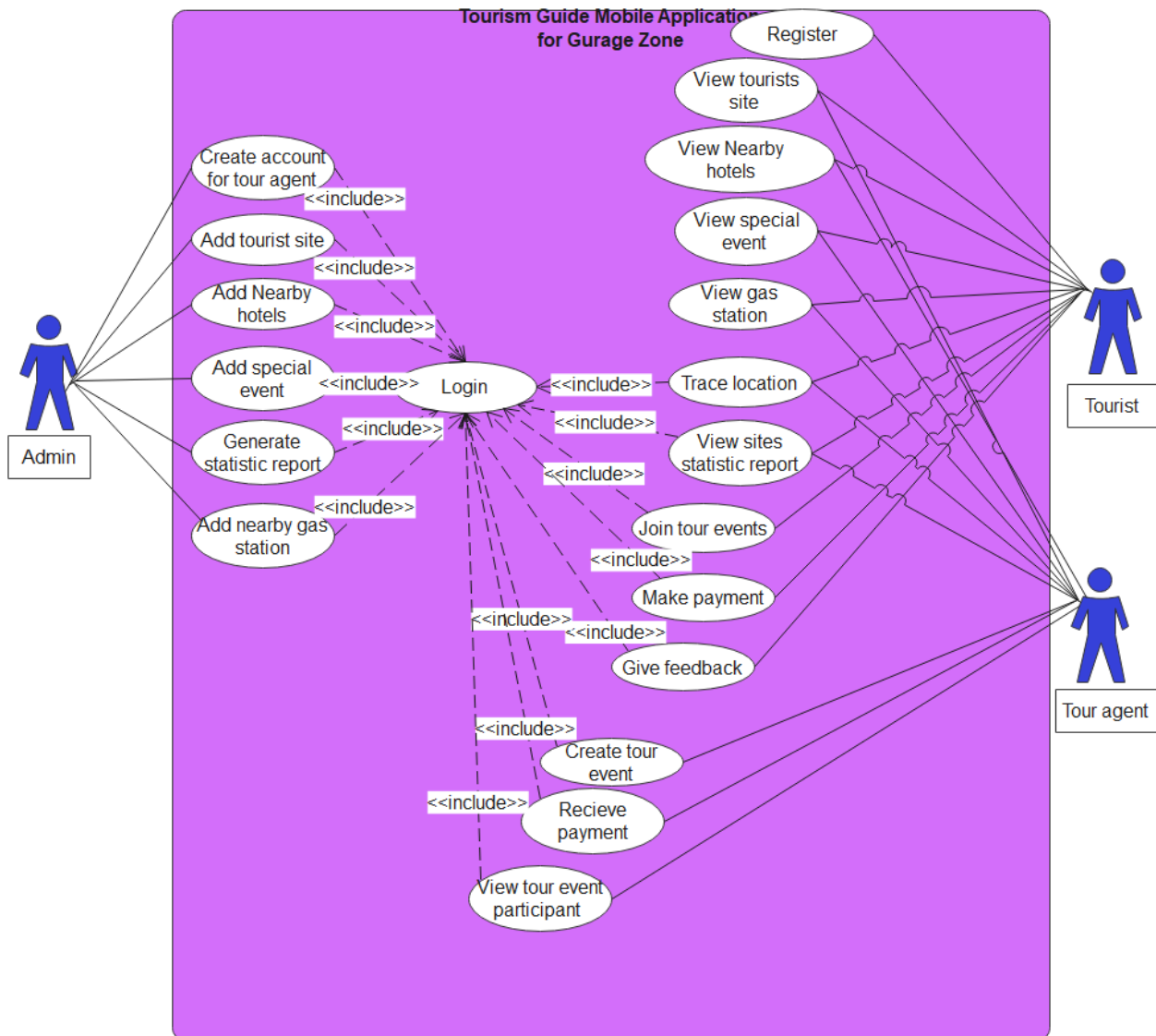


Figure 4. 1: Use case diagram

4.1.5. Use case descriptions

Use case description is documents that contain brief information about use case. Use case description contain the components like use case name, use case ID, participate actor, description, basic course of action, alternative course of action, pre-condition and post condition Of one use case how to perform by the give actors.

Table 4. 1: Register use case description

Use case name	Register	
Use case ID	UC-1	
Actors	Tourists	
Description	Describes how the users register to use the application	
Pre-condition	Users must have to register with username and password to use the app.	
Post-condition	Registered user has account	
Basic course of action	Actor action	System response
	<p>Step1: the user is open the application</p> <p>Step3: the user clicks the create account button</p> <p>Step5:the user fill the form and click on register button</p>	<p>Step2: the system displays the splash screen and login page</p> <p>Step4: the system displays the registration form</p> <p>Step6: the system returns registered successful message</p> <p>Step7:end of use case</p>
Alternative course of action	Actor action	System action
	<p>Step1: if the user input information invalid or empty</p> <p>Step3:if the user has not account but click the login button</p>	<p>Step2: the system returns error message</p> <p>Step4: the system return not register message then immediately display create new account form</p>

Table 4. 2: Login Use case description

Use case name	Login	
Use case ID	UC-2	
Actors	Tourists(user)	
Description	Describes how the users login into the mobile app.	
Pre-condition	Users must have user name and password.	
Post-condition	Login to the app successfully and gets access to the app according to their predefined privileges.	
Basic course of action	Actor action	System response
	Step1: the user opens the application Step3:the user enter user name and password	Step2: the system displays splash screen then login page Step4: the system checks the validity of name and password and display home page Step5: end of use case
Alternative course of action	Actor action	System response
	Step3.1:if the user enter invalid user name or password	Step4.1: the system return invalid user name or password message

Table 4. 3: Login use case description for the admin

Use case name	Login
Use case ID	UC-3
Actors	Admin
Description	Describes how the admin login into the system.
Pre-condition	Admin must have admin name and password.
Post-condition	Login to the system successfully and gets access to the system

Basic course of action	Actor action	System response
	Step1: the admin opens the website Step3:the admin enter user name and password	Step2: the system displays login page Step4: the system checks the validity of name and password and display home page Step5: end of use case
Alternative course of action	Actor action	System response
	Step3.1:if the admin enter invalid user name or password	Step4.1: the system return invalid user name or password message

Table 4. 4: Login use case description for the tour agent

Use case name	Login	
Use case ID	UC-4	
Actors	Tour agent	
Description	Describes how the tour agent login into the system.	
Pre-condition	Tour agent must have admin name and password.	
Post-condition	Login to the system successfully and gets access to the system	
Basic course of action	Actor action	System response
	Step1: the tour agent opens the application Step3:the tour agent select tour agent check box then enter user name and password	Step2: the system displays splash screen then login page Step4: the system checks the validity of name and password and display home page for the tour agent Step5: end of use case
Alternative course of action	Actor action	System response

	Step3.1:if the admin enter invalid user name or password	Step4.1: the system return invalid user name or password message
--	--	--

Table 4. 5:View tourist site use case description

Use Case Name	Tourist sites	
Use case ID	UC-5	
Actors	Tourists	
Description	It allows the tourists to see all the attractive sites of Gurage zone with their category and full description	
Pre-condition	The tourists has an account	
Post-condition	The tourists is registered to the database and can access the application	
Basic course of action	Actor action	System response
	Step1: the user opens the application Step3: the user login Step5:the user click the tourist site button	Step2: the system displays splash screen then login page Step4: the system displays home page Step6: the system display all site with their description

Table 4. 6: View nearby hotel description

Use Case Name	Nearby Hotels	
Use case ID	UC-6	
Actors	Tourists(user)	
Description	It allows the tourists to see all the nearby hotels and full description.	
Pre-condition	The tourist has an account.	
Post-condition	The tourists is registered to the database	
Basic course of action	Actor action	System display
	Step1: the user opens the application Step3: the user login Step5:the user click the hotels button	Step2: the system displays splash screen then login page Step4: the system displays home page Step6: the system display all hotels with their description

Table 4. 7: Special event use case description

Use Case Name	Special events	
Use case ID	UC-7	
Actors	Tourists(user)	
Description	It allows the tourists to see all the nearby hotels and full description.	
Pre-condition	The tourist has an account.	
Post-condition	The tourists is registered to the database	
Basic course of action	Actor action	System response
	Step1: the user opens the application Step3: the user login Step5:the user click the special event button	Step2: the system displays splash screen then login page Step4: the system displays home page

		Step6: the system display all special event with their description
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Table 4. 8: Join tour event use case description

Use case name	Join tour	
Use case ID	UC-8	
Actors	User (tourist)	
Description	Describes how the tourist join tour event	
Pre-condition	user must login to the application	
Post-condition	the user join tour and view tour information	
Basic course of action	Actor action	System response
	Step1: the user login to the system Step3:the user click on tour events button	Step2: the system displays home page Step4: the system displays tour event page Step5: end of use case
	Step3.1:if the admin enter invalid user name or password	Step4.1: the system return invalid user name or password message

Table 4. 9:Create tour use case description

Use case name	Create tour	
Use case ID	UC-9	
Actors	Tour agent	
Description	Describes how the tour agents create tour events.	
Pre-condition	The tour agent must login as a tour agent.	
Post-condition	Tour created	
Basic course of action	Actor action	System response
	Step1:the tour agent login Step3:the tour agent click on create tour events button	Step2: the system displays home page Step4: the system displays the tour events page Step5: end of use case
Alternative course of action	Actor action	System response
	Step3.1:if the admin enter invalid user name or password	Step4.1: the system return invalid user name or password message

Table 4. 10:Payment use case description

Use case name	Payment	
Use case ID	UC-10	
Actors	Tourist	
Description	Describes how the tourist make payment to join tour event	
Pre-condition	The tourist must has account and in database has money	
Post-condition	Tourist join tour and make payment	
Basic course of action	Actor action	System response

	<p>Step1: the tourist clicks join tour event button</p> <p>Step3:the tourist fill the form and submit</p>	<p>Step2: the system displays payment form</p> <p>Step4: the system return payment approved message</p> <p>Step5: end of use case</p>
Alternative course of action	Actor action	System response
	Step3.1:if the tourist enter invalid pin	Step4.1: the system return invalid pin message

4.1.6 Use case scenario

Scenario are an instance of a use case explaining a concrete major set of action scenario or use case realization are just a sequential narrative description of events or an instance of a use case.

