UMM AL-QURA UNIVERSITY

COLLEGE OF COMPUTER AND INFORMATION SYSTEMS

INFORMATION SYSTEMS DEPARTMENT

EXSB FOR ATTRACTIVE ADS

Arwa tawila – 437036308

Amnah fuad – 437034414

Fatima Alshahat – 437036317

Halima Alhusini – 437035781

Raghad Alhashmi – 437005291

Supervised By

Dr. Deafallah Alsadie

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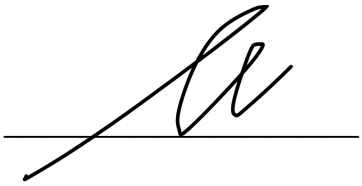
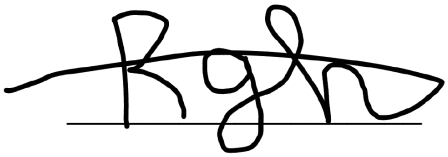
ABSTRACT

The project aims to address the lack of the entertainment in the existing advertisements. The document illustrates the purpose of Exsb system, what problem had solved and describe the system working mechanism from the user perspective. It also clarifies the interfaces and the tools helped to develop it. That would create a system that focus on merging advertisements with entertainment for more excitement. In addition, defining the ambiguous vocabulary.

DECLARATION

We hereby declare that our dissertation is entirely our work and genuine / original. We understand that in case of discovery of any PLAGIARISM at any stage, our group will be assigned an F (FAIL) grade and it may result in withdrawal of our Bachelor's degree.

Group members:

Name	Signature
Arwa tawila	
Amnah fuad	
Fatima Alshahat	
Halima Alhusini	
Raghad Alhashmi	

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The concept of advertising has become an important issue in the world of marketing. Advertising simply means defining a specific product or brand to attract people's attention, introducing them to the services and features available, and increasing profits.

In recent times, the need for marketing has increased due to the abundance of products and competition from firms. Marketing has become very much associated with technology

The competition has become bigger by presenting ads in an innovative and more interesting way, There are many applications that support ads, but we thought about a way that complements the shortcomings of the current applications and combines benefit and pleasure, Therefore, we preferred to work on this project because it would be a good opportunity to learn good and new concepts that combine marketing and technology, which are the two elements that have become very popular in recent years.

1.1 Problem domain

The problem exists in the commercial sector, especially for emerging enterprises. The high price of advertisements requires paying out large sums for advertising special by influencers. The general public becomes irritated by traditional advertisements, because of the lack in engagement and interaction with the audience. Also, advertising may not reach the target group if does not have a wide enough geographic reach.

1.0 Problem statement

In general, the commercial field has become closely related to social media applications. The link between them is mutual. Advertising from the commercial sector to the general public, e-marketing, faces many and varied problems; if the advertisement does not reach the target group well, they may not see it at all, the high cost of advertisements, the

audience becoming annoyed by traditional advertisements. There is also the difficulty of the reaching all cities

1.0 Proposed system

EXSB FOR ATTRACTIVE ADS

1.0.1 Aims and Objectives

An application for advertising, which combines fun and profit, and enables marketers to advertise and spread their brand on their own sites in a different and attractive way at a lower cost, and enables participants to obtain discounts and prizes by linking that with fun and interest.

The main objectives of the project:

1- Help shops in advertising and marketing fields.

2- Help small businesses and productive families especially, in advertising through the application.

3- Enabling sponsors to post their ads in an attractive way and cheaper than the market price.

4- Offer discounts and prizes to advertiser and participents.

5- Increasing the opportunity of winning to the participents.

6- enables the advertisement to reaches large number of participents as possible who are within the neighbour that is targeted by the advertisement.

7- Increasing participents knowledge in an interesting way.

1.0.2 Proposed system features

Basic functional requirements:

1- Managing the participants' accounts.

2- Managing advertisers' accounts.

3- Manage ads.

4- Package management.

5- Selecting the area in which the participents is located (specify location).

6- Interaction mechanisms and their management.

7- Watch ads.

8- Notification of new events

1.1 Project Methodology

The chosen methodology to manage this project is Waterfall methodology, The waterfall model is a traditional system creation life cycle model that uses a linear and sequential approach to construct a system. The model is called a waterfall because it progresses gradually from one step to the next in a downward direction. The result of one phase is used as the input of the next phase in this model, which is divided into several phases. Each process must be completed before the next phase starts.

The steps of a waterfall model:

1. Requirement Gathering- Product functional specifications include all possible requirements.

2. Analysis: the requirements and identify the schemas, templates, and market rules based on your findings.

3. System Design — Create a software architecture.

4. Implementation Development: Software development in small unit and perform testing.

5. Testing and Integration Integrating each unit built in the previous process and testing the entire system for any flaws after integration.

6. Device deployment - After both functional and non-functional testing is done, put the product into market

1.2 Resource Requirement

in our project, we need laptops to work on it and the internet for searching and communication, also we use some software to do specific tasks like draw.io, google translation, google drive, and Trello for manage and communicate with the team members. zoom and webex for meeting and discussion.

the data that we will use is a testing data

1.3 Report Layout

the report is beginning with the cover page then abstract, declaration and acknowledgment then page contains the table of contents for all pages of the document, a list of figures, a list of tables

chapter one about introduction contains the problem domain, Problem statement, Proposed system, Aims and Objectives, Proposed system features, Project Methodology, Resource Requirement, Report Layout

chapter two about the background and existing work which contains an overview of existing projects, Limitations of existing projects, Innovations of our project.

chapter three about software requirement specification contains in section own the Purpose, Document Conventions, Intended Audience and Reading Suggestions, Product Scope and References. In section two about Overall Description which contains Product Perspective, Product Functions, User Classes and Characteristics, Operating Environment, Design and Implementation Constraints, User Documentation, Assumptions and Dependencies and BPMN diagram. then in section three about External Interface Requirements contains User Interfaces, Hardware Interfaces, Software Interfaces, Software Interfaces and Communications Interfaces. in section four System Features. in section five Other Non-functional Requirements. in section six Performance Requirements. in section seven Safety Requirements. in section eight Security Requirements. in section nine Software Quality Attributes. in section ten Software Quality Attributes. in section eleven Other Requirements.

in chapter four about software design and in section one contains Design Overview, Introduction, Environment Overview, System Architecture, Constraints and Assumptions. in section two contain Interfaces and Data Stores, System Interfaces and Data Stores. in section three about Structural Design contains Class Diagram, Class Descriptions, Sequence diagram, Sequences diagrams descriptions. in section four contain ER diagram and relation schema.

chapter five about system implementation and validation.

chapter six about conclusion and future work.

Then the appendices and finely the references.

CHAPTER 2

BACKGROUND/EXISTING WORK

(Literature Review, Existing Work)

2.0 Introduction

After research and examination, we found that the average advertising income reaches 200,000 per month, and this is a large amount, in addition to the preoccupation of people with buying the products that are advertised more than others, leading to a depression of the market for others who do not have the sufficient amount to present commercial advertisements that activate their commercial operations. Nowadays, social media applications have become the top in product promotion and are being used more commercially.

2.1 Overview of existing projects

There are many existing projects such as (Coupon - Saudi Coupons - sahseh - Discount Codes – nokhetha - almowafire – mycoupons - almutasuq - Safi - Saudi discounts - Hungerstation – ardiscounts - Mrsoul).

2.2 Limitations of existing projects

1 - It is not interactive with users and does not attract the user and just for buy only.

2 - The inability to exchange the purchase value with points collected by the user.

3- Its reliance on a specific category for advertising and its lack of support for productive families and small business.

4- It has no offers to participate in competitive challenges that require a physical presence in the restaurant.

5- Its reliance on trade only and not interaction with participants.

2.3 Innovations of our project

1-participant' GPS feature to ensure show store within the region or neighbourhood in which the participant is so, services will become faster and more convenient.

2-Increase the enrichment of knowledge , gain fun and awards through participation in interactive competitions and questions and participate in the competitive challenges that required physical attending in the restaurant, by selecting a specific number of participants through the system to participate in the challenge and win the prizes.

3-Discounts and gift offered by Exsb app is higher than other commercial apps.

4-participants can interaction with the app, unlike the other apps

5-Surprise prizes for our app's uploaders by randomly calling one of the participants.

6-A randomly app uploaders selection to win an attending ticket to some of the app events.

7-Enable advertisers to choose or create event in app and this be serve as offer a special for their store.

CHAPTER 3

SOFTWARE REQUIREMENTS SPECIFICATION

3.1 Introduction

3.1.1 Purpose

Exsb is the software whose requirements are specified in this document, and this is the first version of it. Exsb will solve high advertisements fees problems and improve the advertisements way to be more attractive , it have a daily interactive question and competitive challenge required physical attending participants can gain a rewards(prize) from it by answering the questions and get the challenge done , also it might choose a randomly participant to win a prize with out participate in any challenge or answering a questions or randomly app uploaders selection to win an attending ticket to some of the app events, participants can collect a points by answering the questions daily, productive families and other shops can advertise their products through Exsb, in addition, Exsb unable specify the location to show near shops to the participants, unable participants to interact with the software and offering big discounts which isn't in another similar software ,also notifying the participants by the new events and advertisements and the advertisers by new events in the packages to sponsor them.

3.1.2 Document Conventions

when writing then SRS document for Exsb the following terminologies are : to make the document more effective and readable we used time new roman font style and 12 font size and headings are bold and all with black colour.

3.1.3 Intended Audience and Reading Suggestions

This document is written for the researchers, project managers, programmers, designers, developers, testers, documentation writers, This document consists of the various steps and

procedures for the application update Following section describes the rest of the product function. Scope and other overall description. Finally, with the references.

3.1.4 Product Scope

The final product (the application) allows all users to submit ads at an affordable cost.

An application that solves the problem of high advertising prices, combines fun and profit, and enables marketers to advertise and spread their brand on their own sites in a different and attractive way at a lower cost, and enables participants to obtain discounts and prizes by linking that with fun and interest.

3.1.5 References

[1]"Report Writing Format", Grammar.yourdictionary.com, 2020. [Online]. Available: https://grammar.yourdictionary.com/style-and-usage/report-writing-format.html. [Accessed: 20-Nov- 2020].

PM Study Circle. 2020. Product Scope Vs Project Scope | PM Study Circle. [online] Available at: <https://pmstudycircle.com/2012/01/product-scope-vs-project-scope/> [Accessed 20 November 2020].

Medium. 2020. Writing A Software Requirements Specification Document. [online] Available at: <https://medium.com/@enisinanaj/writing-a-software-requirements-specification-document-97d622805aef> [Accessed 20 November 2020].

3.2 Overall Description

3.2.1 Product Perspective

The Exsb application is a new self-contained application and is not based on any previous applications and is not a development version of any existing applications, the application contains many different features and services that are distinct from other applications.

3.2.2 Product Functions

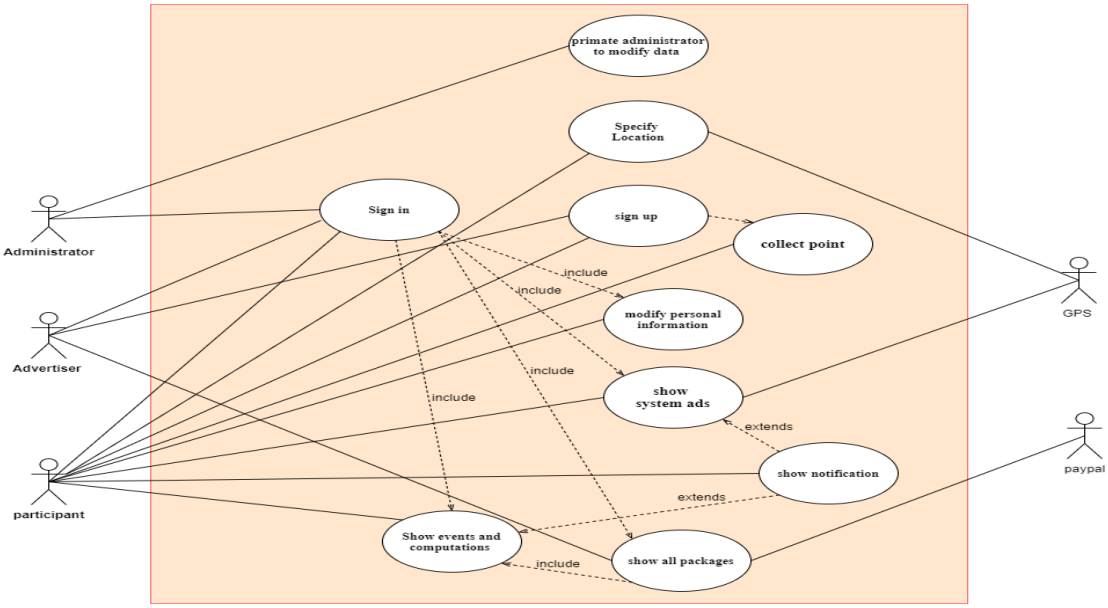


Figure 1*General uses case.*

The application allows user:
1. Sign up.

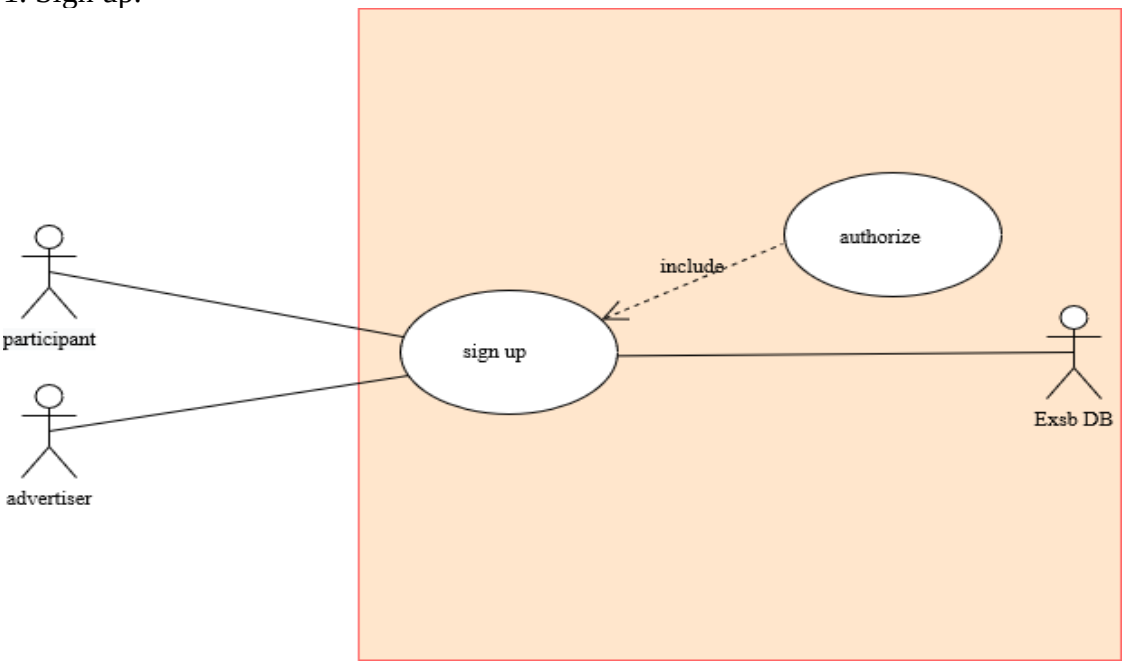


Figure 2sigin up use case

2. Sign in.

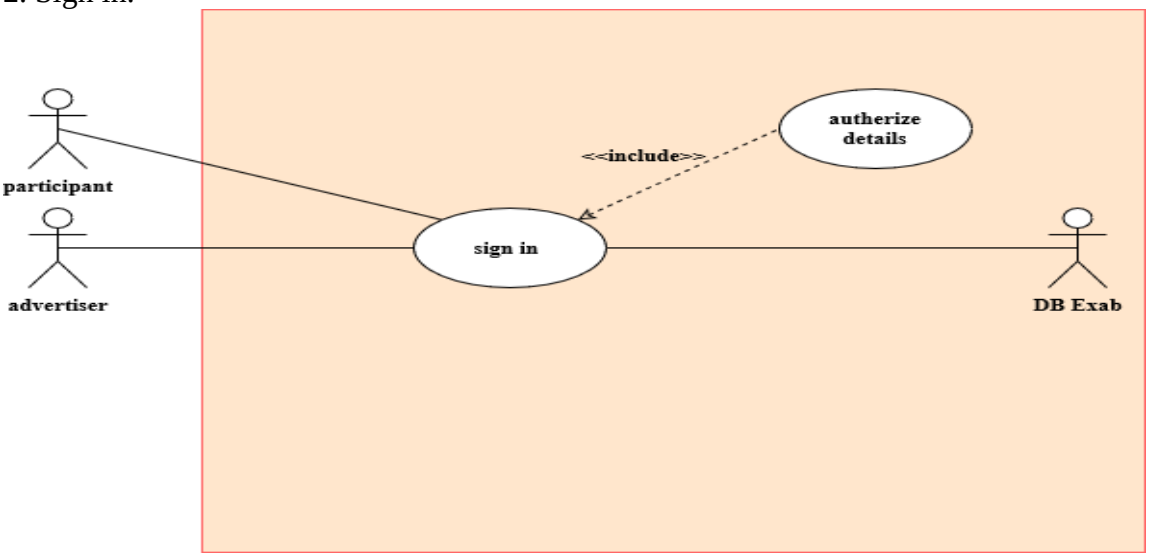


Figure 3sign in use case

3. Specify their location.

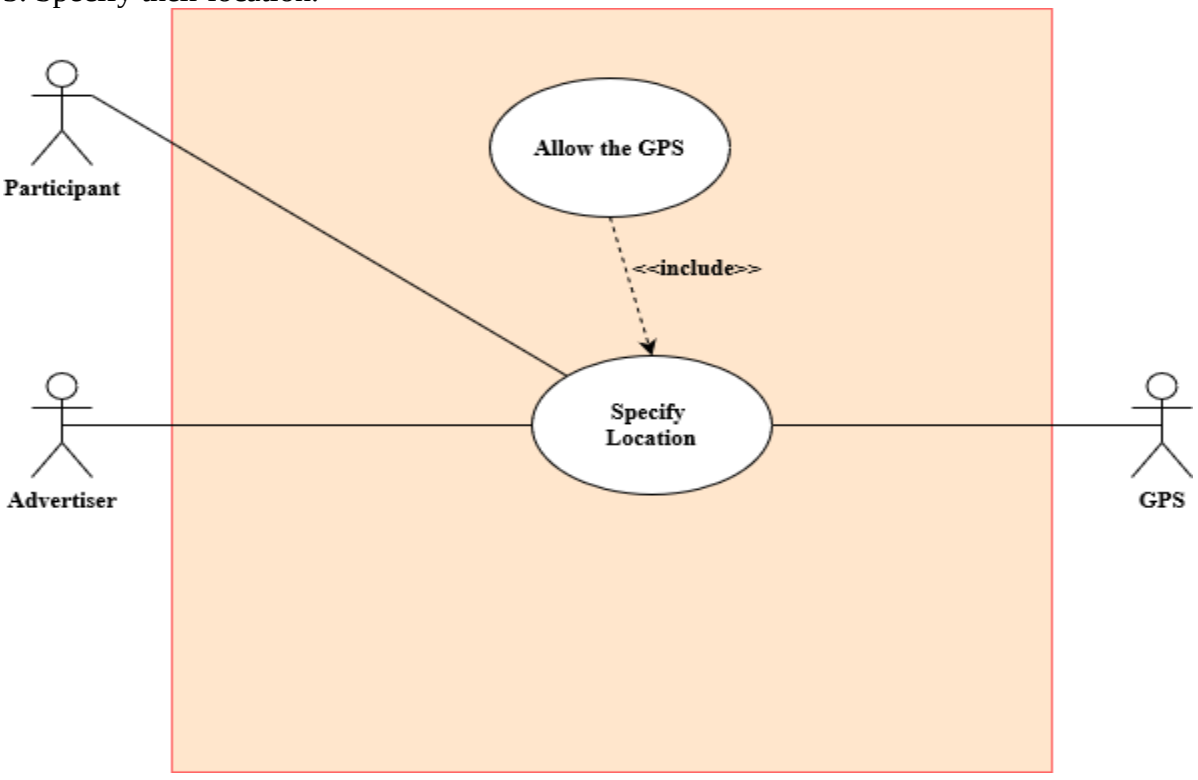


Figure 4 Specify their location usecase.

4. Allow the advertisers to choose the advertisement package.

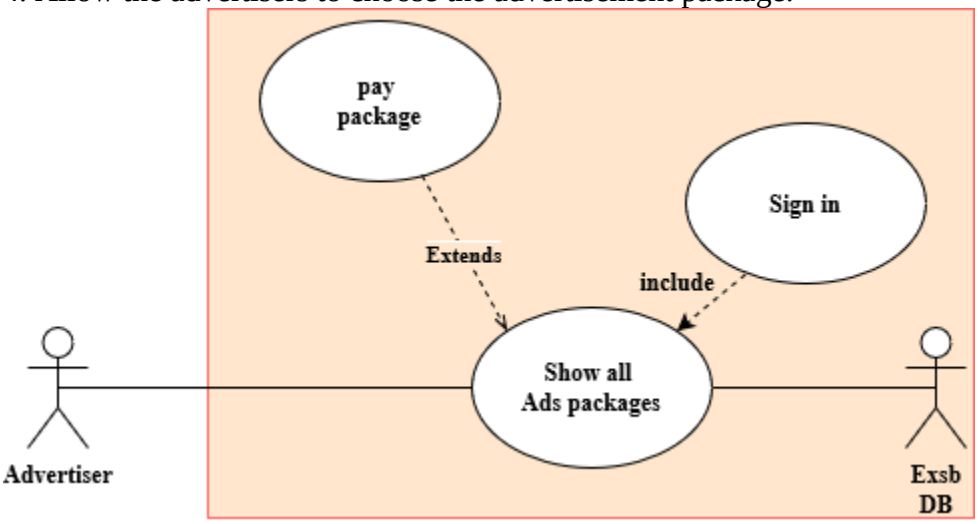


Figure 5 Allow the advertisers to choose the advertisement package usecase.

5. Allow the user to edit their personal information

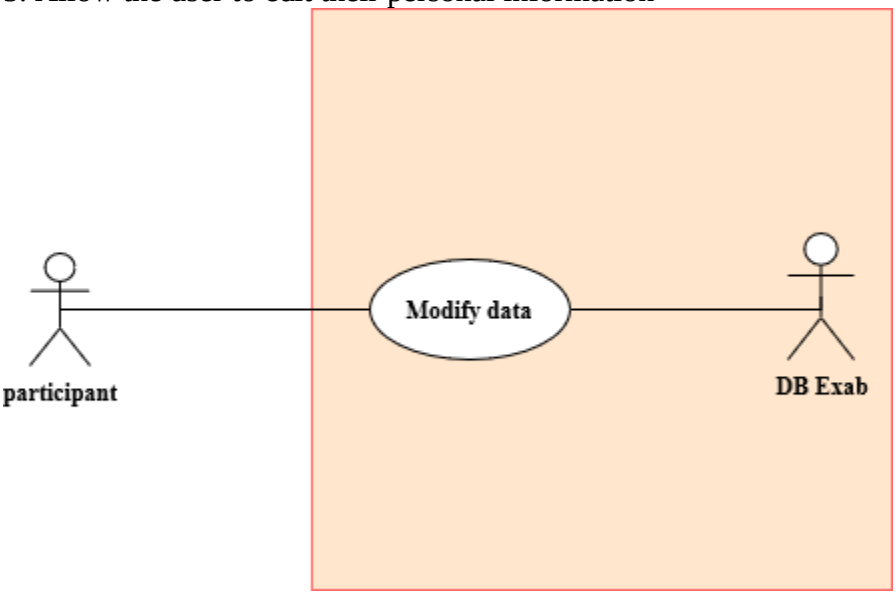


Figure 6 Allow the user to edit their personal information usecase.

6. Allow the participants to show all stores or participate in the system events.

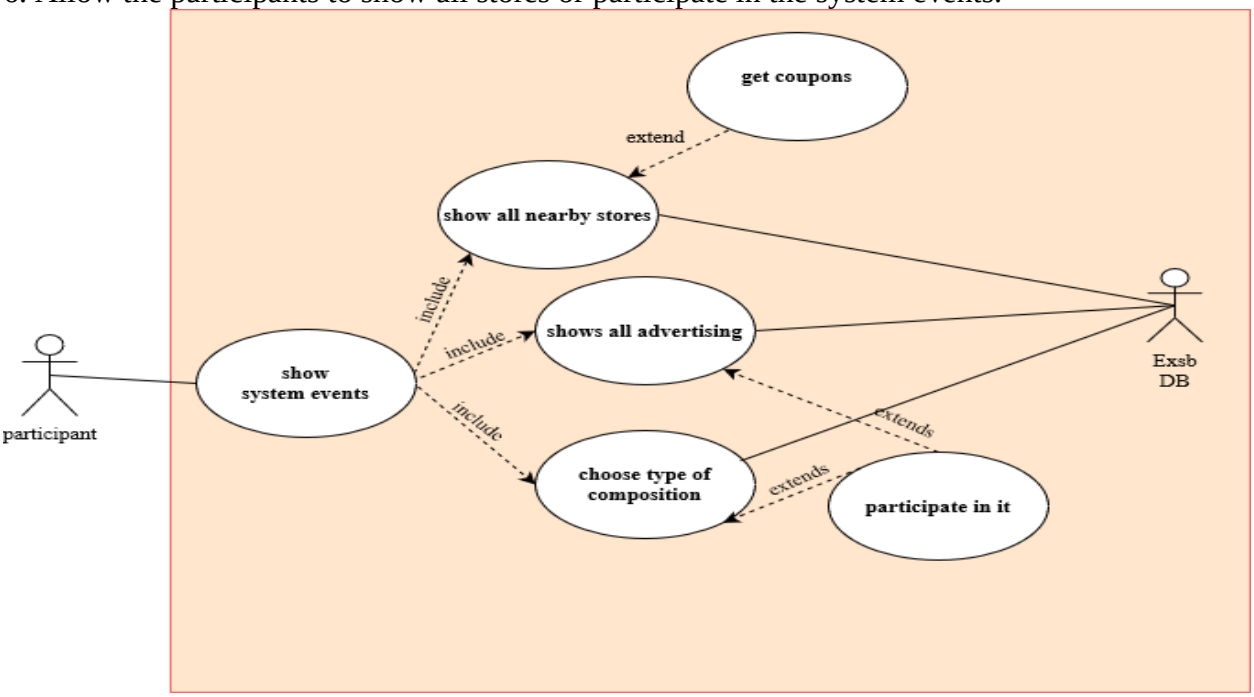


Figure 7 Allow the participants to show all stores or participate in the system events usecase.

7. Notify the participants by the new computations events and new advertisements and the advertisers by the new events in the packages.

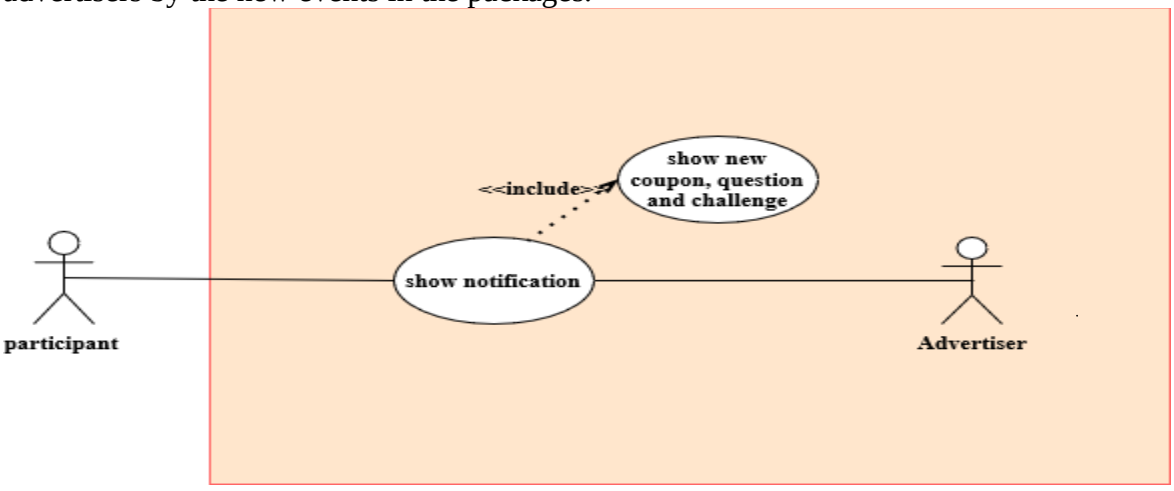


Figure 8 Notify the participants by the new computations events and new advertisements and the advertisers by the new events in the packages usecase.

8. Allow the participants to collect a points.

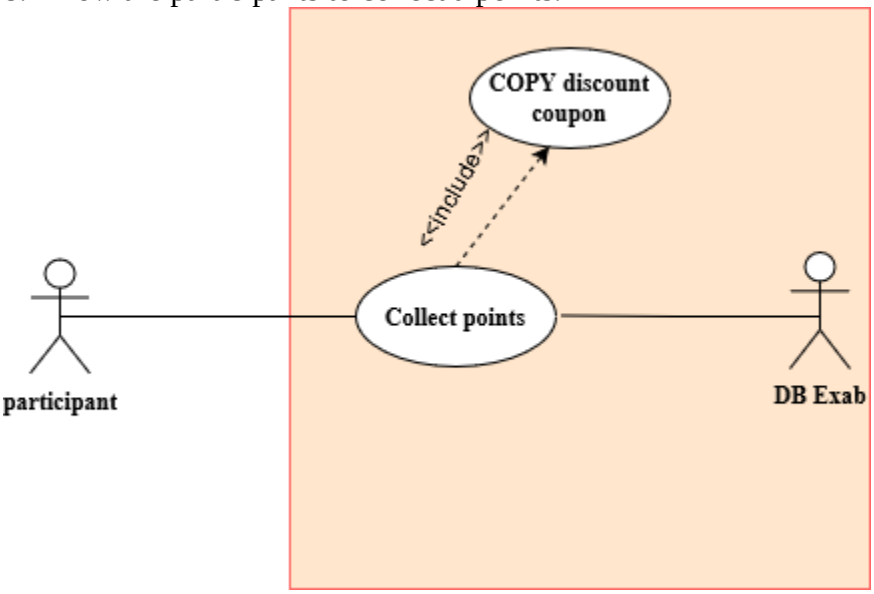


Figure 9 Allow the participants to collect a points usecase.

9. Allow the advertiser to show all computations and participate in the system events.

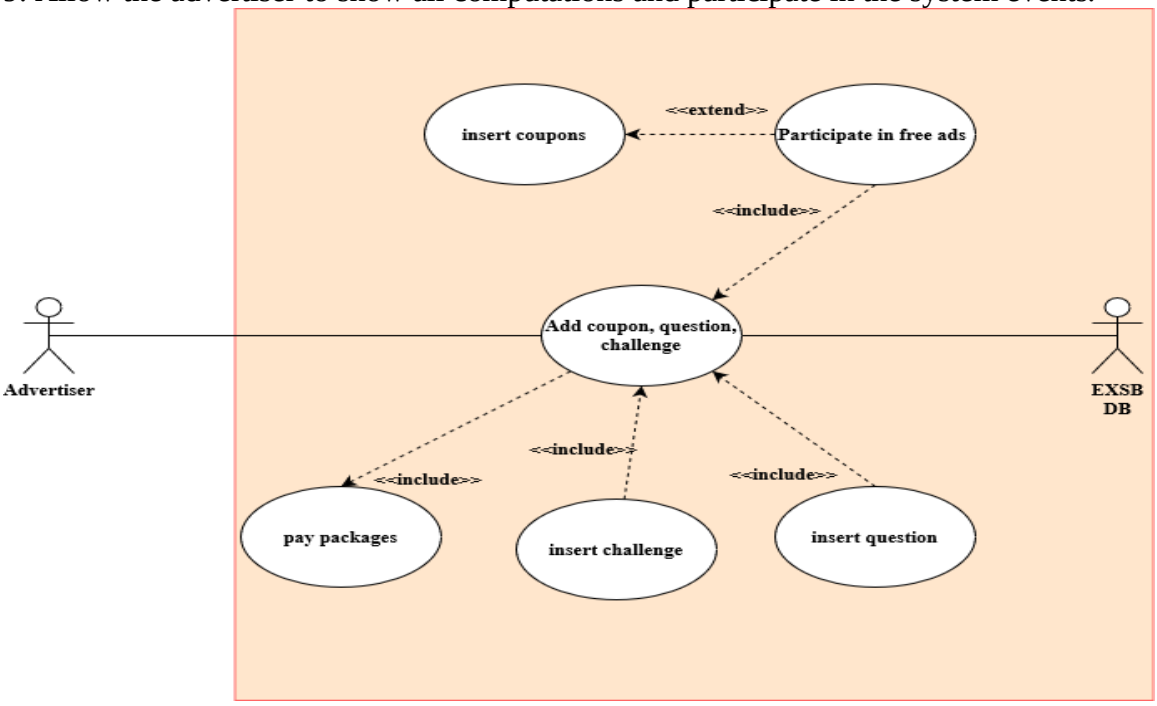


Figure 10 Allow the advertiser to show all computations and participate in the system events usecase.