1. Scenario name: login

- Mr X want to login in to the system.
- First open the application then the system displays splash screen after few second then display login page.
- Then Mr X enter the user name and its password then click on login button
- If Mr X has a valid account, the display authorized home page else error message return to Mr X.

2. Scenario name view tourist site

- Mr X login to the system.
- Enter user name and password.
- Home page displayed.
- Then Mr X clicks on tourist’s site button.
- Then site information displayed to Mr X.

3. Scenario name: create tour event

- Tour agent wants to create tour event.
- First tour agent login by its account.
- Then the system displays home page.
- Then tour agent clicks on create tour button.
- Create tour event page displayed.
- Then the tour agent fill information about the tour event the click create button.
- Then the system returns created message.

4. Scenario name: join tour event

- Mr. X wants to join tour event.
- First Mr x have to login by its account.
- Then the system displays home page.
- Then Mr. X clicks on tour event page and view the event created by tour agent.
- The Mr. X select and click on join events then the system return Mr. X joined successful message.

5. Scenario name: payment for tour event

- Mr. X wants to pay for tour event.
- First Mr. X must join tour event then the system displays payment form.
- Then Mr. X fill the form and the system can decrease from its account and send a message Mr. X paying successfully.

4.1.3 Data Dictionary

Table 4. 11: Data dictionary for admin

Field	Data type	Size	Key constraint
ID	Int	(50)	Primary Key

Username	Varchar	(50)	Not null
Password	Varchar	(50)	Not null

Table 4. 12: Data dictionary for tour agent

Field	Data type	Size	Key constraint
ID	Int	(50)	Primary Key
Agentfname	Varchar	(50)	Not null
Phone	Varchar	(50)	Not null
Username	Varchar	(50)	Not null
Password	Varchar	(50)	Not null

Table 4. 13: Data dictionary for tourist

Field	Data type	Size	Key constraint
ID	Int	(50)	Primary Key
Touristfname	Varchar	(50)	Not null
account no	Int	(50)	Not null
Username	Varchar	(50)	Not null
Password	Varchar	(50)	Not null

4.2 Dynamic model

The dynamic model is concerned with the temporal changes in the states of the objects in a system. In this section we describe the behavior of the object model in terms of sequence and activity diagram.