10. Administrator edit ,add ,delete in system

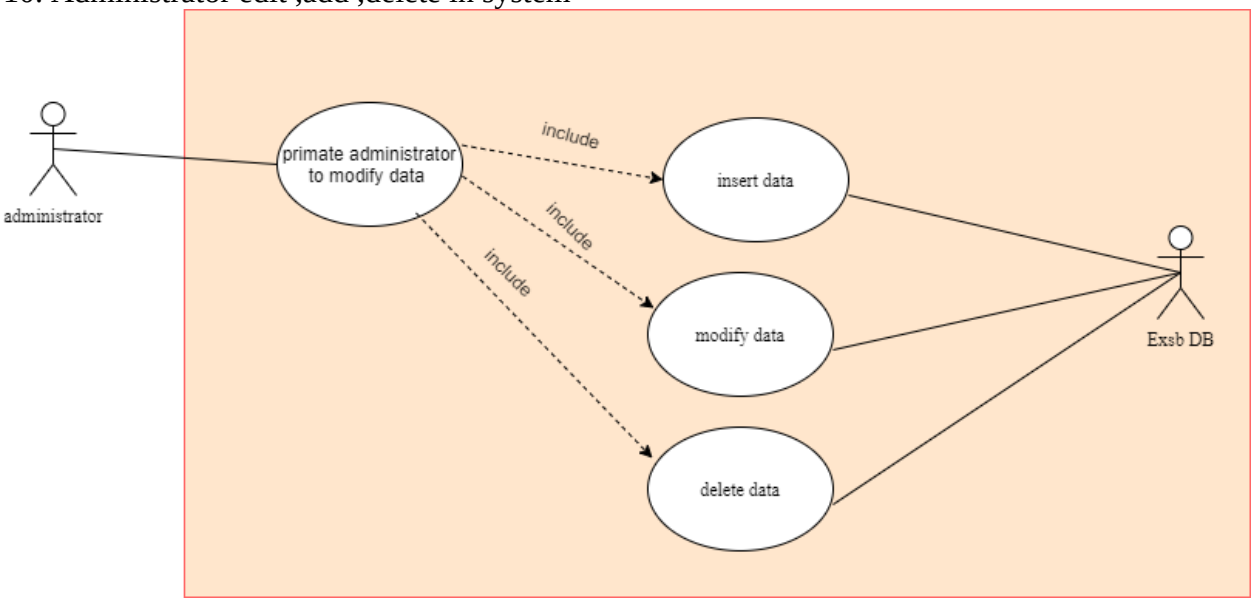


Figure 11 Administrator edit ,add ,delete in system usecase.

Sign up usecase	
Actors	participant, advertiser
Description	users can register themselves by enter username, password, email, phone number and for more specific information as participant enter birthday and advertiser enter store information
Data	register information, advertiser' store information, birthday
Simulate	make system more efficient
response	save user information in database

Table 1-Sign up use case

Sign in usecase	
Actors	participants, Advertisers
Description	The system provides this service manually to the participants and advertisers, this service allows them to sign in to the system to see the other services.
Data	Password and email
Simulate	participants and advertisers are able to get system services.
response	show participants and advertisers main page

Table 2-sign in use case

Specify location usecase	
Actors	User, ExsbDB, GPS
Description	The system provide this service automatically for users to specify their exact location .
Data	Exact location for user
Simulate	Show events and offers to participate in event or use offers
response	View list of events and offers for user based on chosen location

Table 3- specify location use case

Packages usecase	
Actors	Advertiser
Description	The Advertiser can show packages from the system and paying only one of them at time.
Data	Ads data, package data, Advertiser data
Simulate	Advertisers who need to get ads by the exsb system
response	show the event page

Table 4-Packages use case

Edit personal information usecase	
Actors	participant
Description	user may need to modify personal information (name, mobile phone, password) or change the location
Data	Name, mobile number, password, location.
Simulate	user need to modify
response	The personal information for the user has been updated.

Table 5-Edit personal information usecase

Show all stores or participate usecase	
Actors	Participant
Description	The participant can show all stores, advertisement to get coupons. also, the participant can participate in the system computations the questions and the challenges
Data	participant data, competition data (question, challenge), coupons, store data
Simulate	show the event, participate in challenge or question and getting the coupon
response	Show the event, participate in question and challenge and getting the coupon

Table 6-Show all stores or participate use case

Notification usecase	
Actors	participants
Description	The system provides this service automatically to the participants, this notification shows the newest adding coupon, question and challenge.
Data	Information about the new coupon, question and challenge
Simulate	New coupon, question and challenge added to the system.
response	. View the new coupon, question and challenge and participate on it

Table 7-Notification use case

Collect a points usecase	
Actors	participant
Description	user may get point when sign in at the first time or for use a discount coupon. the application will show a conformation massage when add points to your account when you collect a number of points you will get a gift from the sponsors.
Data	number of points, conformation massage.
Simulate	user command
response	conformation massage when add points to your account increase the number of points

Table 8-Collect a points usecase

Add coupon, question, and challenge usecase	
Actors	Advertiser
Description	The system provides this service to advertiser to add coupon, question and challenge, and pay the suitable package based on need and the balance.
Data	advertiser information, package information, coupons information (the discount value and the code of coupon), question information, challenge information.
Simulate	Advertiser want to add coupon, question and challenge and pay package.
response	coupon added, Question added, challenge added and pay package

Table 9-Allow advertiser show system events usecase

Administrator edit, add, delete in system usecase	
Actors	administrator
Description	the administrator can insert, modify, or delete the data of system
Data	interactive competitions and questions, packages
Simulate	need of administrate the system
response	modify system data

Table 10-Administrator edit, add, delete in system usecase

3.2.3 User Classes and Characteristics

There are 3 classes in developing system: Advertisers, participants Administrator

1. Advertisers- a major class in our system, because they are sponsors of the advertisements and events advertised in the application and they provide us with all the required details about them and they can subscribe to the different packages depending on the type of advertisement or event presented, its cost and duration.

2. participants- a class that gives full information about them when registering, such as name, email and phone. Therefore, the different participants will not be mixed in tables, and these participants can benefit from the application and see the advertisements and events in it, participate and interact with what they prefer, and they can also win prizes.

3. Administrator - need full access to database and access to the admin menus.

3.2.4 Operating Environment

The product shall operate in a mobile environment

Operating system: android.

Database: Firebase database.

platform: Dart/flutter.

3.2.5 Design and Implementation Constraints

application must be accessible and easy to use on an Android phone.

UX and UI for Application must be optimized for android since Android 11.0 (R).

Touch mode must be consistently implemented across the Android.

3.2.6 User Documentation

Users can take advantage of the application by downloading it from the application store. After connecting to the Internet, users can create an account, then log in and specify the location, so that they can see the activities of the system according to their locations, and then they can participate to obtain prizes.

As for advertisers, after registering their data, the application will enable them to purchase a package and use it to display their ads on the application. They can also offer discount coupons without purchasing a package as an advertisement for them in the application.

The application also provides a service to edit personal information.

3.2.7 Assumptions and Dependencies

The application will work on test data. initially, the data that the application will be based on may not be real. the users are supposed to know the basics of technology and provide a good internet connection because the app is based on interaction.

3.2.8 BPMN diagram

1-SIGNUP BPM DIGRAM

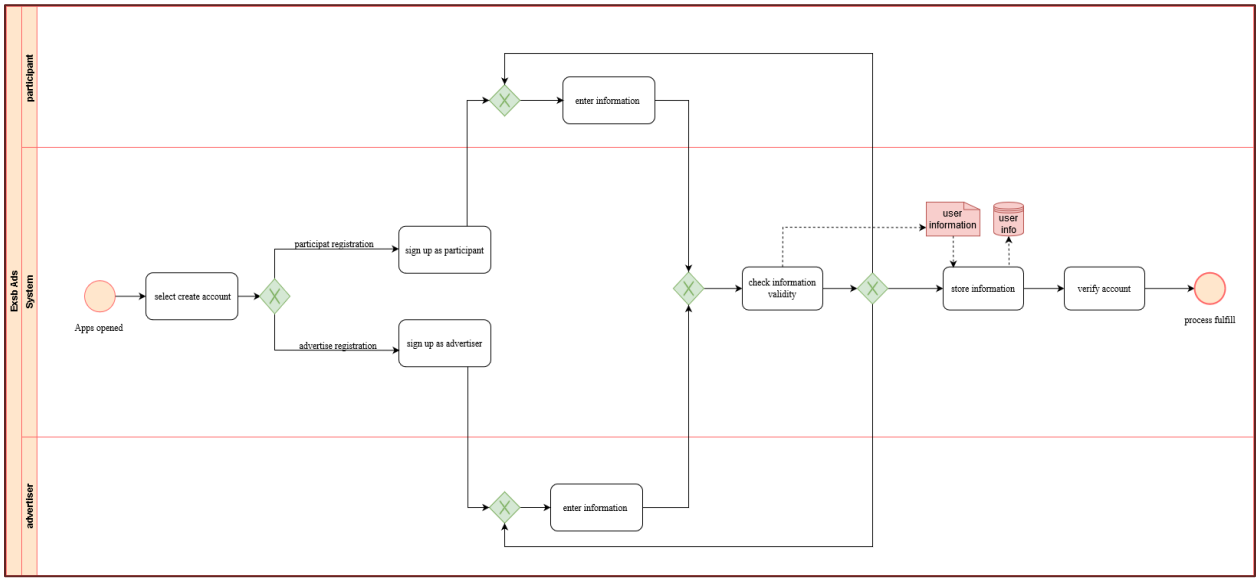


Figure 12 SIGNUP BPM DIGRAM

2-SIGNIN BPM DIGRAM

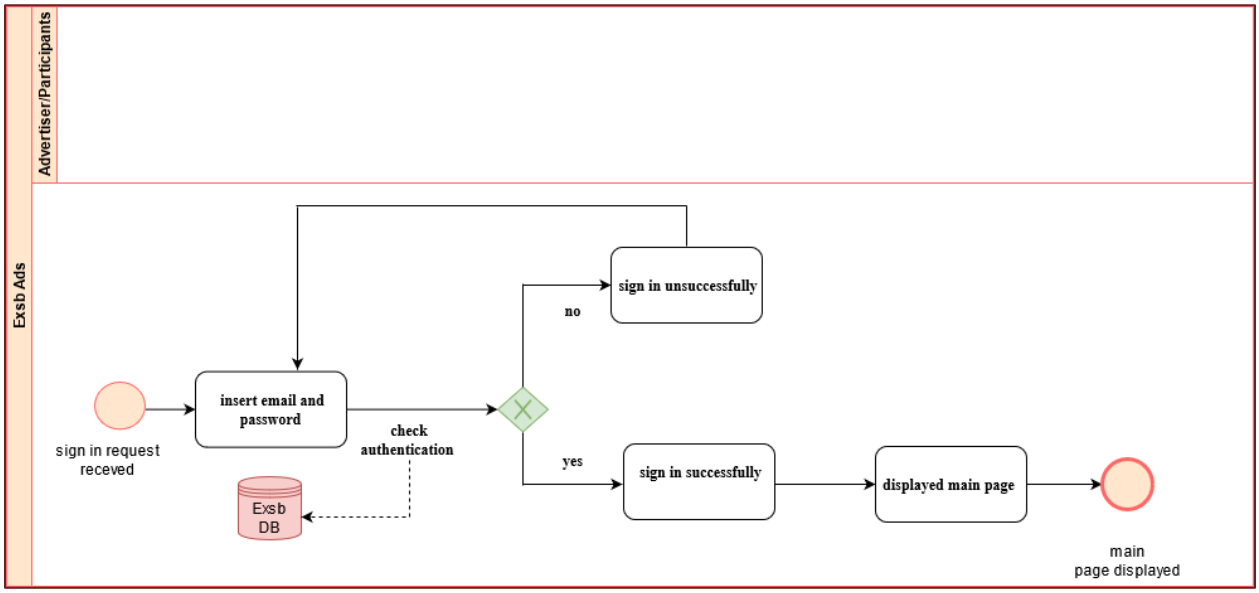


Figure 13 SIGNIN BPM DIGRAM

3- SPECIFY LOCATION BPM DIGRAM

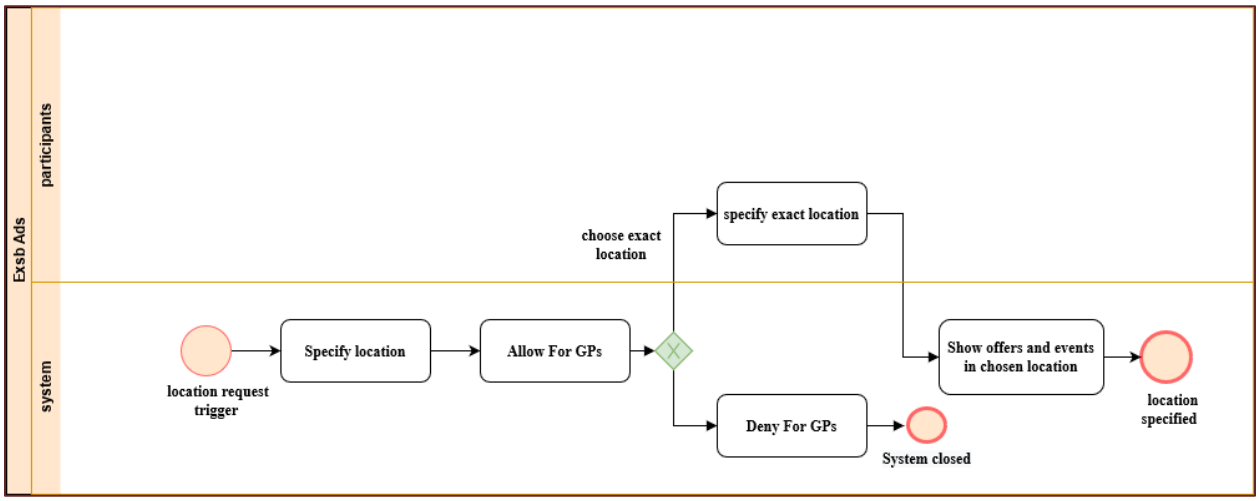


Figure 14 SPECIFY LOCATION BPM DIGRAM

4- PACKAEGES BPM DIGRAM

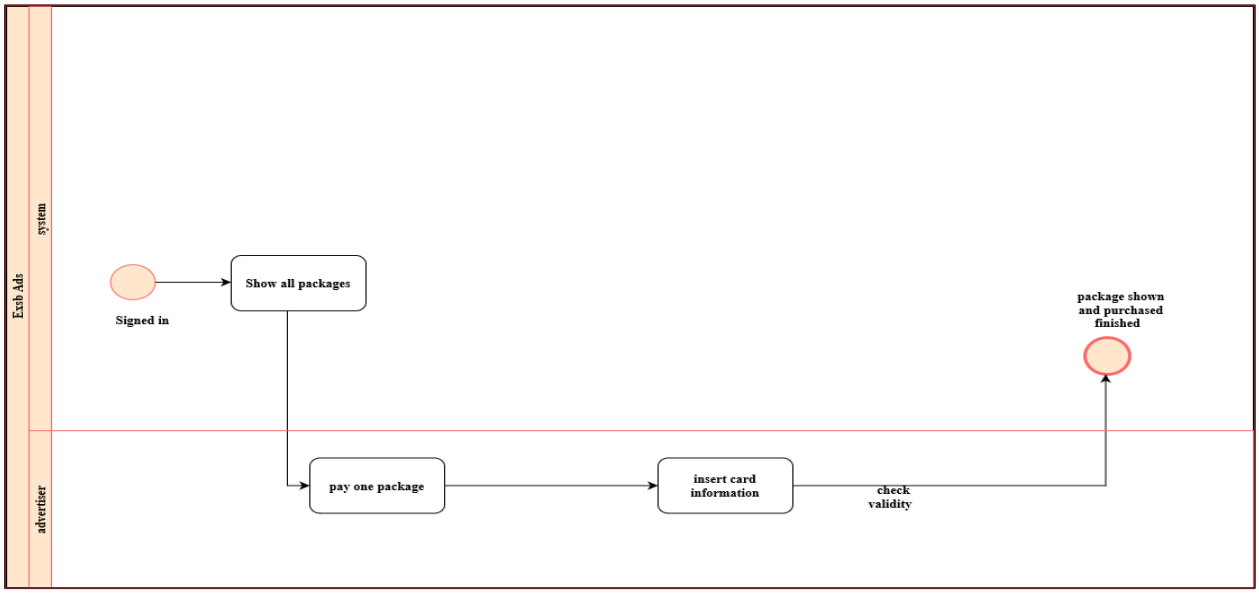


Figure 15 PACKAEGES BPM DIGRAM

5- EDIT PERSONAL INFORMATION BPM DIGRAM

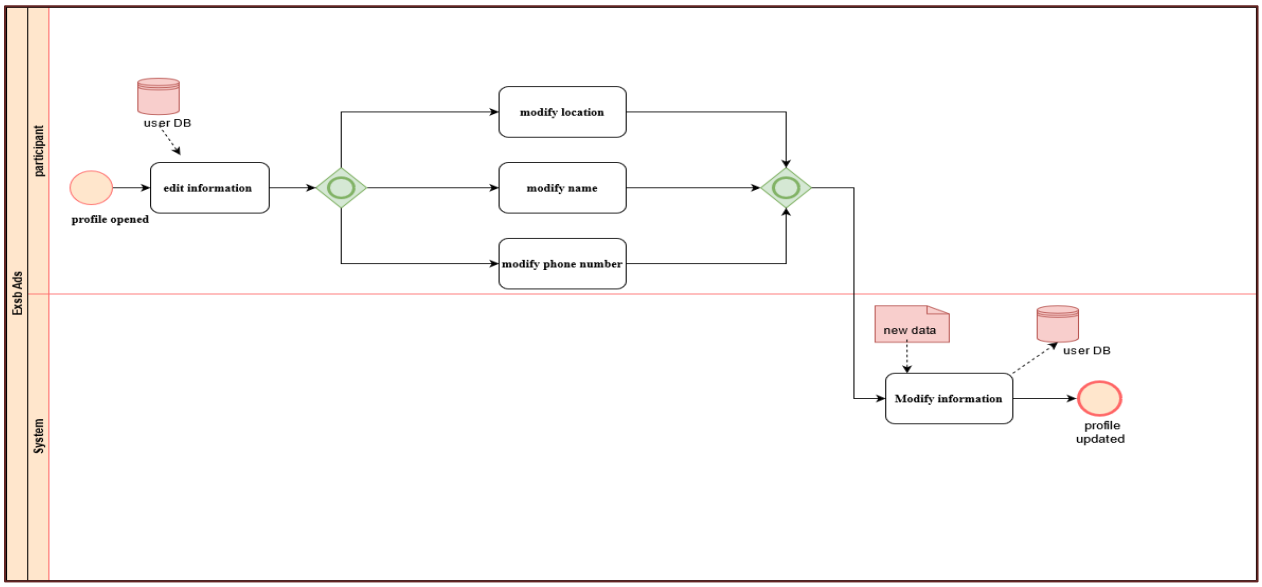


Figure 16 EDIT PERSONAL INFORMATION BPM DIGRAM

6- SHOW AND PARTICIPATE IN EVEVTS BPM DIGRAM

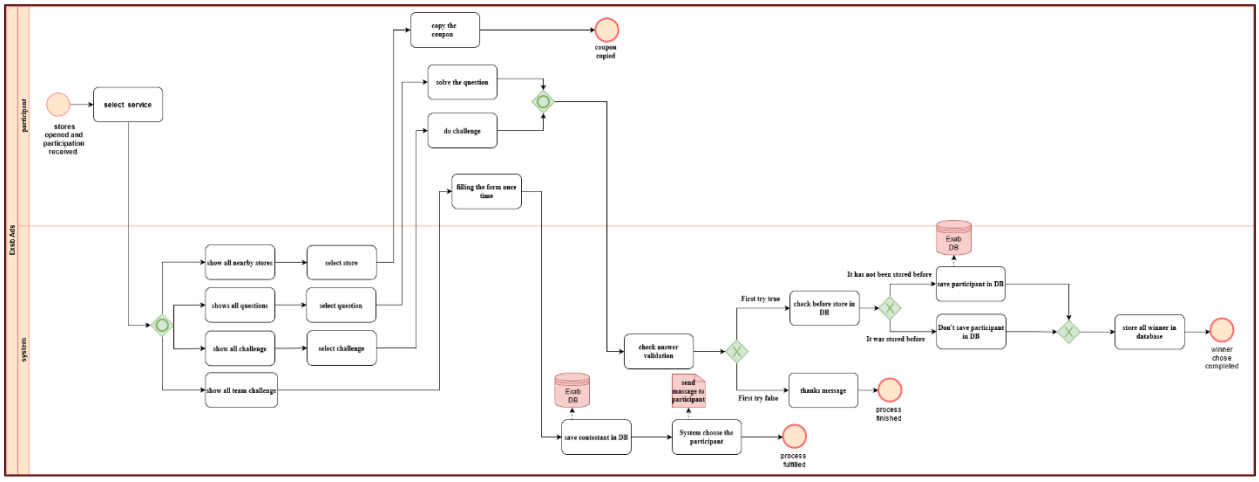


Figure 17 SHOW AND PARTICIPATE IN EVEVTS BPM DIGRAM

7- NOTIFICATION BPM DIGRAM

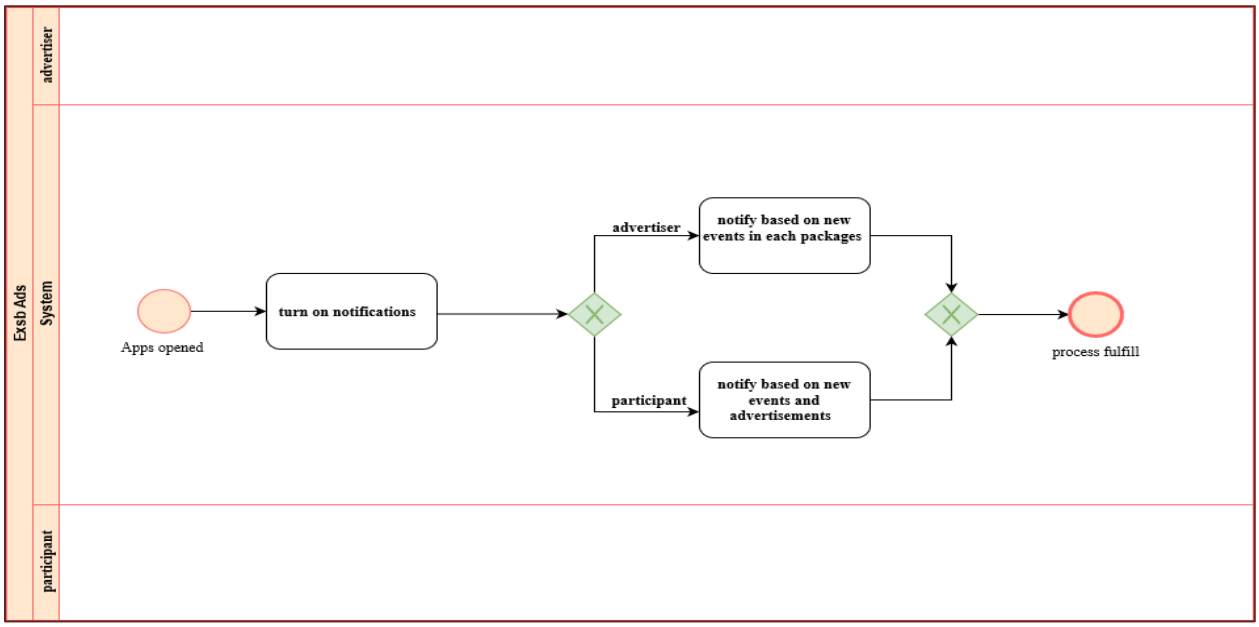


Figure 18 NOTIFICATION BPM DIGRAM

8- COLLECT POINTS BPM DIGRAM

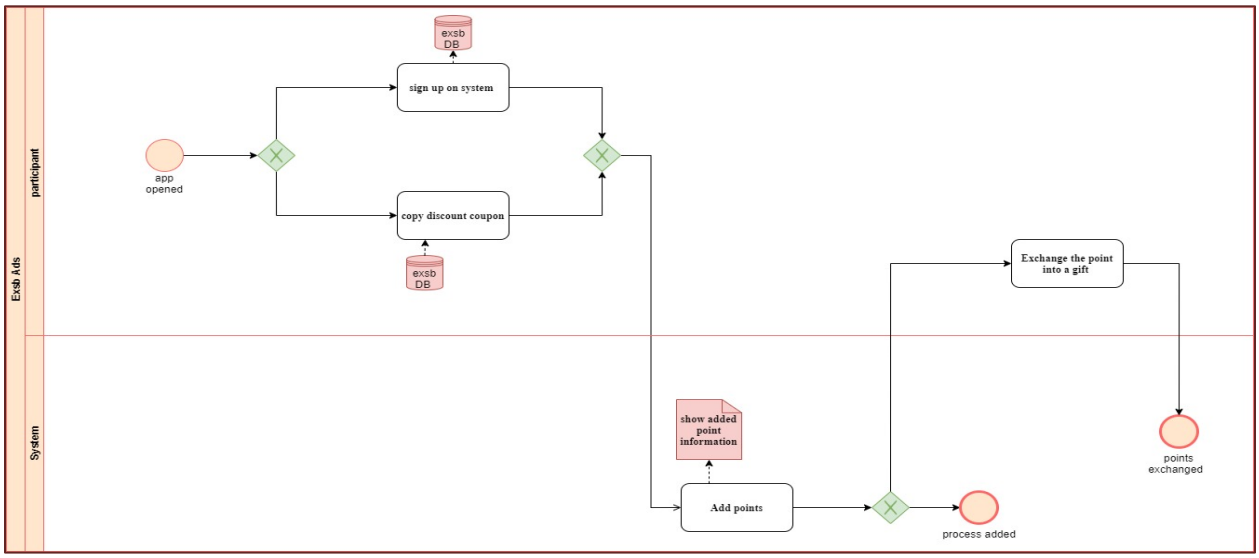


Figure 19 COLLECT POINTS BPM DIGRAM

9- SHOW ALL COMPUTATIONS AND PARTICIPATE IN SYSTEM EVENTS BPM DIGRAM

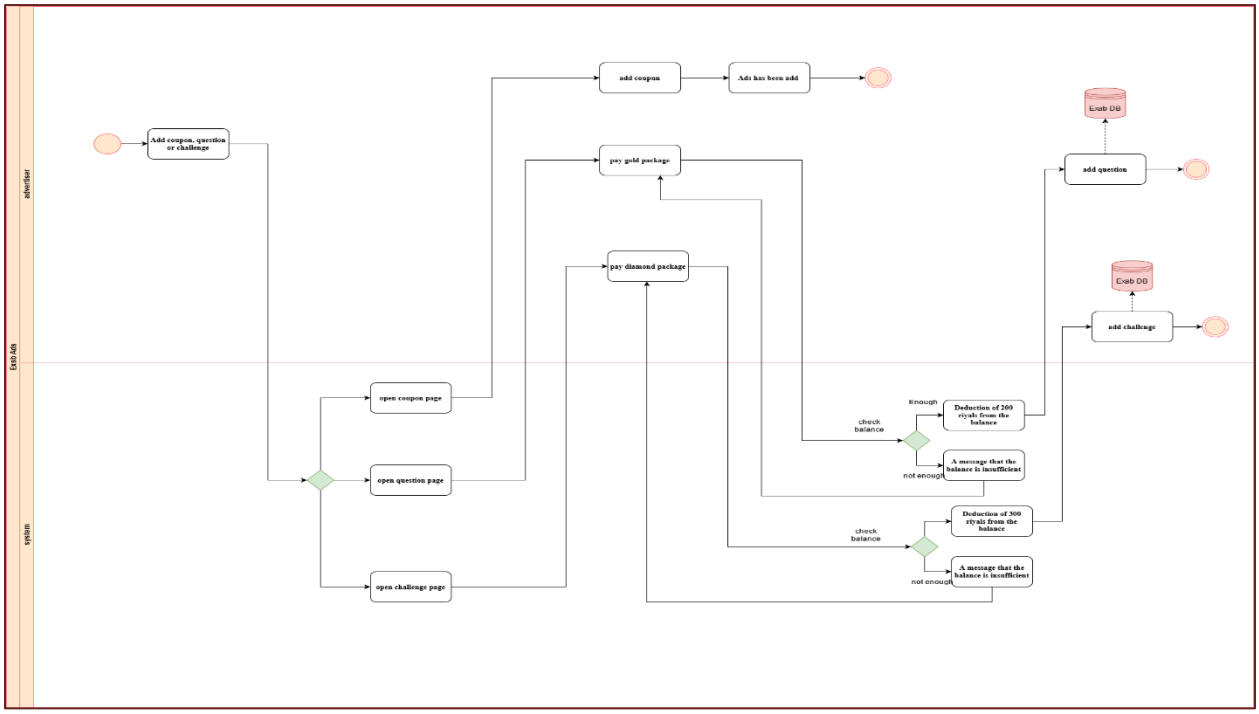


Figure 20 SHOW ALL COMPUTATIONS AND PARTICIPATE IN SYSTEM EVENTS BPM DIGRAM

10- ALLOW ADMINISTRATOR TO INSERT, MODIFY, OR DELETE IN SYSTEM BPM DIGRAM

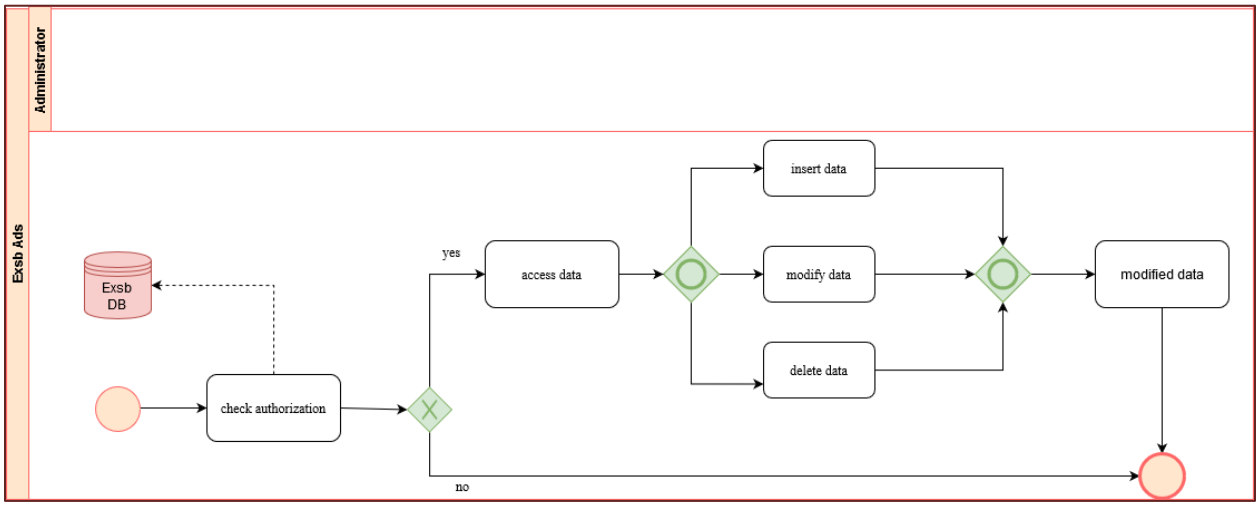
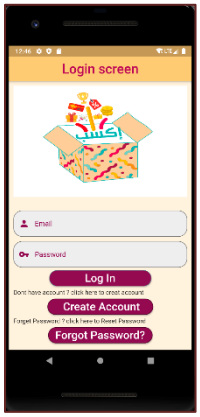


Figure 21 ALLOW ADMINISTRATOR TO INSERT, MODIFY, OR DELETE IN SYSTEM BPM DIGRAM

3.3 External Interface Requirements

3.3.1 User Interfaces

Each part of the user interface intends to be as user friendly as possible. A first-time user of the mobile application should see the log-in page after splash screen when he/she opens the application. If the user has not sign up, he/she should click create account button.



After click on create account user should choose type of user want signup as.

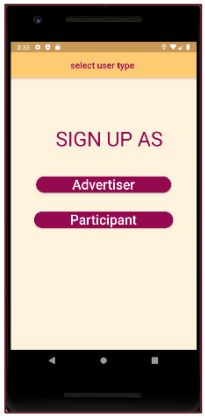
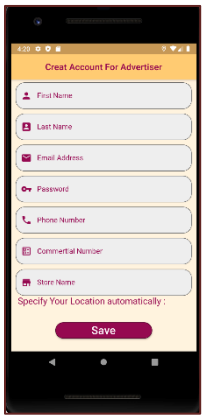


Figure 22:Sign in page

Figure 23:Sign up as page



user should fill blanks with suitable texts after select user type.

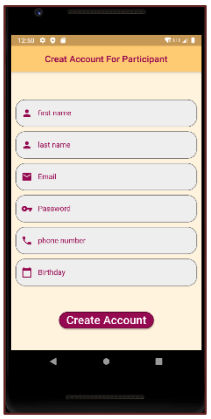
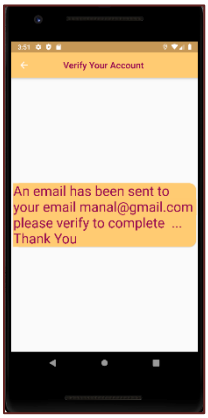


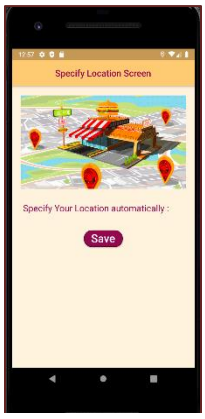
Figure 24:Create advertiser account

Figure 25:Create participant's account



user should open confirm message that send to email after signup.

Figure 26:Verify account



The participants should allow using their location to enable use the app.

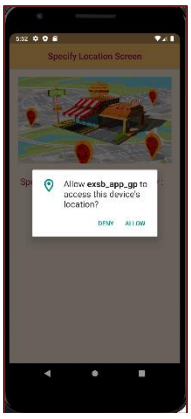
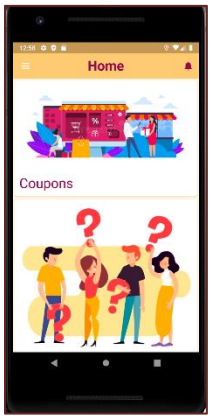


Figure 28:Specify location

Figure 27:Allow access location

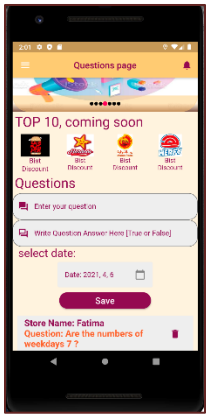


home page shown section of event for user.