4.2.1 Sequence diagram

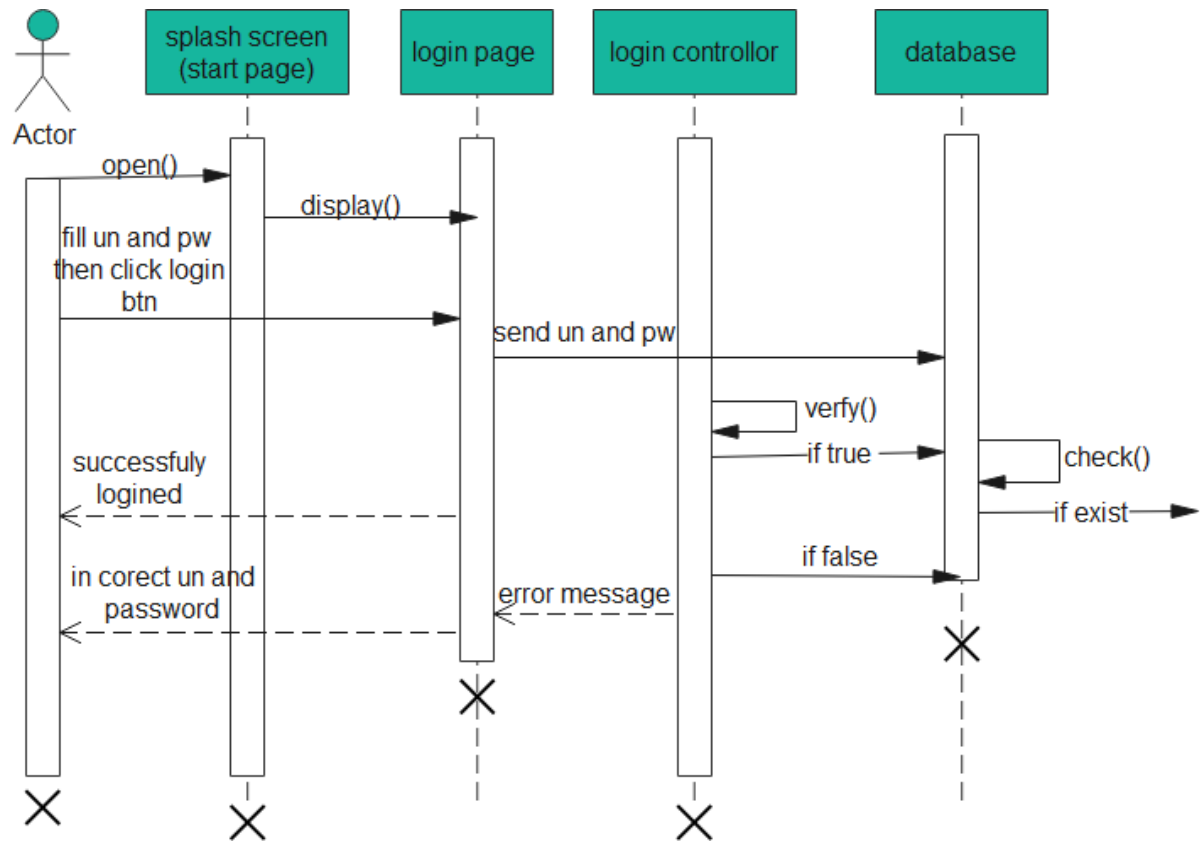


Figure 4. 2: Login sequence diagram

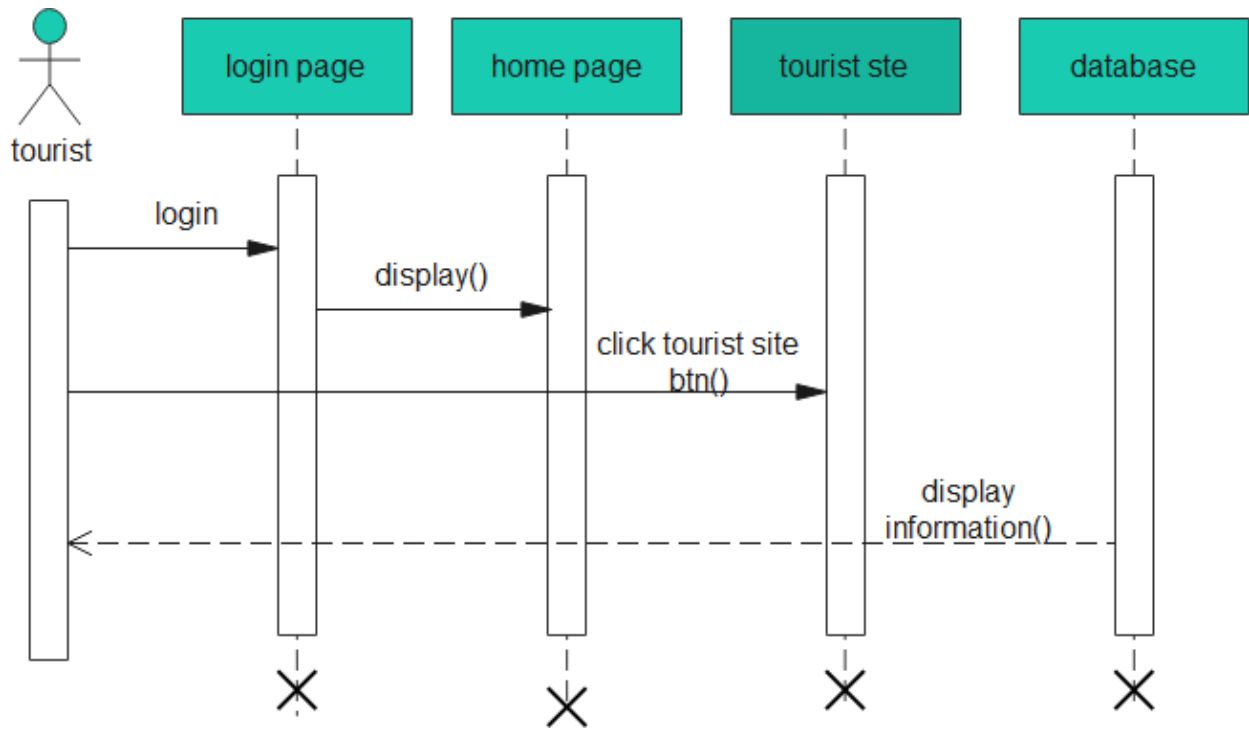


Figure 4. 3: Tourists site sequence diagram

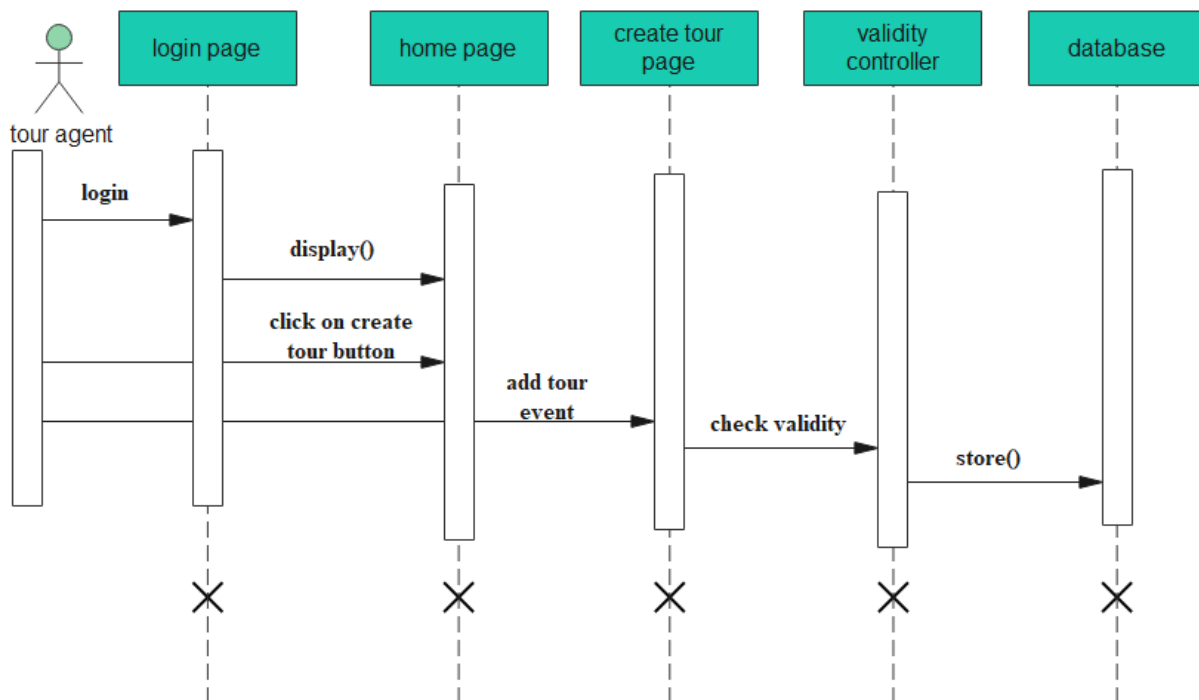


Figure 4. 4: Create tour sequence diagram

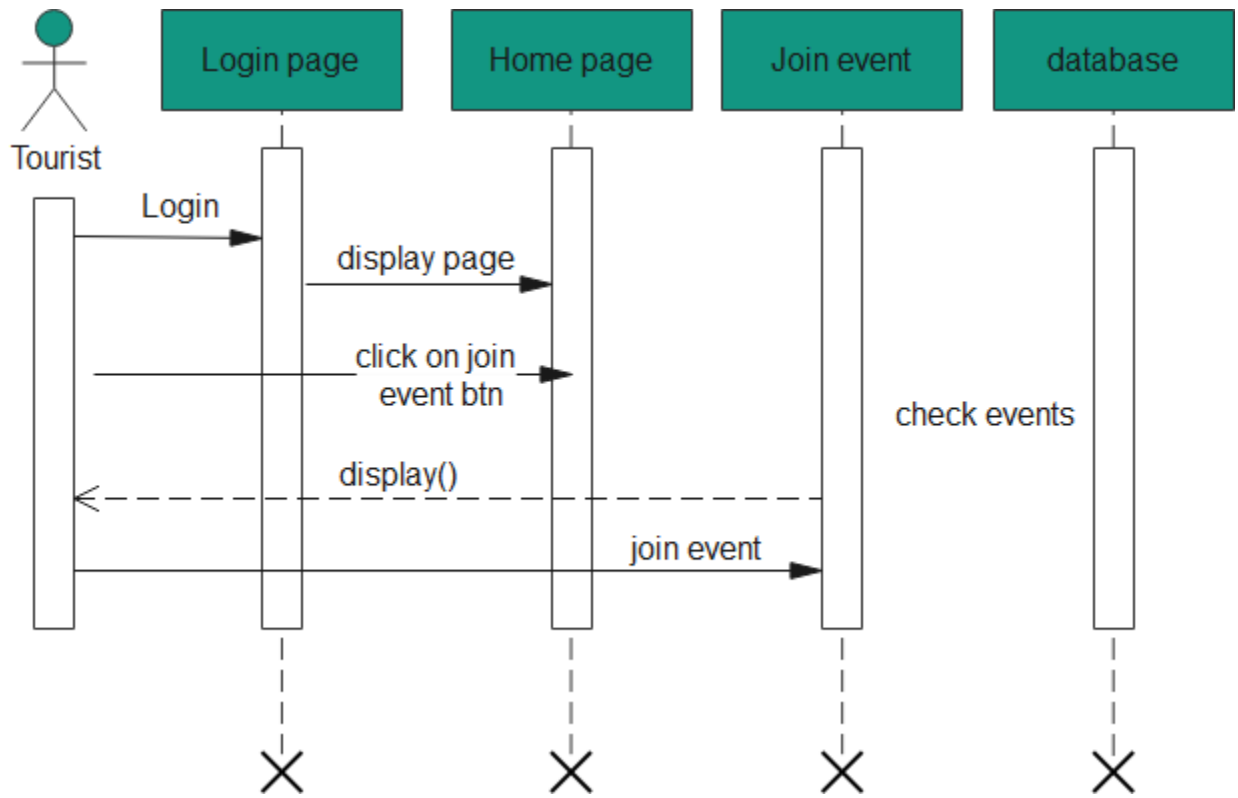


Figure 4. 5: Join event sequence diagram

4.2.2 Activity diagram

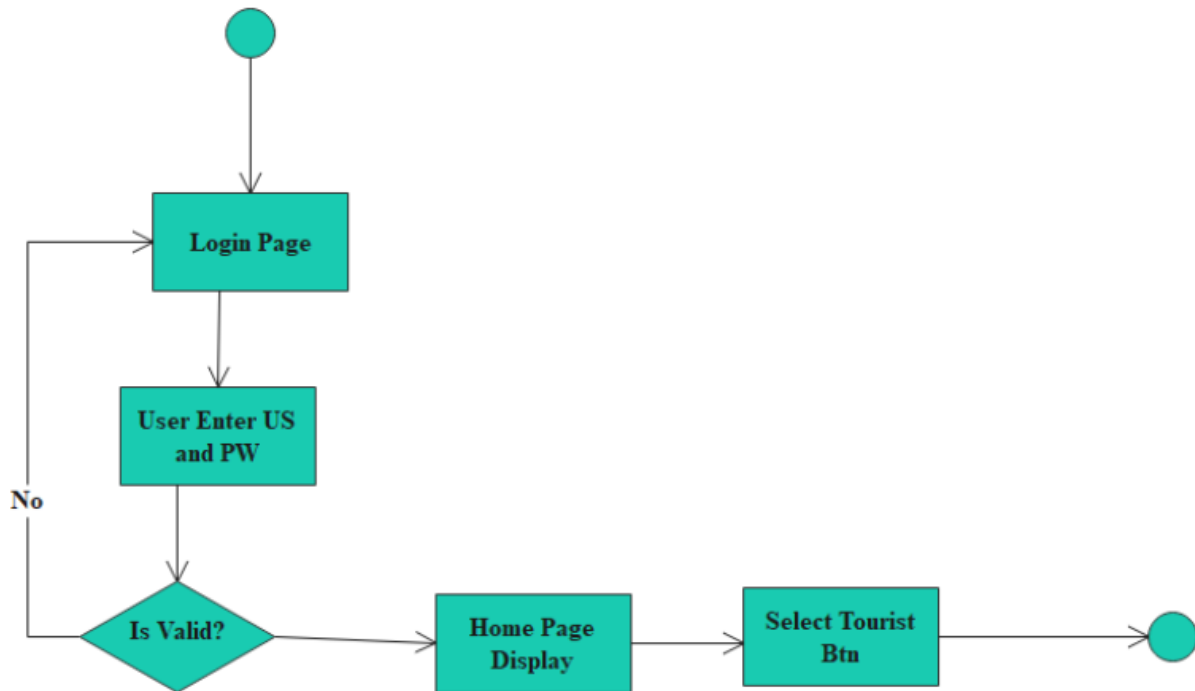


Figure 4. 6: Login activity diagram

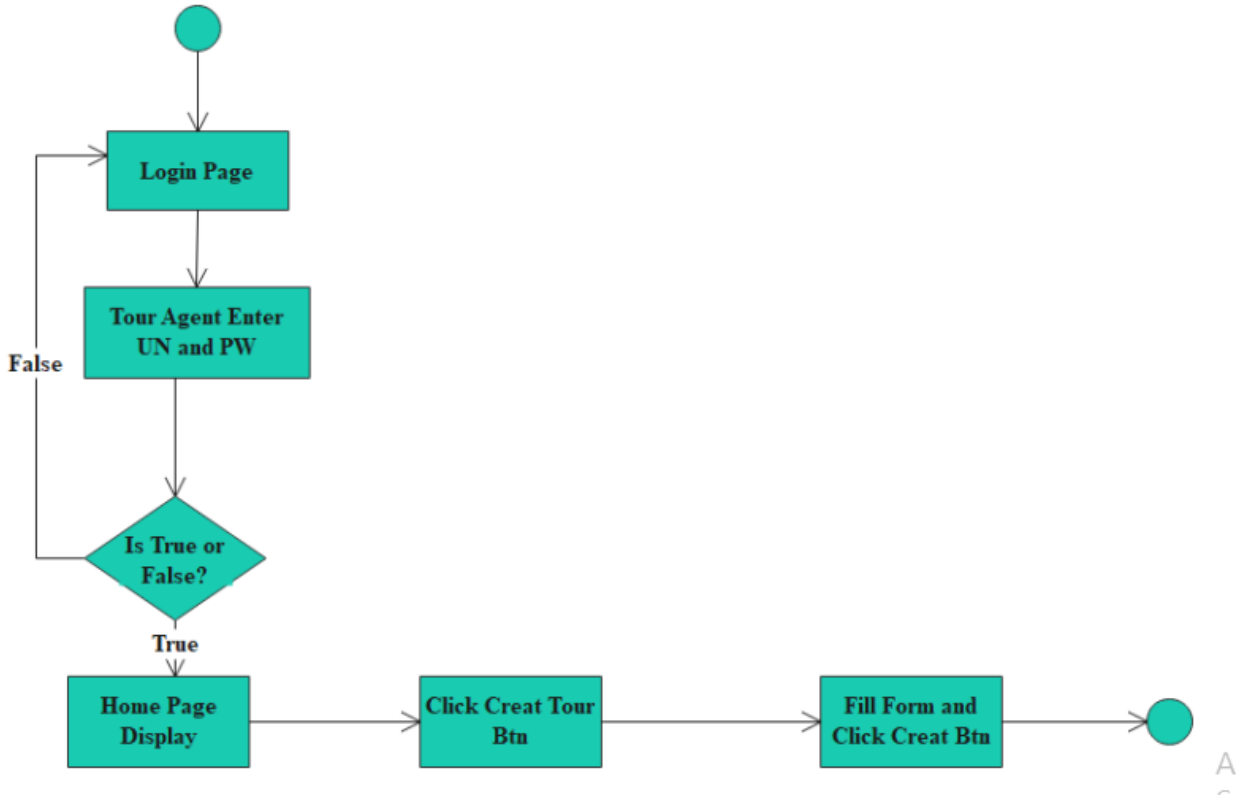


Figure 4. 7: Activity diagram for Create tour

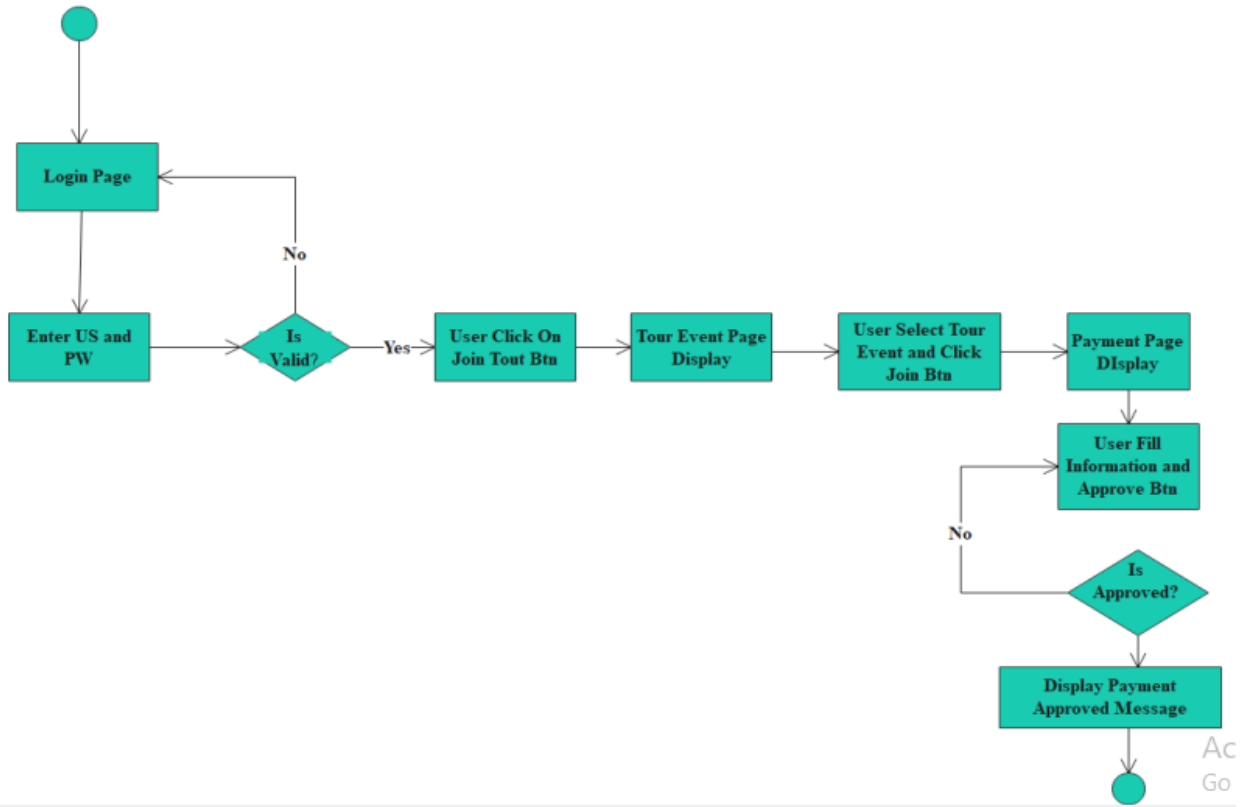


Figure 4. 8: Activity diagram to join tour event

4.3.3. State chart diagram

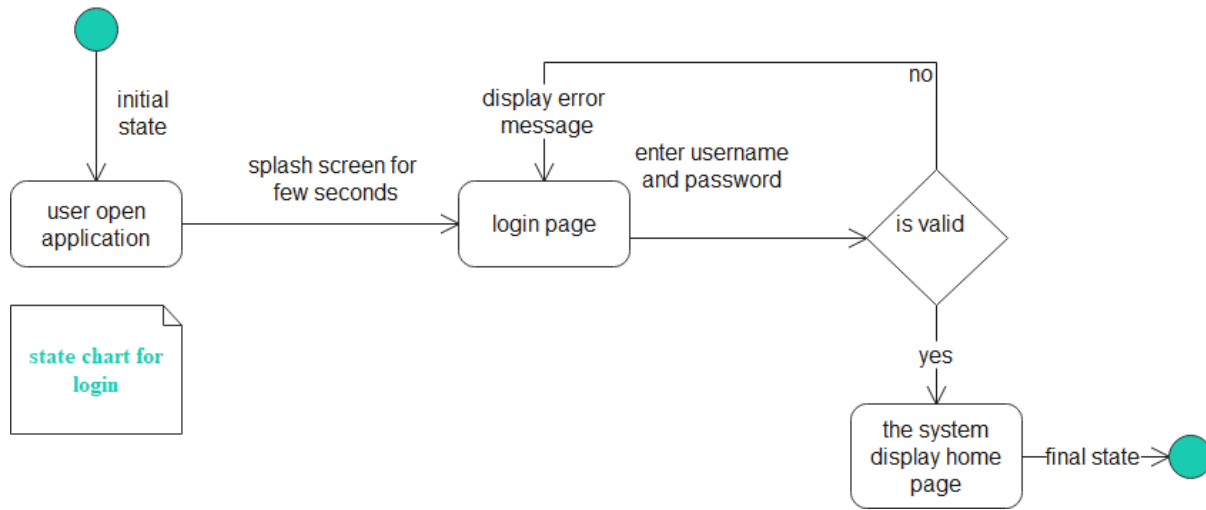


Figure 4. 9: Login state diagram

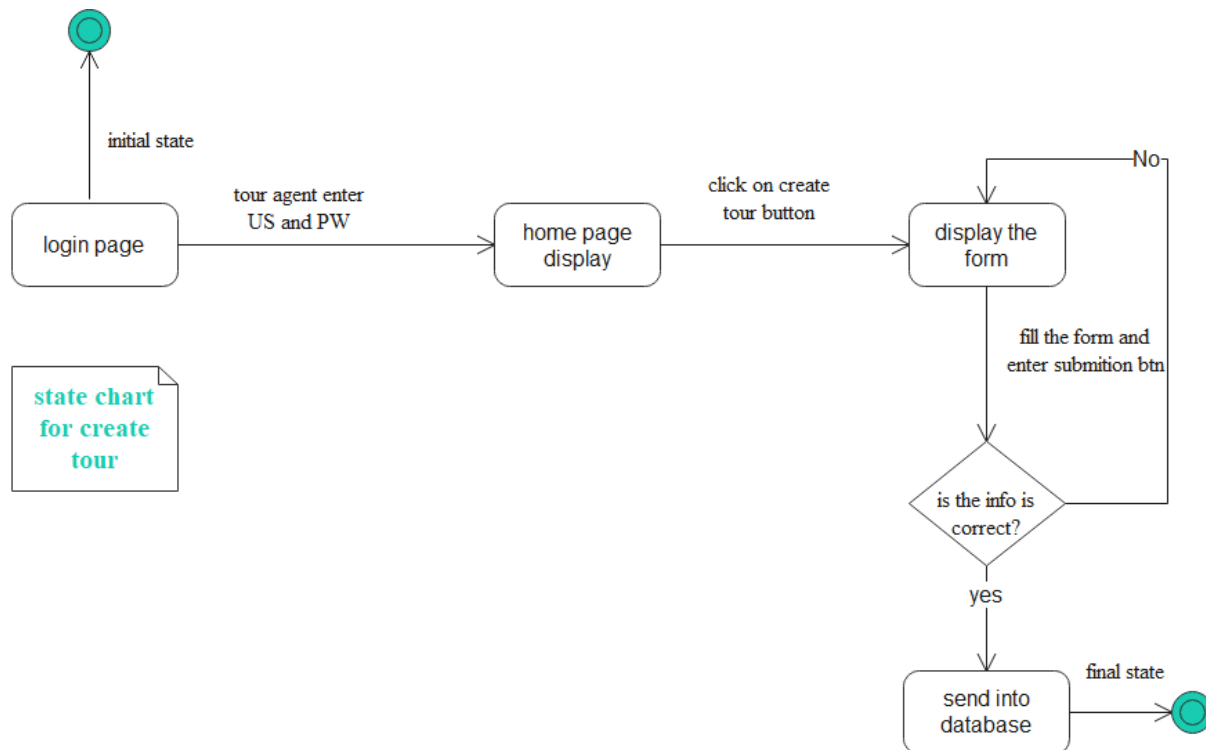


Figure 4. 10: State chart diagram for create tour

4.3 Object model

This section discusses an overview of object model, especially class diagram. The class diagram is static diagram which represent the static view of an application, it describes the attributes and operation of a class and also the constraints imposed on the system.