Figure 29:Home page

advertiser can insert discount coupon in Advertising page and he see olden coupons if had.

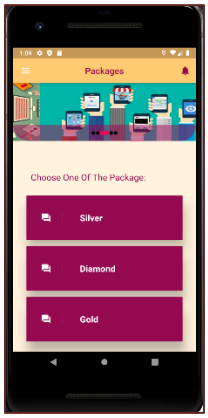
Figure 30: Add coupon page



advertiser can insert Question and challenge after pay package.

Figure 31:Add questions page

Figure 32: Add challenge page



packages page shows all package type.

Figure 33:Advertiser home page

Figure 36:Silver package info

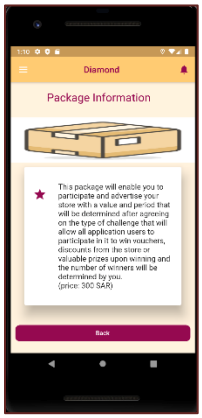


Figure 35:Dimond package info

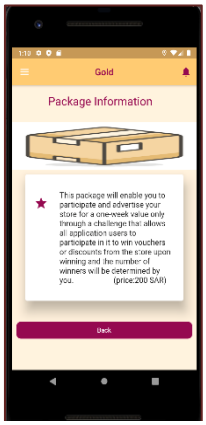
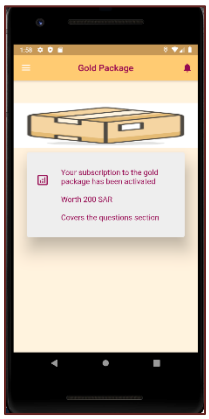


Figure 34:Gold package info

after a click on one type of package will show a description page for its package



after advertiser select any section on the home page the section package will have been activated, when click on a rectangle will continue to the payment page.

Figure 37:Gold package price info

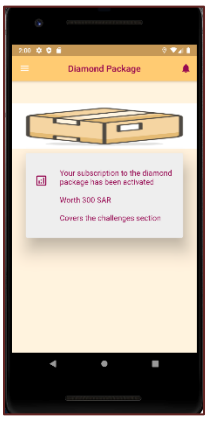
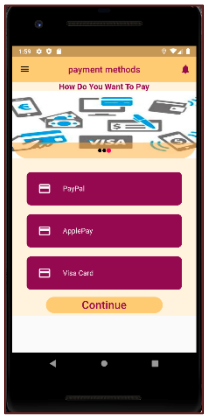


Figure 38:Dimond package price info

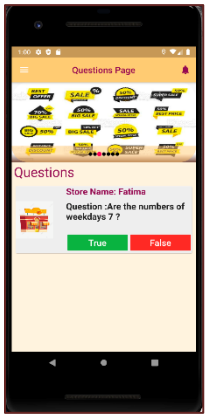


Payment page show for advertiser different method to pay.

Figure 39:Payment methods page

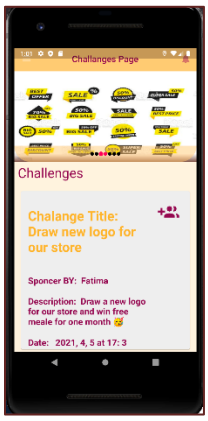
Advertising page show coupons own by near stores from participant.

Figure 40:Participants coupons page



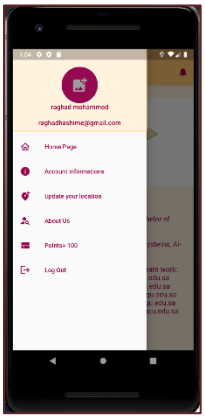
Questions page show Questions own by near stores from participant.

Figure 41:Participants questions page



challenge page show challenges own by near stores from participant.

Figure 42:Participants challenge page



after clicking on hamburger icon, the drawer screen show, appear in it first and last name of a user, his/her email and a menu important screens in-app that shows depend on user type.

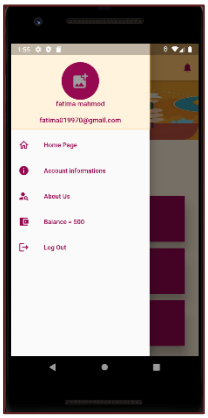
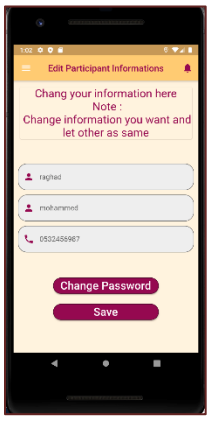


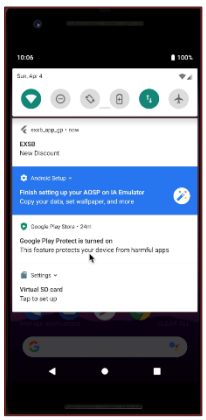
Figure 44: Participants drawer

Figure 43:Advertiser drawer



User can edit her/his first, last name, phone number and password.

Figure 45:Edit information page

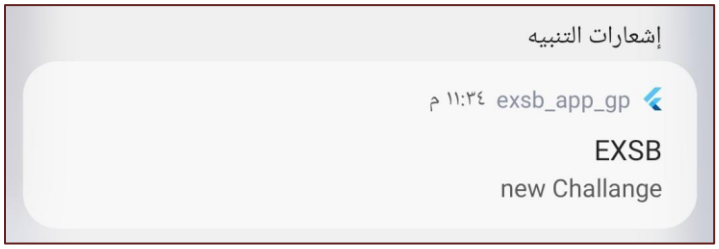


if a new coupon, challenge, and question available on the app then will send to the participant notification about that, and can she/he click on it to transfer to the app.

Figure 46:Notification

if a new coupon available on the app then will send to the participant notification about that, and can she/he click on it to transfer to the app.

Figure 47:New coupon notification



if a new challenge available on the app then will send to the participant notification about that, and can she/he click on it to transfer to the app.

Figure 48:New challenge notification

3.3.2 Hardware Interfaces

This application works on Android. No other hardware is required.

3.3.3 Software Interfaces

Software used	description
Operating system	The exsb system works on **Android 11.0** Operating system.
Programming language	To implement the system, we have chosen **Dart language** and **flutter library** for it supports many ready-made services.
Connections	The Exsb system connects to the **google GPS** application in order to take location data, and then the location data is used to display advertisements and events within the exsb application. It also communicates with **e-mail** for verification purposes.
Data shared across software components	The application is linked to the **Firebase database** and the information is shared between system interfaces and its updated simultaneously whenever the user connects to the Internet.
Library	**1- For firebase Database:** firebase_core: "^0.7.0" firebase_auth: "^0.20.0+1" firebase_database: "^6.0.0" fluttertoast: ^7.1.6 cloud_firestore: firebase_storage: firebase_messaging: "^8.0.0-dev.15" dio: **2- For location:** geolocator:^6.2.0 location:^3.2.4 google_maps_flutter:^1.2.0 geoflutterfire: dart_geohash: **3- For image:** image_picker: intl **4- Other library:** cupertino_icons:^1.0.1 carousel_pro:^1.0.0 http:^0.12.2

Table 11:software interfaces

3.3.4 Communications Interfaces

The system will use the WIFI or other networking hardware of the user's device through network communications services provided by the Android operating system.
Network communications capability will be used to connect to firebase database which is remote database for authentication and importing the users field that content the information.

3.4 System Features

3.4.1 Signup

a Description and Priority

The system provides this service manually to participants and Advertisers, this service allow the them to sign up by enter username, password and email in the system to use the system's services. This process has a High Priority.

b Stimulus/Response Sequences

Stimulus: Make system more efficient.

Response: Save user information in database.

c Functional Requirements

REQ-1 The system shall allow the users to register themselves as advertiser or as participant

REQ-2 The system shall allow user to registering by username, email address, phone number and password.

REQ-3 The system shall ensure if the email address and username exists in database.

REQ-4 The system shall allow participant to enter birthday

REQ-5 The system shall allow advertiser enter restaurant information: restaurants name, Commercial Registration No

REQ-6 The system shall show confirmation and thanks for sign up.

3.4.2 Sign in

a Description and Priority

The system provide this service manually to the users, Advertisers and participants, this service allows them to sign in into the system to see the other services.

b Stimulus/Response Sequences

Stimulus: participants and advertisers are able to get system services.

Response: show participants and advertiser's main page

c Functional Requirements

REQ-1 The system shall allow the participants to sign in by their email and and password

REQ-2 The system shall allow the advertisers to sign in by their email and password.

3.4.3 Specify location

a Description and Priority

The system provides this service automatically for users to specify their exact location. This process has a High Priority.

b Stimulus/Response Sequences

Stimulus: Participants want to Show events and ads to participate in event or use coupon in ads. Advertiser who wants to insert an ads.

Response: View list of events and ads for participant based on chosen location. Also, the Advertiser can insert their ads.

c Functional Requirements

REQ-1 The system shall allow user to activate his location from phone automatically from the options of the application.

REQ-2 The system shall display all offers and events at the location chosen by the user.

REQ-3 The system shall closed if the user deny the GPS.

3.4.4 Pay Packages

a Description and Priority

The Advertiser can show packages from the system and paying only one of them at time to make ads at the system. This process has a High Priority.

b Stimulus/Response Sequences

Stimulus: Advertisers who need to get ads by the exsb system

Response: show the event page

c Functional Requirements

REQ-1 The system shall show advertiser all packages at one page and all information related to it like (price - name of package - type of event - deadline) to help advertiser to choose suitable one.

REQ-2 The system shall connect between type of packages and the type of events.

REQ-3 The system shall allow advertisers to pay one package at time by insert his card number.

REQ-4 The system shall save information related to package and advertiser in the system database.

REQ-5 The system shall remove the package from advertiser account after the advertiser finish it, or when the deadline is end. and then the system shall allow the advertiser pay another package again.

REQ-6 The system shall store card information in privacy manner to avoid any risk.

3.4.5 edit personal information

a Description and Priority

The system shall allow the user to edit their personal information based on their need. This process has a medium priority.

b Stimulus/Response Sequences

Stimulus: Press the button to edit the personal information.

Response: Edit and update the personal information.

c Functional Requirements

REQ-1 The system shall give the user the authority to change his name, mobile number and password whenever he needs.

REQ-2 The system shall give the user the authority to change his location.

REQ-3 The system shall not give the user the authority to change his email because it must be unique.

REQ-4 The system shall run an automatic update after the user modifies his data

3.4.6 Watch and participate in events

a Description and Priority

The participant can show all stores with its advertisement to get coupons. also, the participant can participate in the system computations the questions and the challenges. This process has high priority.

b Stimulus/Response Sequences

Stimulus: participant need to racing (question, challenge) or get coupon

Response: Show the event, participate in question and challenge and getting the coupon.

c Functional Requirements

REQ-1 The system shall allow the users to show all event then choose type of event and participate in it to be winner.

REQ-2 The system shall allow the users to show all nearby store and get coupons by copy the code.

REQ-3 The system shall show all appeared advertisement, and the user can solve the question and store his information in winner list.

REQ-4 The system shall allow the users to participate in system challenge that appear once a while that's required physical attending and activity to win in the challenge.

REQ-5 The system shall allow the users to register in the competition or activities as a group (team challenge).

REQ-6 The system shall store the participant information and it will be chosen winners randomly or the earliest.

REQ-7 The system shall show all events in useful way that's make the users to get the information they need simply.

3.4.7 Notifications

a Description and Priority

The system provides this service automatically to the participants, this notification shows the newest adding coupon, question and challenge.

b Stimulus/Response Sequences

Stimulus: New coupon, question and challenge added to the system.

Response: View the new coupon, question and challenge and participate on it.

c Functional Requirements

REQ-1 The system should automatically generate notification to the participants in each new coupon, question and challenge are add to the system.

3.4.8 collect points

a Description and Priority

The system should allow the participants to collect a point each time they sign in or use discount coupon. This process has a medium priority.

b Stimulus/Response Sequences

Stimulus: When the first log in to the application, when use discount coupon.

Response: Add points to your account.

c Functional Requirements

REQ-1 The system should allow the participants to collect points when sign up in the first time to the system.

REQ-2 The system should allow the participants to collect point when use the discount coupon in the system.

REQ-3 The system should show a small box to notify the user when add a point to his account.

REQ-4 The system should exchange the collected points to a gift that is given by a specific party that supports it.

REQ-5 The system should specify the gift depends on the number of the collected points.

3.4.9 Add coupon, question, and challenge

a Description and Priority

The system provides this service to advertiser to add coupon, question and challenge, and pay the suitable package based on need and the balance. This process has a High Priority.

b Stimulus/Response Sequences

Stimulus: Advertiser want to add coupon, question and challenge and pay package.

Response: coupon added, Question added, challenge added and pay package.

c Functional Requirements

REQ-1 The system shall allow the advertiser to add coupon (the discount value and the code of coupon).

REQ-2 The system shall allow the advertiser to pay gold package to add question.

REQ-3 The system shall check the balance before add question.

REQ-4 The system shall allow the advertiser to insert true or false question and the date.

REQ-4 The system shall save the information of the winner in the question in table for winner

REQ-5 The system shall allow the advertiser to pay diamond package to add challenge.

REQ-6 The system shall check the balance before add challenge.

REQ-7 The system shall allow the advertiser to insert the description of the challenge and the date and time.

REQ-8 The system shall save the information of the winner in the challenge in table for winner.

3.4.10 allows the administrator to insert, modify, or delete after signing in the system

a Description and Priority

The system provides this service to allow insert, modify or delete data in the system This process has a High Priority.

b Stimulus/Response Sequences

Stimulus: need of administrate the system

Response: modify system data

c Functional Requirements

REQ-1 The system shall be able to check the authentication of the administrator before allowing them to access the database.

REQ-2 The system shall allow the administrator to insert, modify or delete.

3.5 Other Non-functional Requirements

3.6 Performance Requirements

1- Participants in system events

1.1 The system events should be noticeable and easy to find in app

1.2 The system events should be easy and to add

1.3 The system events should be easy to participate in

2- Setting in the system

2.1 the modification in the system events should be easy.

2.2 the modifications in data base take less than a 2 second

3- Error message in the system

3.1 the system should display an error message to notify the users In 1 second.

4- validation and authentication in the system

4.1 The system should Validate the users email take less than 2 second after pressing the links

4.2 The system should Authentic the users when they sign in seconds.

3.7 Safety Requirements

1- The system uses minimal strain on battery life.

2- The system is free from malicious code

3- The system has Adequate safeguards are in place to protect privacy, confidentiality

5- The system Securely supports identity management

6- Sensitive data isn’t distributed among third party mediators.

7- No sensitive data in backups.

8- Sensitive data is not stored on another place outside the app’s system database (cloud firebase).

9- Update the app to fill potential gaps, adding improvements to the application and modifying services.

3.8 Security Requirements

1-The system should send verification messages to its e-mail to ensure that the user is not fake.

2-If the user wants to create an account and his username or email is exists, the system should show a message to choose another email.

3-The user should be sign up and sign in to use the system's services.

4-The system should ask the participant to allow to use his location to display nearby store from him when using the system and the user can refusal that.

5- All passwords are encrypted due firebase authentication.

6- when the user wants to change password, the system should send verification messages to its e-mail to increase privacy and security.

3.9 Software Quality Attributes

1- Availability

1.1-The system should be available at all times and its functionality to be able to respond to requests.

1.2-The system shall be robustness, and if fail shall be recovered quickly.

1.3-The system should be available after the participant allow to specify his location and show all system functionality

2-Usability

The system should be easy to use by users after 2 hours training and should be organized in such a way that user errors are minimized.

3.10 Business Rules

All stores must be authorized, and the advertiser must have a commercial register and as well as having credibility in the discount is provided

CHAPTER 4

SOFTWARE DESIGN

1 Design Overview

1.1 Introduction

Exsb software design will be client server architecture, and we will use the flutter and dark language. And the environments which the application will run on it. Also, will discuss the Constraints and Assumptions of our application. And this chapter contains will find the system interface, ERD, class, sequence and activity diagrams.

1.2 Environment Overview

Exsb software will run in all environment (IOS, android), this application will reside in Umm Al Qura University and it will be executed by a group of student as a graduation project.

1.3 System Architecture

we choose **client-server architecture** as a architecture to our system because it has benefits support to our system:

1) Centralization: in client server network architecture there is a centralized control. Servers help in administering the whole set-up and also accessing rights and allocating resource is done by Servers.

2) Proper Management: Since all the files are stored at the same place management of files becomes easy making it easier to find files.

3) Back-up and Recovery possible: Making a back-up of all the data is easy as the data is stored on server.

4) Up-gradation and Scalability in Client-server set-up: If we want to make changes you will need to simply upgrade the server. Additionally, you can add new resources and systems by making necessary changes in server.