4.3.1 Class diagram

A class diagram gives an over view of a system by showing its classes and the relationships among them. Class diagram is static and it display what interacts with what but not what happen when they do interact. Class diagram contain class name, attribute and method of the given class.

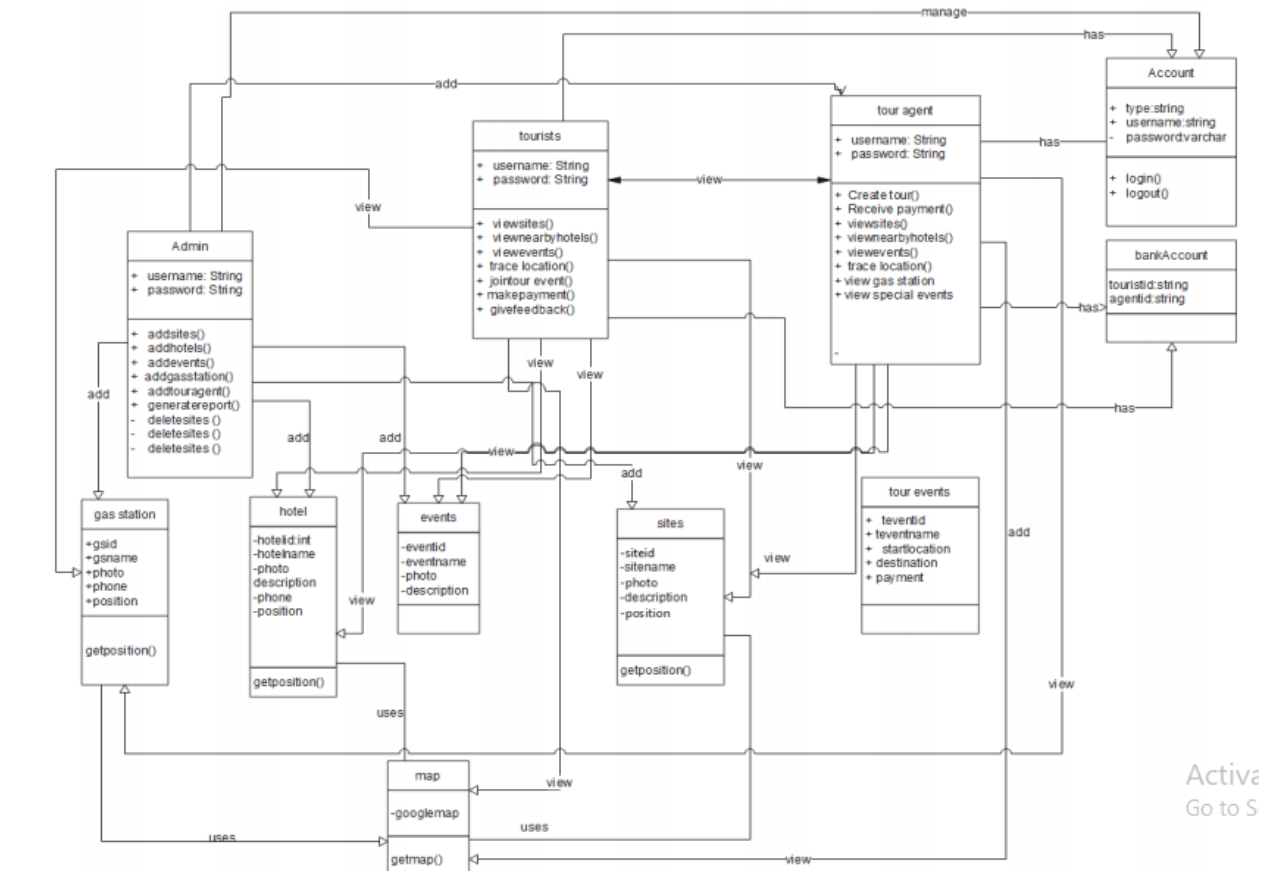


Figure 4. 11: Class diagram

CHAPTER 5

5. SYSTEM DESIGN

System design is the transformation of the analysis model into system design model. It is the process of defining the architecture, module, interface and data for system to satisfy system requirements. System design take into account the non-functional requirement and constraint described in problem statement and requirement analysis section described earlier.

The main objective of design to show the direction how the system built and obtain clear information needed to drive the actual implementation of the system. It is based on understanding of the model the software built on.

5.1 Design goal

The goal of the design is to model a system with high quality for minimizing time and amount of resource consumes. This goal can be obtaining or derived from non-functional requirement because of non-functional requirement is important for describe the attribute of the proposed system. It is also important for identify the qualities of the system that should be achieved and addressed during the design of the system like:

- **Performance**

The application completes its task quickly to allow easy input and retrieve of data. The application will be accessible from anywhere and will be accessible anytime user would want to use it.

- **Security requirement**

Since the system will require security features to protect unauthorized access, user needs username and password when they try to login to the system.

- **Usability**

The system should have simple and understandable graphical user interface which have descriptive names. It will give reliable response for each user request.

5.2 Proposed System Architecture

The architecture attempt at a full coverage of the main area of the system: tourist user area, tour agent and the admin. The main components of this system are: the android application on mobile device. The mobile application will be provided to tourists allowing them to view (tourist's sites, nearby hotel, special events, nearby gas station), to join tour events make payment and for tour agent allowing them to view (tourist's sites, nearby hotel, special events, nearby gas station), create tour events receive payment. The web application on the admin (tourism office) computer to add (tourist's site, hotels events), manage user account, add tour agent and manage its account. The database for the admin to store updated information. API (Application Programming Interface) is used to connect the mobile application with backend database to share information. Proposed system architecture diagram is: -

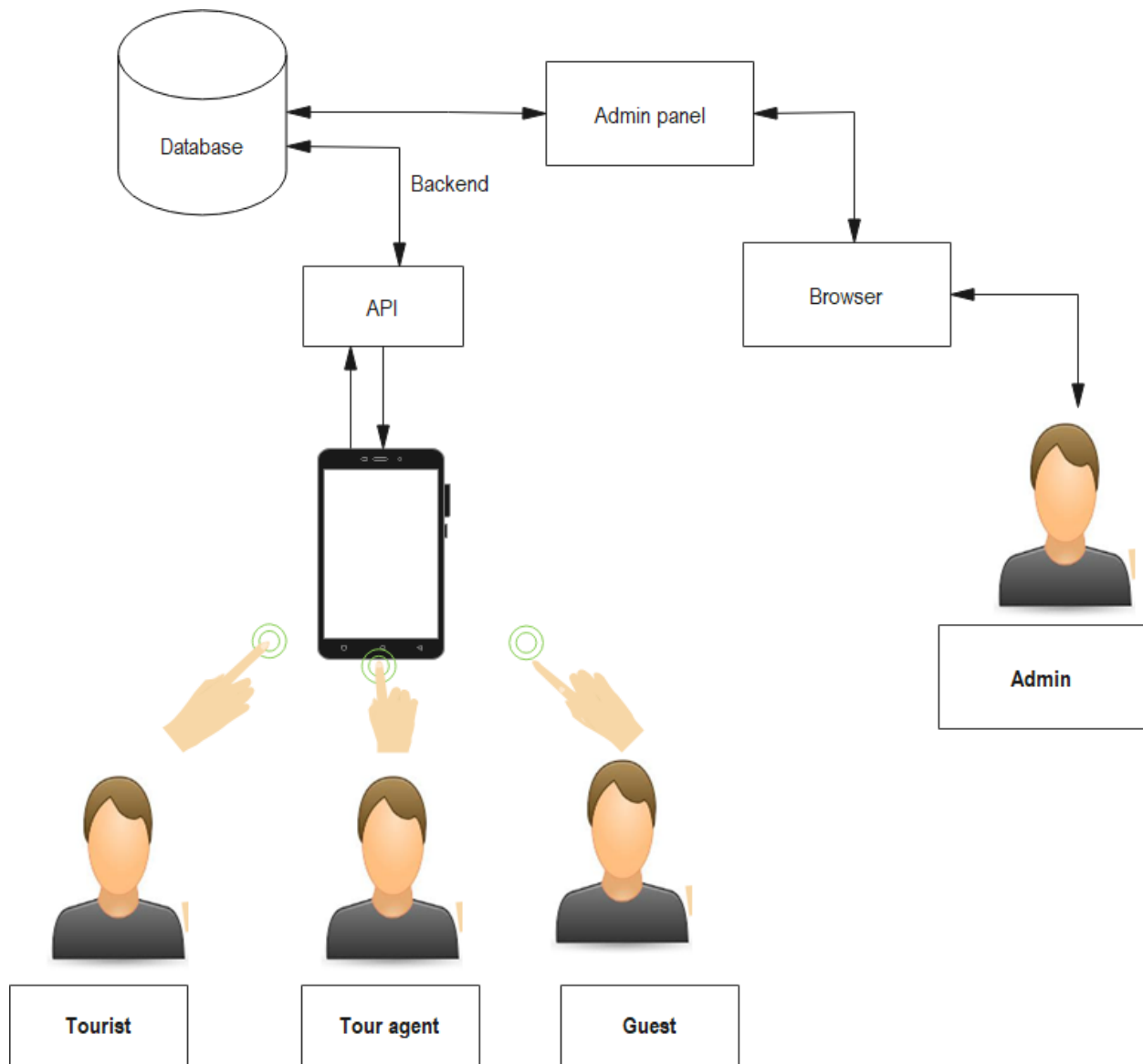


Figure 5. 1: Proposed system architecture

5.2.1 Subsystem Decomposition and Description

Subsystem decomposition describes the decomposition of the whole system into subsystems for the purpose of easily understand the system. To reduce the complexity of the system, we decompose a system into simpler parts, called subsystems. The subsystems are:-

Manage account subsystem: in this subsystem managing of information regard to account and perform.

- ✓ Create account

- ✓ Update account

- ❖ Tourists site subsystem: this subsystem allows to perform
 - Add tourist's site
 - Update information of site
 - Trace location of tourist's site
 - View description of tourist's site

- ❖ Nearby hotels: this subsystem allow to perform
 - Add nearby hotels
 - Update information of hotels
 - Trace location of nearby hotel
 - View description of hotels

- ❖ Special events subsystem: this subsystem allows perform
 - Add special events
 - Update information of special events
 - View description of special events

- ❖ Nearby gas station subsystem: this subsystem allows to perform
 - Add Nearby gas station
 - Update information of nearby gas station
 - Trace location of nearby gas station
 - View description of nearby gas station

- ❖ Tour event subsystem: this subsystem allows to perform
 - Create tour event
 - Join tour event

- ❖ Payment subsystem: this subsystem allows to manage payment information
 - Make payment
 - Receive payment

- ❖ Generate report: this subsystem allows to perform
 - Upload report

View report

❖ Feedback subsystem: this subsystem allows to perform

Give feedback

View feedback

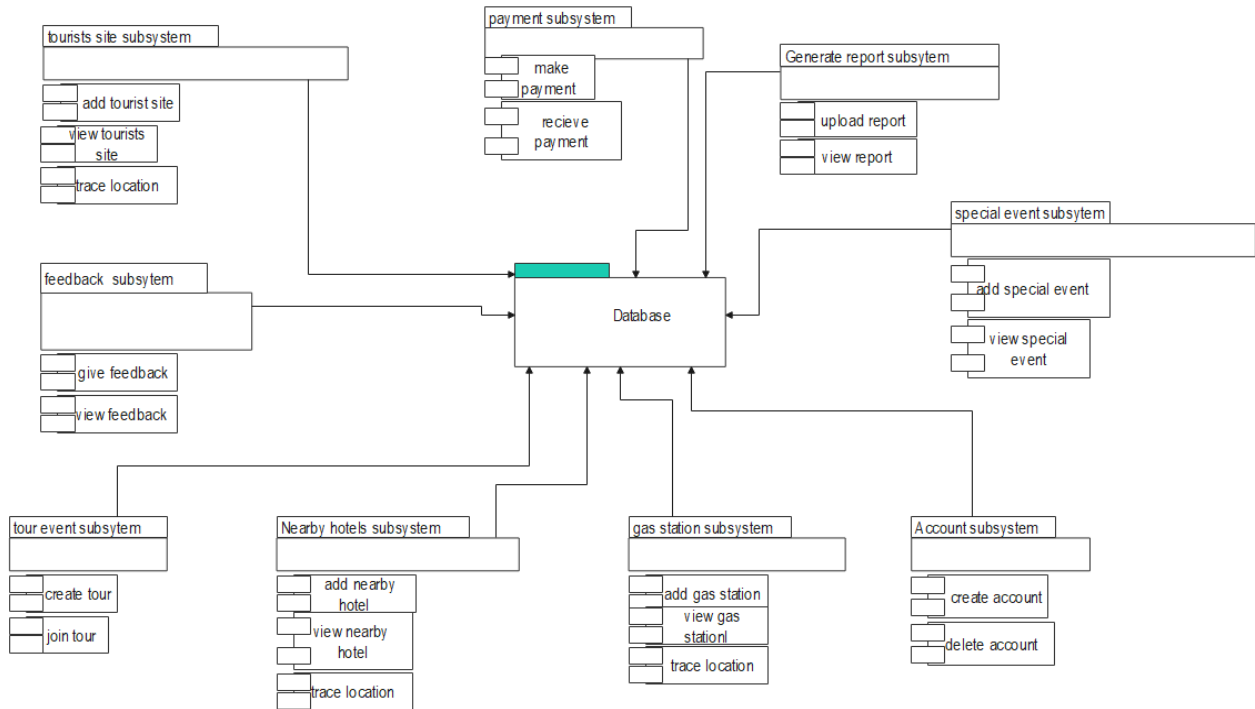


Figure 5. 2: Decomposition diagram

5.2.2 Deployment Diagram

Deployment diagram are used for describing the hardware components where software is deployed. Decomposition diagram and deployment diagram are closely related. Decomposition diagram is used to describe the components and deployment diagram shows how they are deployed in hardware.