5) Accessibility: From various platforms in the network, server can be accessed remotely.

6) As new information is uploaded in database, each workstation need not have its own storage capacities increased. All the changes are made only in central computer on which server database exists.

7) Security: Rules defining security and access rights can be defined at the time of set-up of server.

1.4 Constraints and Assumptions

Constraints:

1- The operating system versions must support the operation of the application.

2- A good internet connection must be available as most services can only activate with a good connection.

3- The mobile version must support GPS technology because the application's activities depend on the location.

4- The interfaces must be easy and clear to the user, which makes him get the information easily.

6- Our app does not violate any security, legal or ethical standards.

Assumptions:

1- the cell phones must have sufficient efficiency; it will still be used. If the handset may not have adequate hardware resources available for the application for example, other applications may have been reserved by users, there may be situations where the application does not function as planned or even at all.

2- It is assumed that the users are aware of the period of use of the coupon or receiving the gift. As well as the duration of use of the packages.

2 Interfaces and Data Stores

2.1 System Interfaces

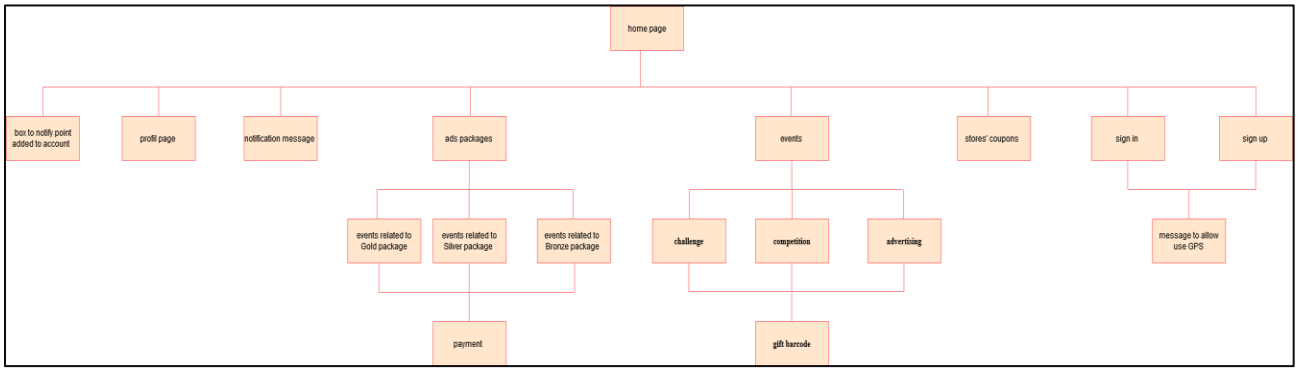


Figure 49 System Interfaces

2.2 Data Stores

Firebase is Google's mobile application development platform and toolset to "build, improve, and grow apps", and the tools it gives cover a large portion of the services that developers would normally have to build themselves, This includes things like analytics, authentication, databases, configuration, file storage, push messaging, and the list goes on. The services are hosted in the cloud, and scale with little to no effort on the part of the developer. hosted in the cloud mean that the products have backend components that are fully maintained and operated by Google. Client SDKs provided by Firebase interact with these backend services directly, with no need to establish any middleware between app and the service.

Firebase is non-SQL database and it stores data within "documents", which are contained within "collections". Documents can also contain nested collections. Our project has many documents and it is:

Advertisers: First name, Last name, Balance, Email, Phone number, Store name, Location, commercial umber.

Participants: First name, Last name, Points, Email, Phone number, Location, Birthday.

Coupons: Coupon name, Discount value, Store name, Store Location, user ID.

Questions: advertiser Question, Question answer, Store name, Store Location, user ID.

Challenges Part: Challenge name, Challenge description, Challenge date, Store name, Store location.

Package: Package name, Description.

Winners: First name, Last name, email, user ID.