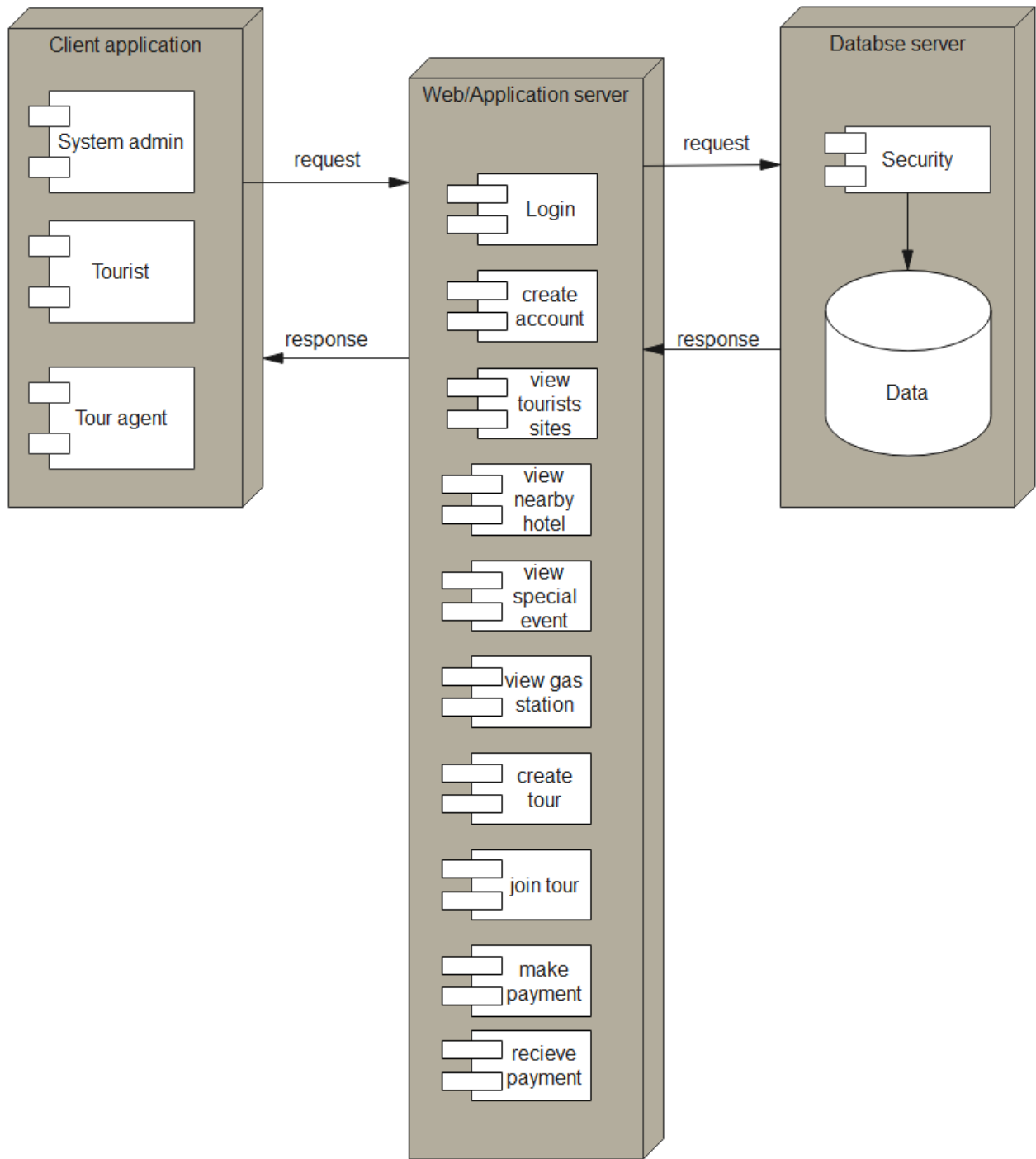


Figure 5. 3: Deployment Diagram

5.2.3 Detailed Class Diagram

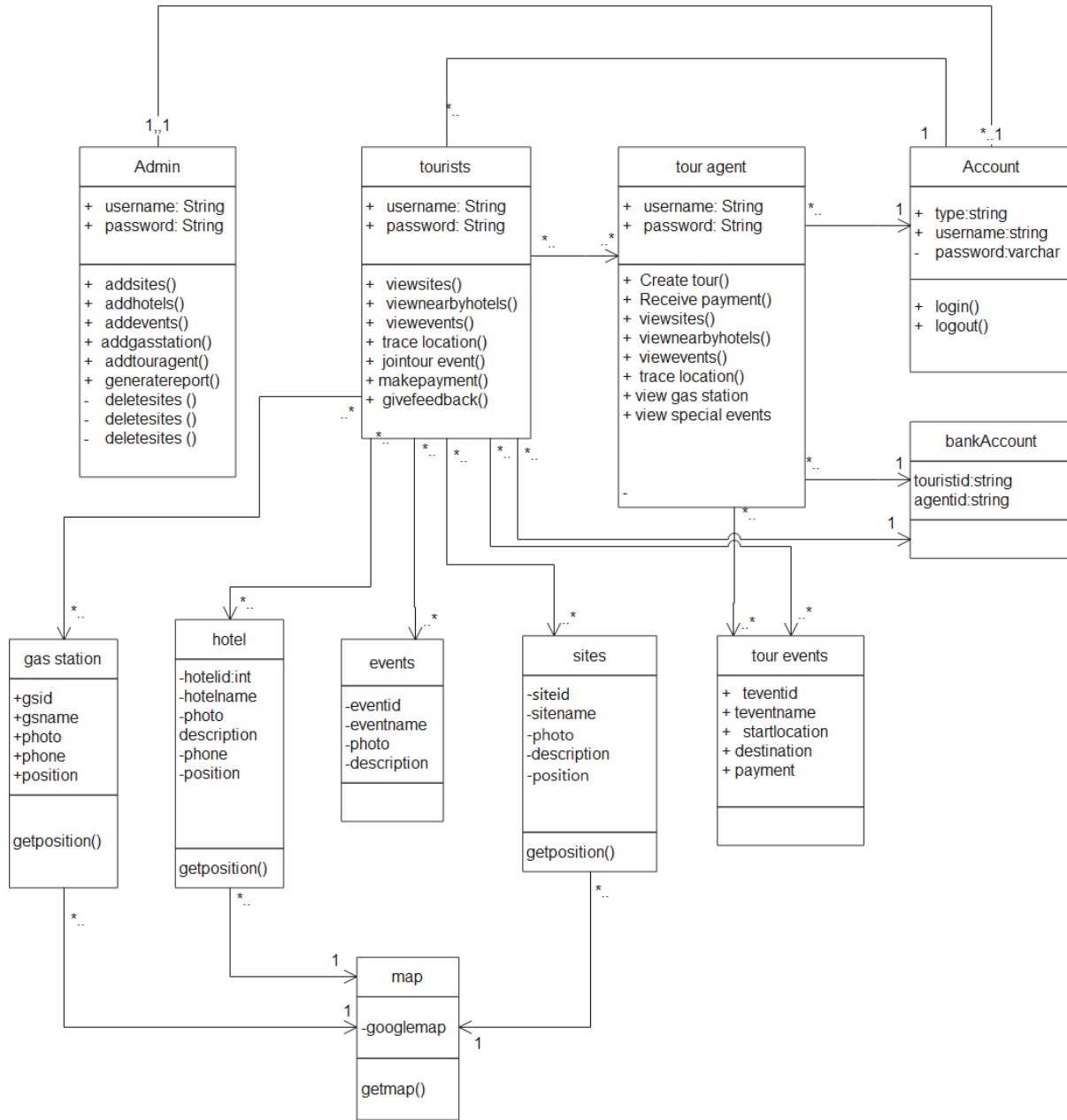


Figure 5. 4: Detailed class diagram

5.2.4 Persistent Data Management

Persistence modeling is used to communicate the design of the database. It is also used to describe the persistence data aspect of the system. The following diagram indicates the persistence diagram of the system.

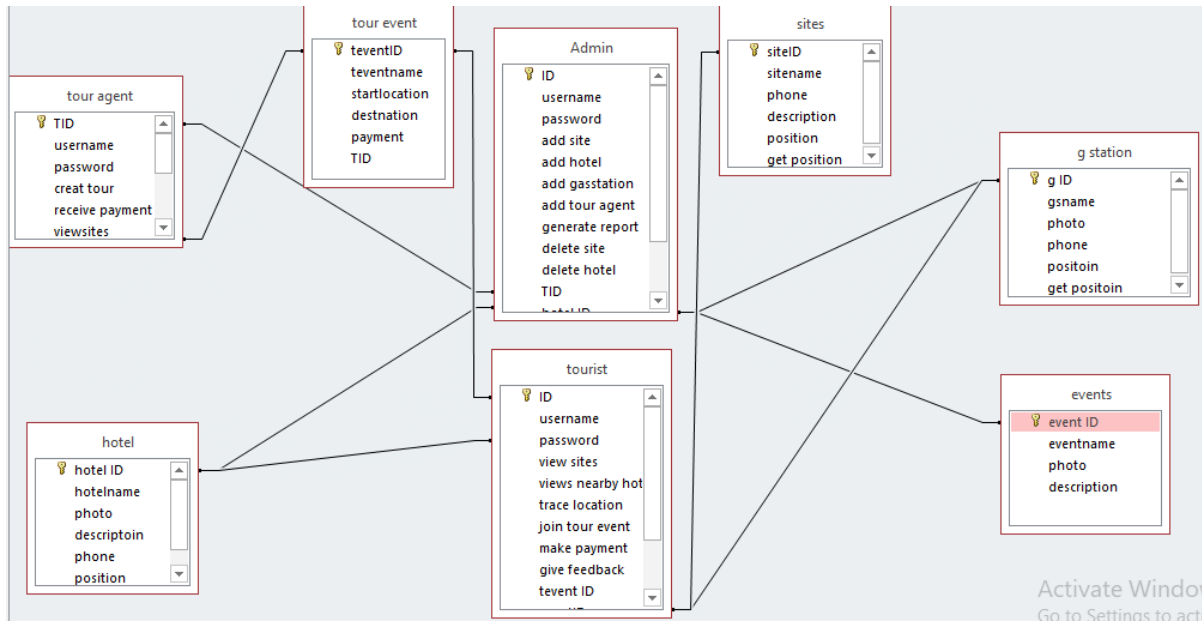


Figure 5. 5: Persistent database management

5.2.5 Access Control Security

Access control and security describes the user model of the system in terms of an access privilege. Accordingly, to the following access control list is given to the system. Each column name specifies the class whose functions are to be protected and the rows specify users whose access is to be controlled. If there are operations in a given cell (column and row intersect) then the user in that given row is said to be given access to these operations.

Table 5. 1: Access control and security

Operations	Actors			
	Admin	Tourists	Tour agent	Guest tourist
Create account	✓			
Add tour agent	✓			
Add tourists site	✓			
Add hotels	✓			
Add special events	✓			
Add gas station	✓			
Trace location		✓	✓	✓
View tourists site		✓	✓	✓
View nearby hotel		✓	✓	✓
View special event		✓	✓	✓
View gas station		✓	✓	✓
Create tour event		✓		
Join tour event			✓	
Make payment			✓	
Receive payment		✓		
Give geed back			✓	
View feedback		✓		
View tour participant			✓	

Every user uses a secure system to access the system, because any user who is not authorized to the system can't access the system. Therefore, in order to keep secure proposed system for an authorized user the system provides user account and password.

5.3 Packages

This section describes the decomposition of subsystems into packages and the file organization of the code. This includes an overview of each package, its dependencies with other packages and its expected usage. The expected package diagram as follows:

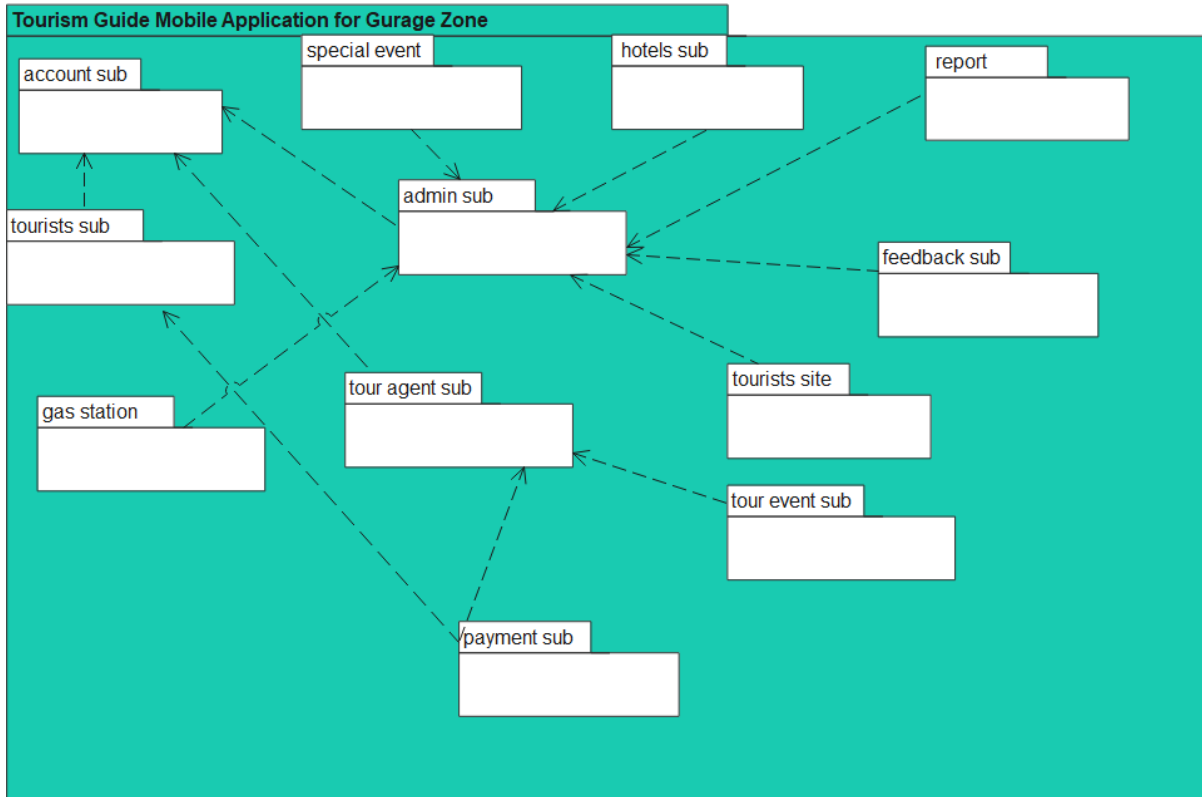


Figure 5. 6: Package diagram

5.4 Algorithm Design

An algorithm is a series of instruction often referred as a process which is to be followed when solving a particular problem. The pseudo code is as follows:

Pseudo code for login:

Step

Method name: login

Begin

GET Username

Get Password

If (username==correct entered username&&password==correct entered password)

Put into session and display the authorized page

Else

Not login to authorized page display error message

End

CHAPTER 6

6. IMPLIMENTATION AND TESTING

6.1. Implementation of database

In this project PostgreSQL database management system used for implementation of the database. We choose PostgreSQL because it is an advanced open-source relational system which applies SQL database language. It allows to store large data safely and it is more secure and scalable. Using PostgreSQL database management system, we perform the following activities:

- We create all tables required using PostgreSQL
- We take appropriate security level for our database

6.2. Implementation of class diagram

Implementation of the system is based on the design of the class diagram. The attribute is properly defined with their data types and modifier. Methods are also defined appropriately with their return types, parameters and data types including access visibility.

6.3. Configuration of the application server

In this project, Django is used as an application server because it is free, open source framework and for the purpose of developmental speed and performance as well as for security purpose. It offers interactive shortcut for full integration with the system database.

6.4. Configuration of application security

Our system validates all the input by returning error message and suggesting to try again when invalid input occur.

- User roles are handled properly for accessing the system.
- User accounts are assigned with necessary access privileges.
- All input validation is implemented properly.
- Suggest to try again when inserting invalid input.

6.5. Implementation of user interface

6.6. Testing the system

The functionality of the developed system must be tested because it has to provide its intended goal or function. The following features are tested: -

- Database and user interface interaction
- Graphical user interface
- Validation and authentication
- Database and application server communication

6.6.1 Testing tools and environment

In this project different testing tools are used for testing the system development process and for debugging purposes.

Software testing tools

- Windows 10 operating system
- Android studio editor
- Web browser(chrome)

Hardware testing

- Computer
- Mobile phone
- Internet cable

6.6.2. Unit testing

It is done at the source or code level for language specific programming errors such as basic syntax, logic error or to test particular functions or code modules. The unit test cases shall be designed to test the validity of the program correctness. It is the way of testing functionality independently. Generally, we used a unit test to correct code error at the right time.

6.6.3. System testing

We applied system testing to ensure the functional and non-functional requirements correctness, performance, accuracy and security have been met correctly. We examined how the whole subsystems work together to achieve the desired goal of the user requirements from the system.

6.6.4. Integration testing

We used integration testing to examine how different procedures work together to achieve the goal of the system. Our integration testing procedure is given below.

- Firstly, we will create users who have role types namely admin, tour agent and tourist.
- Then they will login with their username and password. This test whether the authentication mechanism works correctly.
- Then we also try some wrong user name and password. We expect an error message by trying this case.

6.6.5. Acceptance testing

We used acceptance testing to determine whether or not the software system has met the required specifications. We used it to evaluate the system compliance and verify if it has met the required criteria for deliver to end users. We tested it based on the following acceptance testing criteria.

- Its functionally correct and complete.
- Its usable.
- Scalability and availability
- Performance and security
- It's well documented

CHAPTER SEVEN

7. CONCLUSION AND RECOMMENDATION

7.1. Conclusion

The development and advancement of technology help people to manage their daily task easily and efficiently. Currently Gurage zone cultural and tourism office use manual based way to promote and introduce tourist sites found in the zone. This manual and non-organized way has so many drawbacks. Such as tourists are not able to get organized tourist site information, there is no technology based (digital data) information, there is no tour agents who organize tour events for the tourists, there is not enough information about nearby hotels, gas-stations, special events(festivals) found in the zone.so in order to solve mentioned problems we have developed a android based tourism guide mobile application.

7.2. Recommendation

According to scope of our project the team tries to develop android based tourism guide mobile application for Gurage zone. Due to time constraint, we may have limitation that should be a consideration, but in the future, the team believe that this system should be fully operational by adding some functionalities that is not included in the system and enlarging the scope. We recommend for future studies customize and update the system to be functional for all regions in Ethiopia in order to introduce our nature gifts to the world.

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