3 Structural Design

3.1.1 Class Diagram

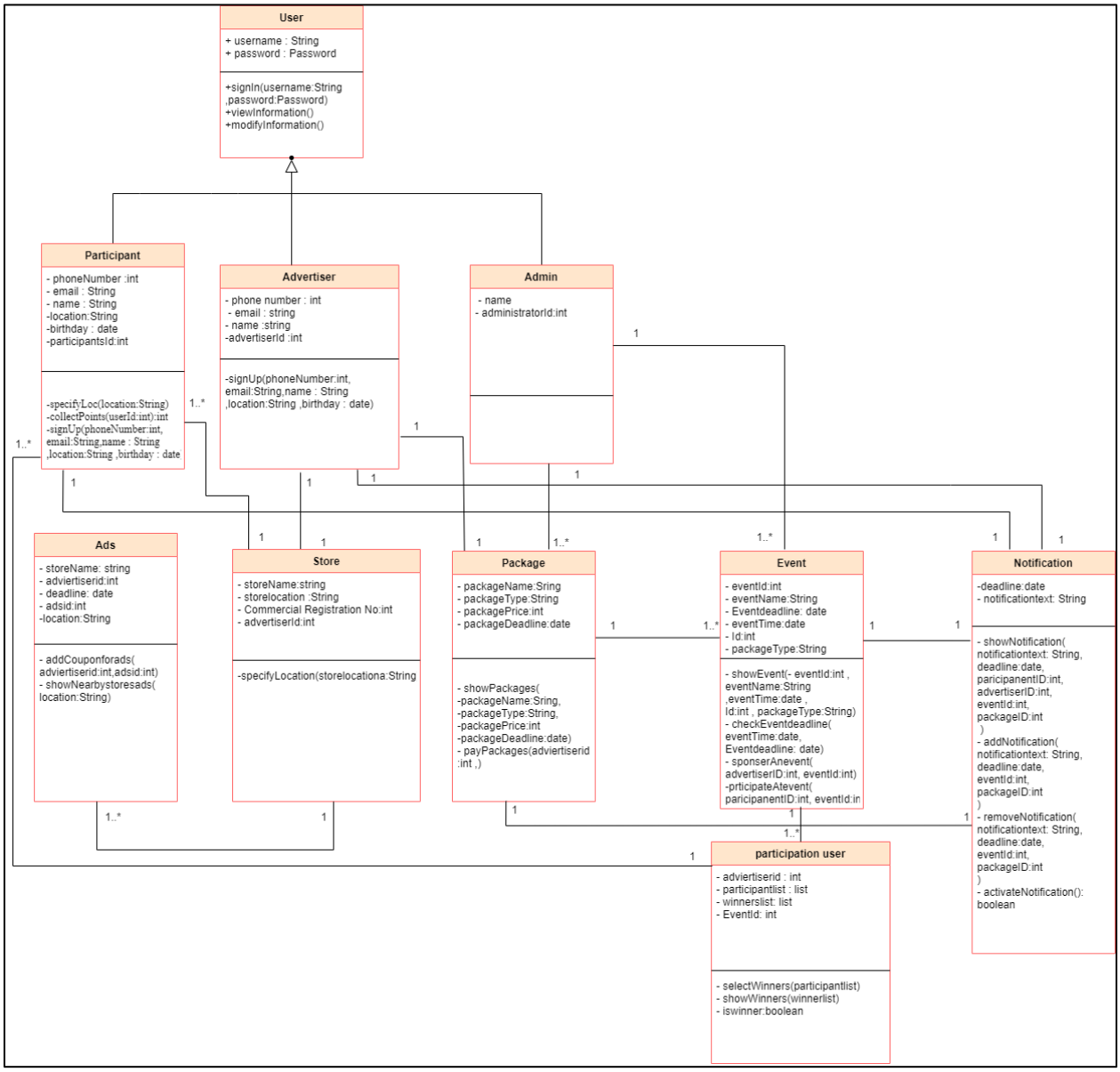


Figure 50 Class Diagram

3.2.1 Sequence diagram

1- SIGNUP SEQENCE

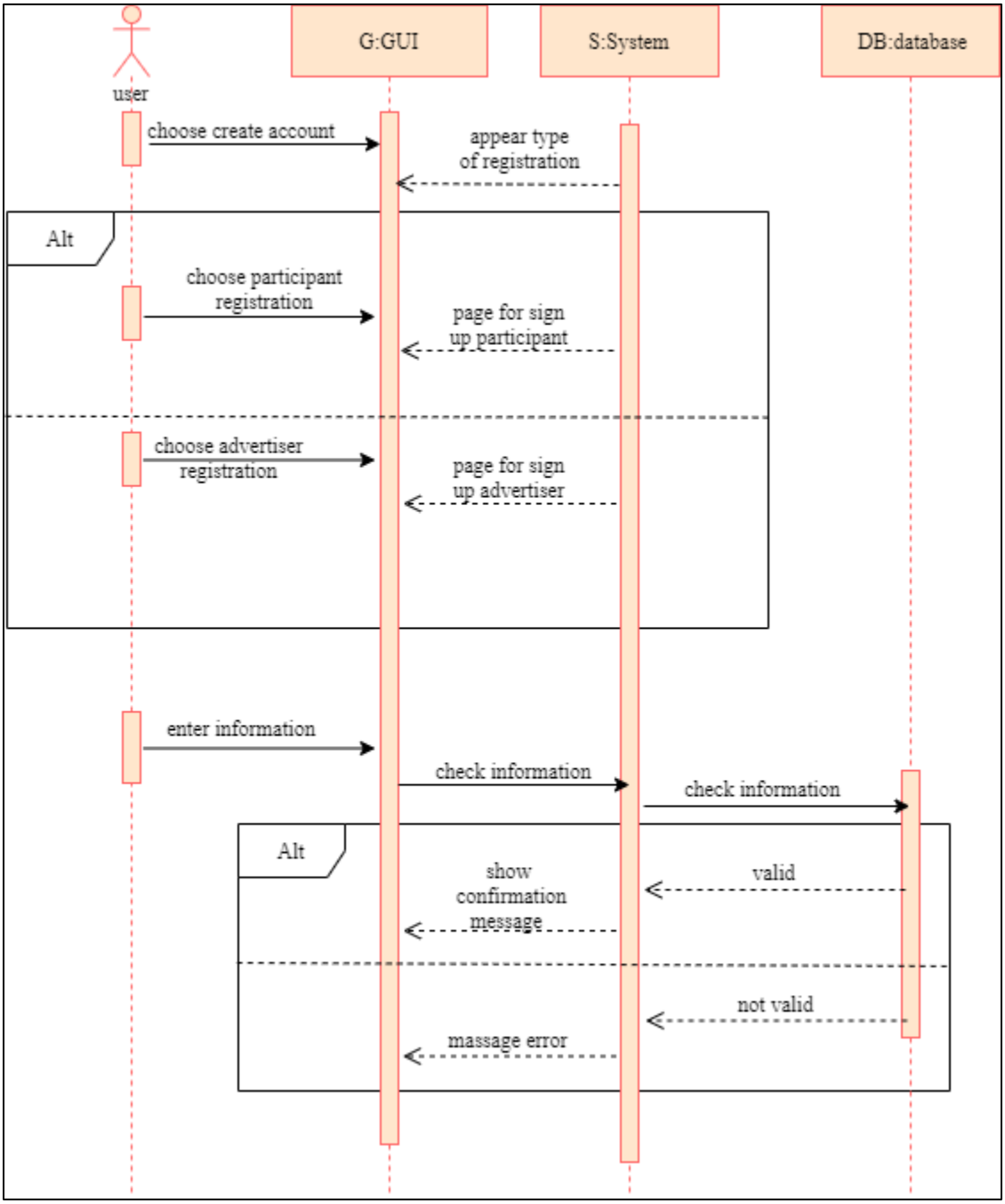


Figure 51 SIGNUP SEQENCE

2-SIGN IN SEQENCE

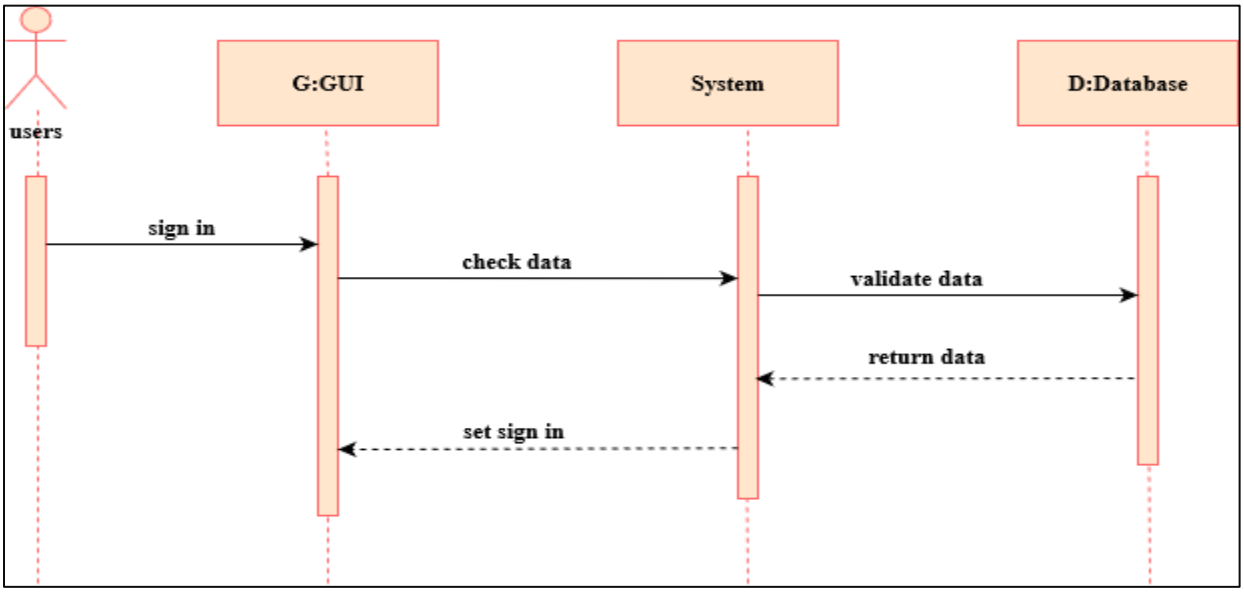


Figure 52 SIGN IN SEQENCE

3- SECIFY LOCATION SEQENCE

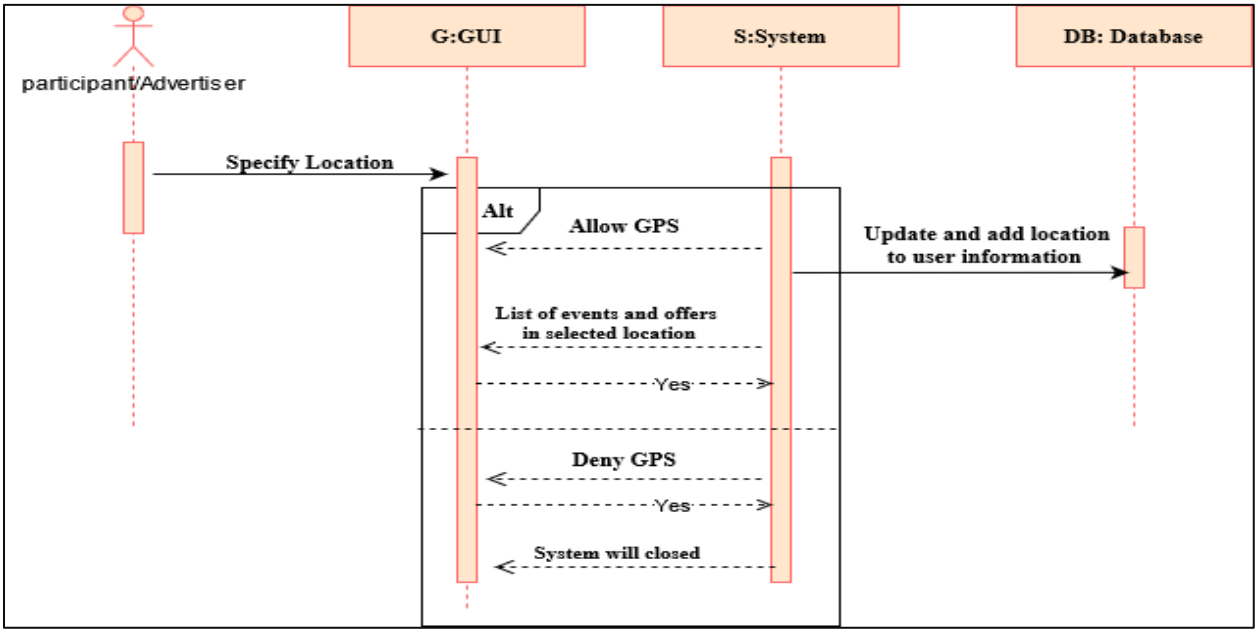


Figure 53 SECIFY LOCATION SEQENCE

4.PACKAGES SEQENCE

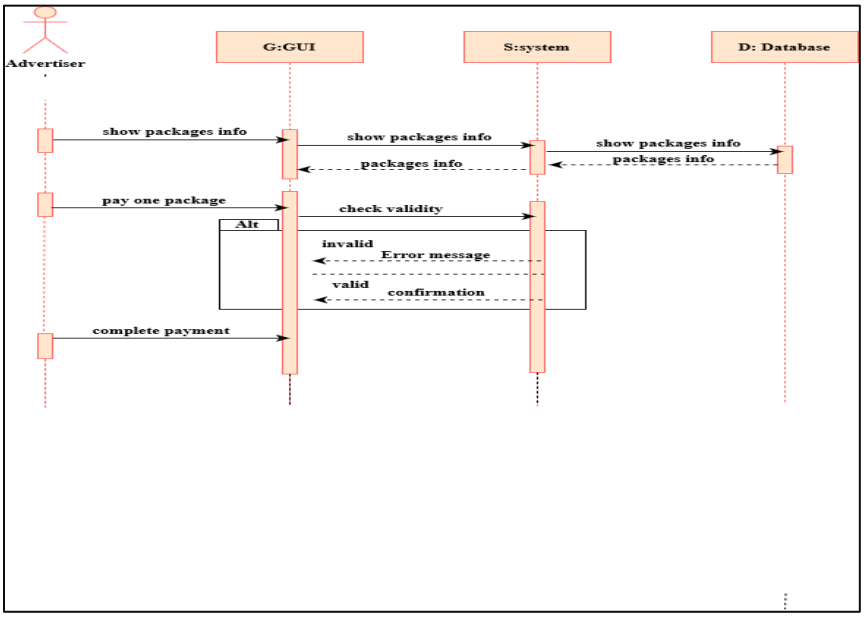


Figure 54 PACKAGES SEQENCE

5- EDIT PERSONAL INFORMATION SEQENCE

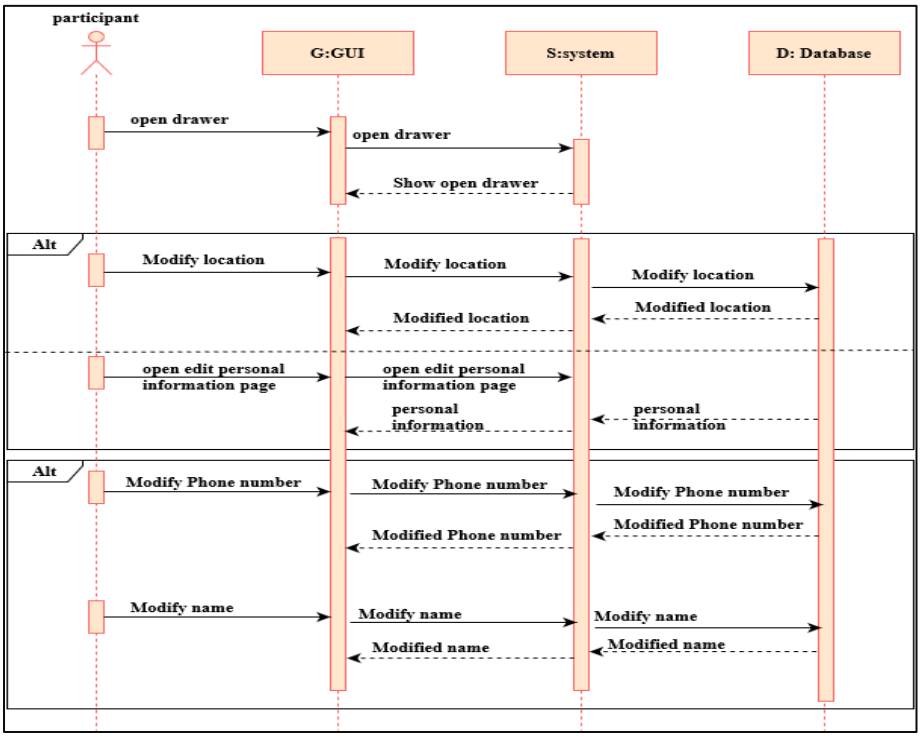


Figure 55 EDIT PERSONAL INFORMATION SEQENCE

6- PARTICIPANTS SHOW EVENTS TO PARTICIPATE SEQENCE

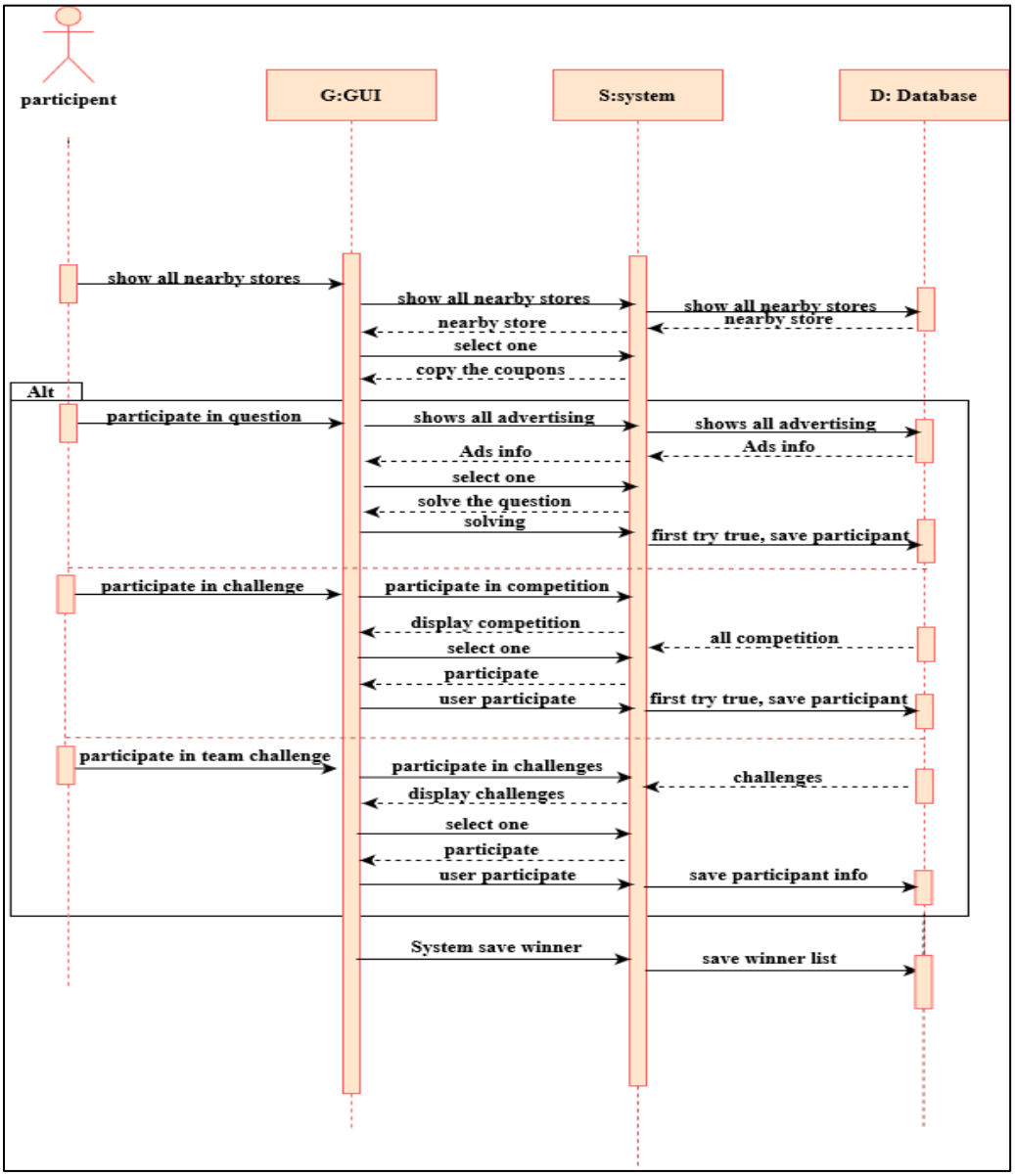


Figure 56 PARTICIPANTS SHOW EVENTS TO PARTICIPATE SEQENCE

7- NOTIFICATION SEQENCE

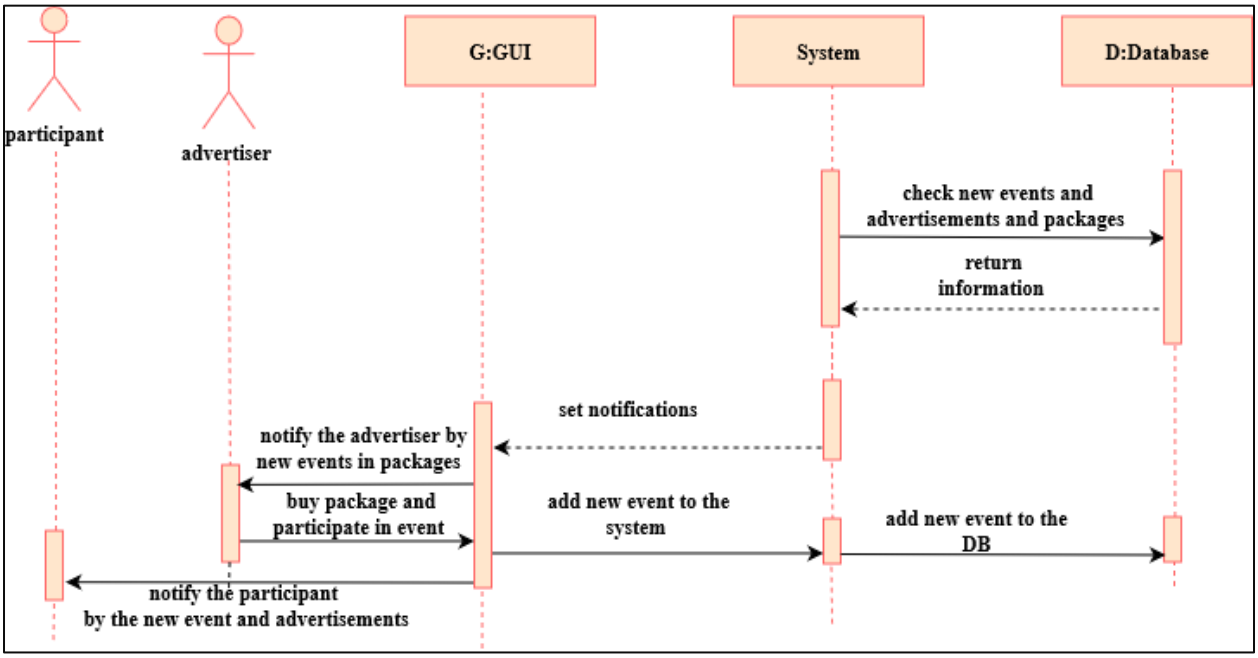


Figure 57 NOTIFICATION SEQENCE

8- COLLECT POINTS SEQENCE

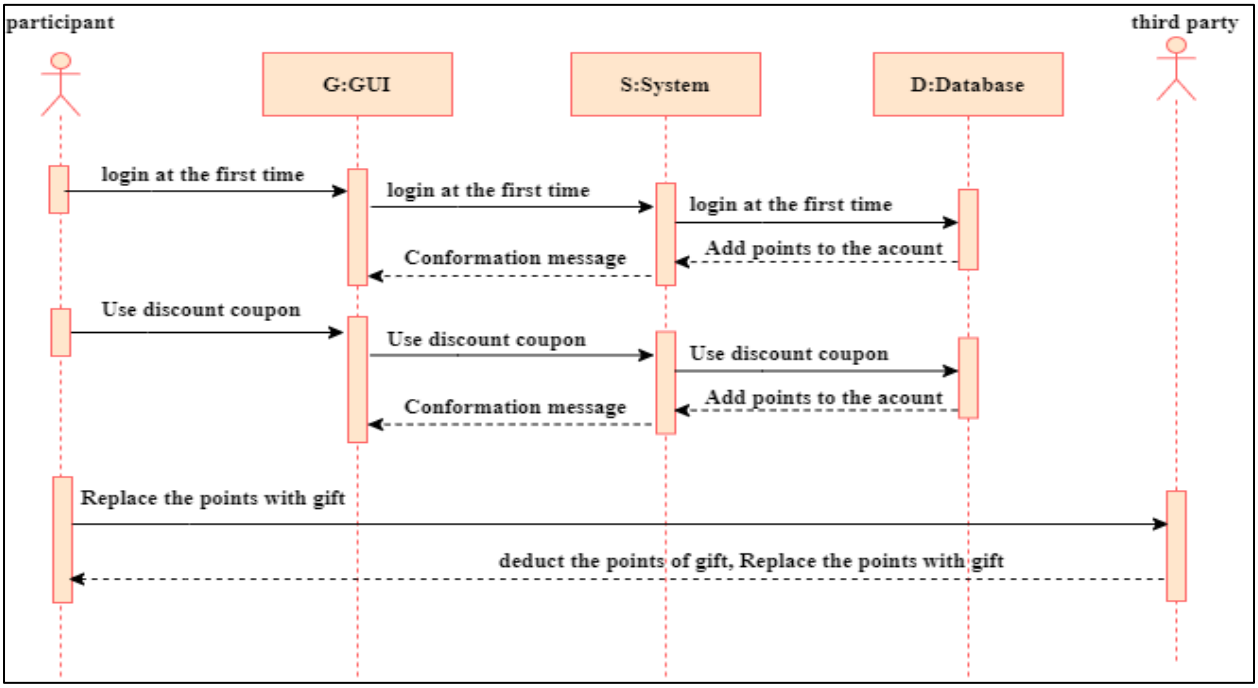


Figure 58 COLLECT POINTS SEQENCE

9- ADVERTISER SHOW EVENT TO SPONSER SEQENCE

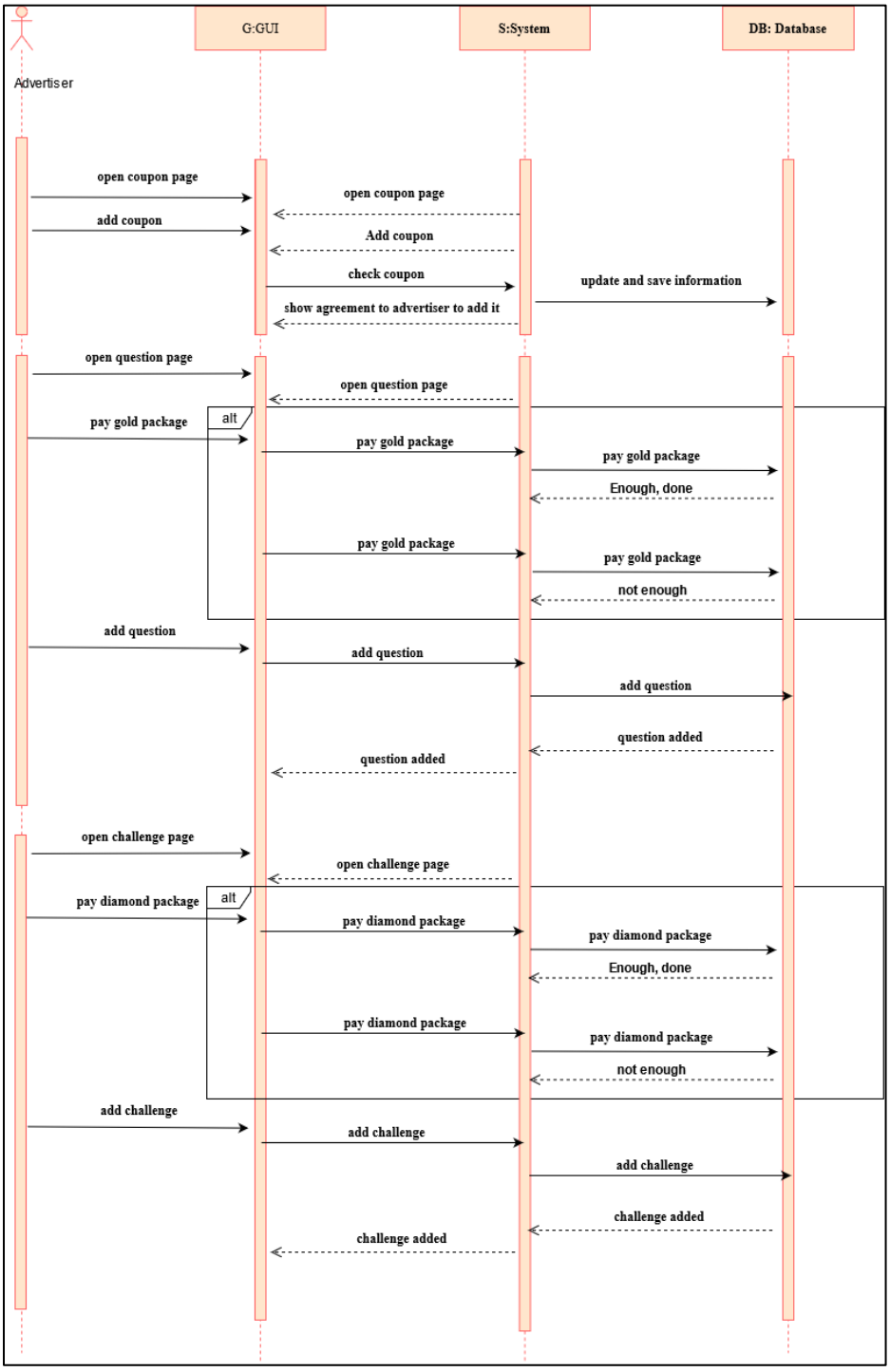


Figure 59 ADVERTISER SHOW EVENT TO SPONSER SEQENCE

10- ADMINISTRATOR EDIT ,ADD,DELETE, IN SYSTEM SEQENCE

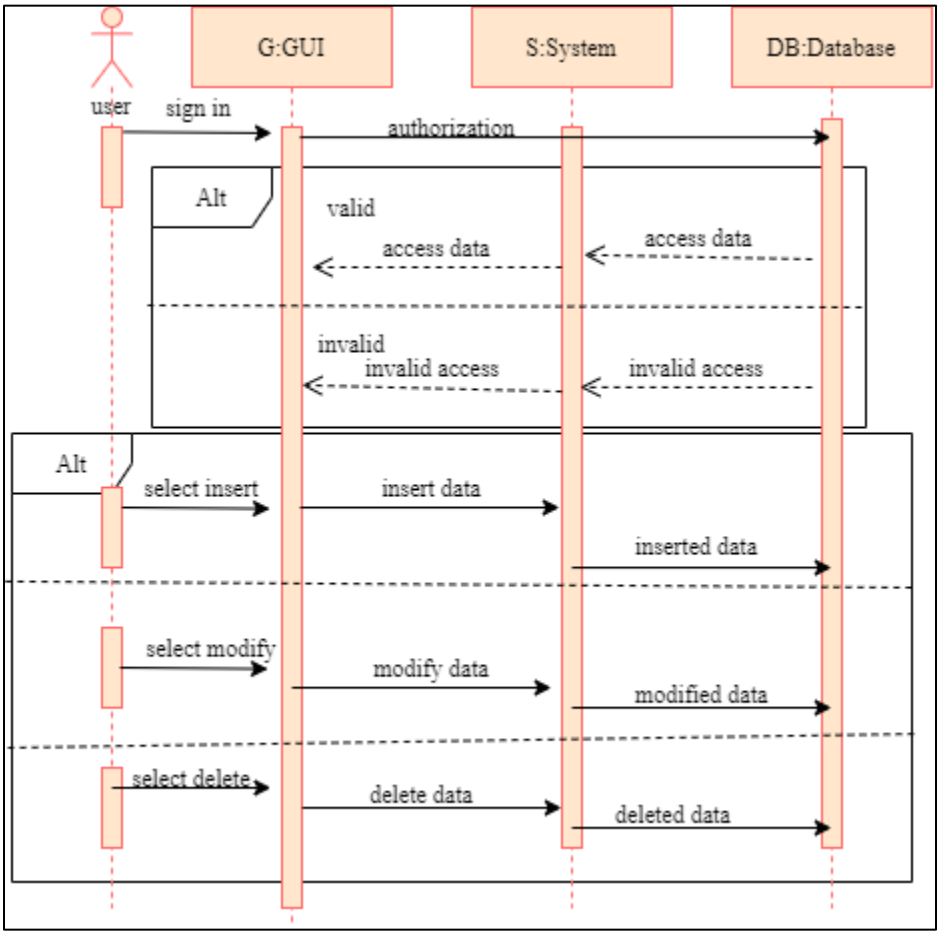


Figure 60 ADMINISTRATOR EDIT ,ADD,DELETE, IN SYSTEM SEQENCE

3.2.2 Activity diagrams

1- SIGNUP Activity

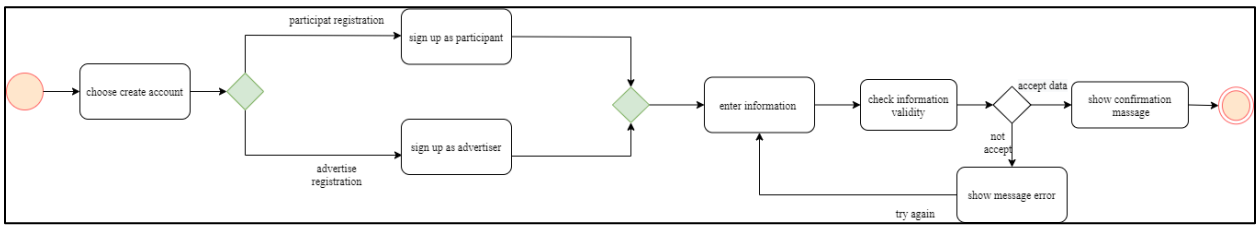


Figure 61 SIGNUP Activity

2-SIGN IN Activity

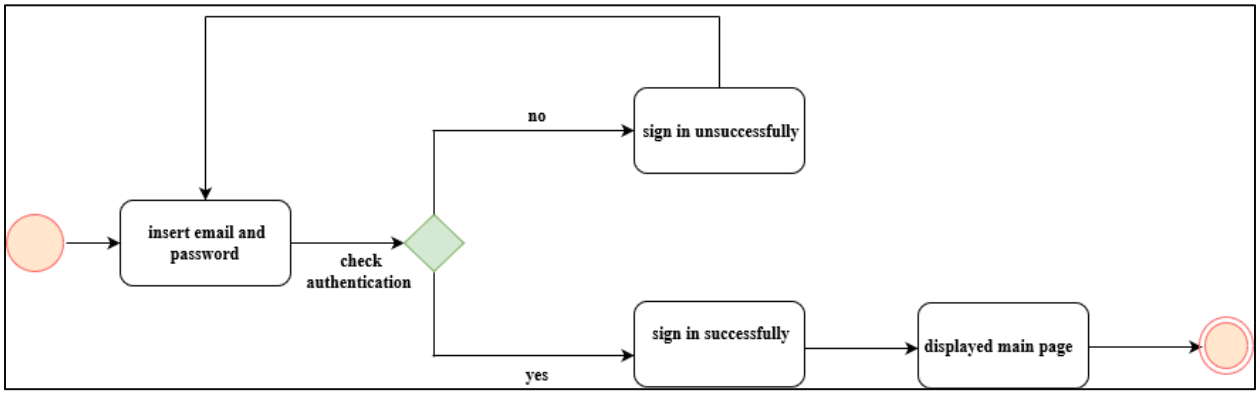


Figure 62 SIGN IN Activity

3- SECIFY LOCATION Activity

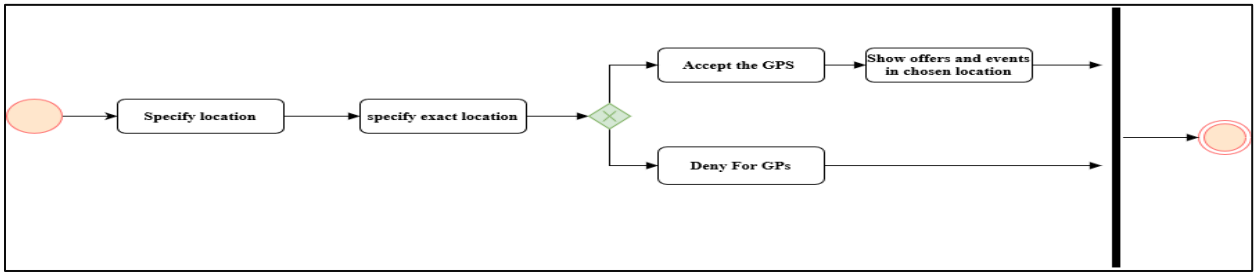


Figure 63 SECIFY LOCATION Activity

4.PACKAGES Activity

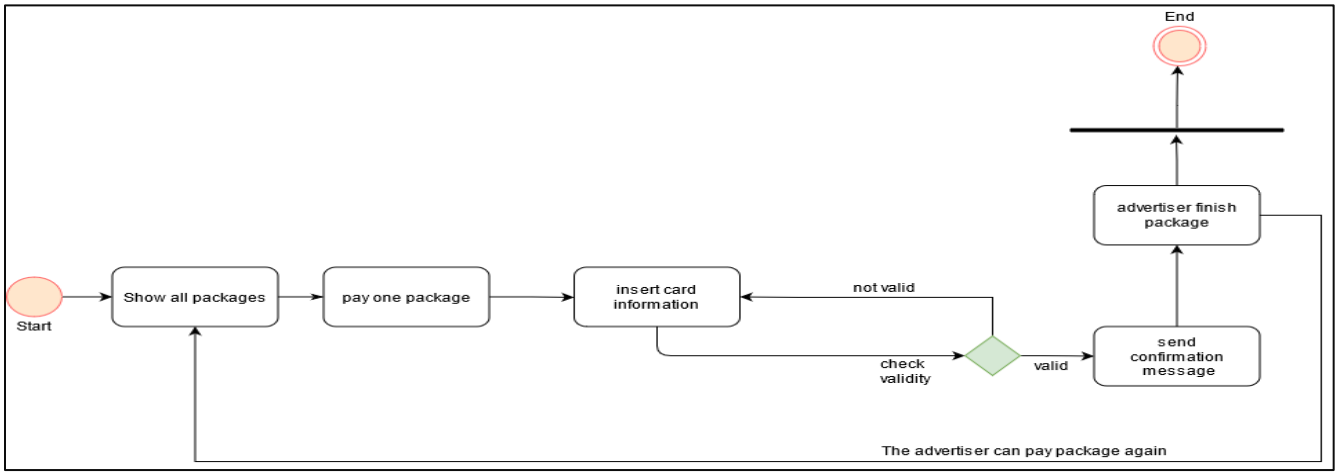


Figure 64 PACKAGES Activity

5- EDIT PERSONAL INFORMATION Activity

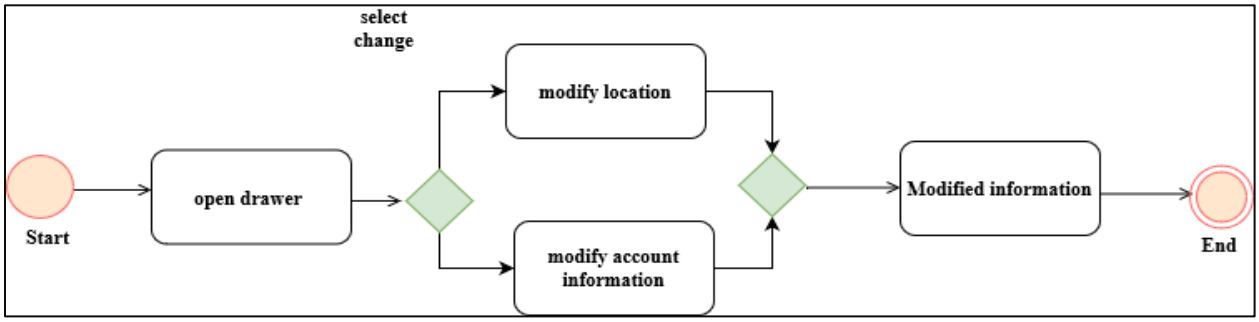


Figure 65 EDIT PERSONAL INFORMATION Activity

6- PARTICIPANTS SHOW EVENTS TO PARTICIPATE Activity

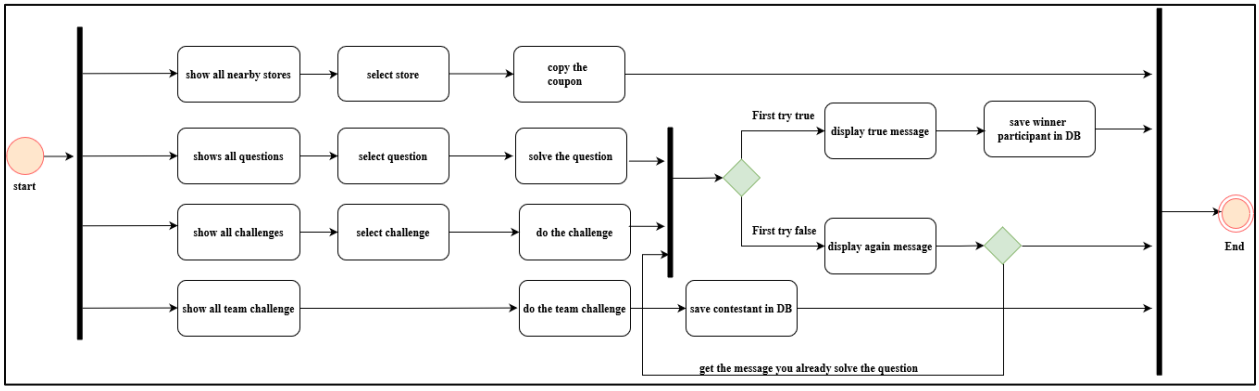


Figure 66 PARTICIPANTS SHOW EVENTS TO PARTICIPATE Activity

7- NOTIFICATION Activity

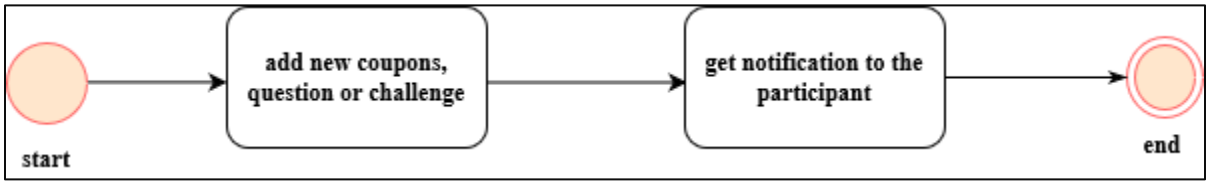


Figure 67 NOTIFICATION Activity

8- COLLECT POINTS Activity

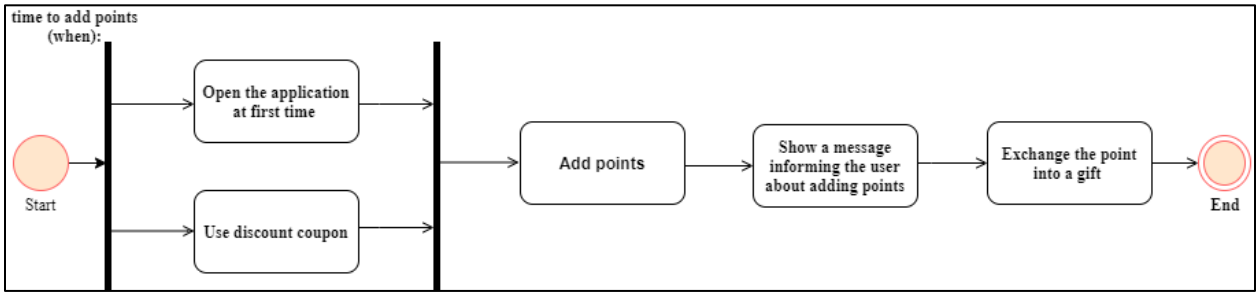


Figure 68 COLLECT POINTS Activity

9- ADVERTISER SHOW EVENT TO SPONSER Activity

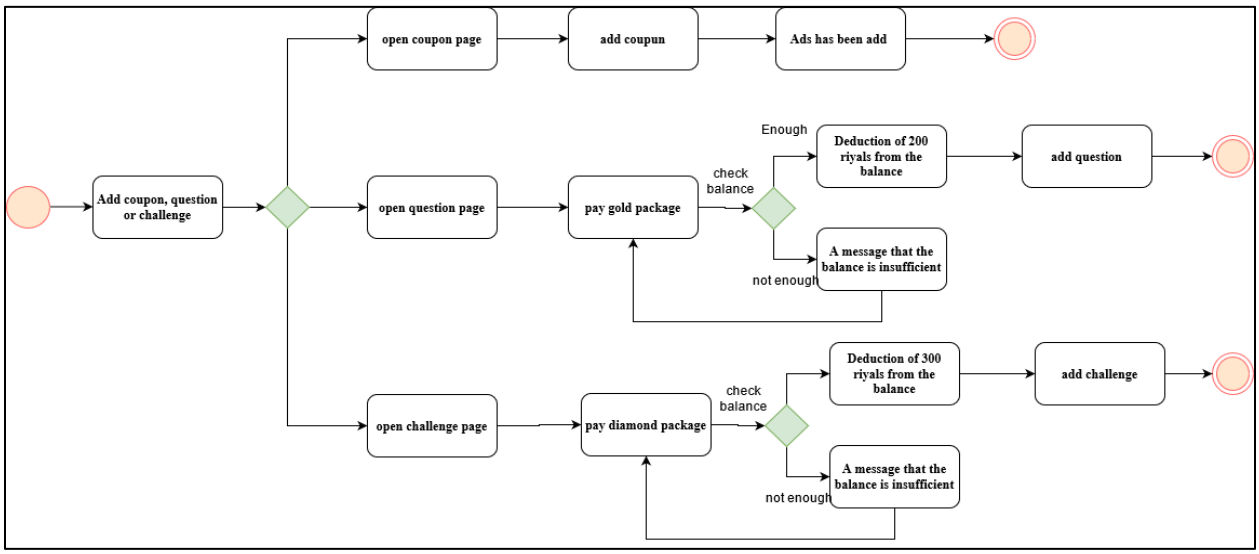


Figure 69 ADVERTISER SHOW EVENT TO SPONSER Activity

10- ADMINISTRATOR EDIT ,ADD,DELETE, IN SYSTEM Activity

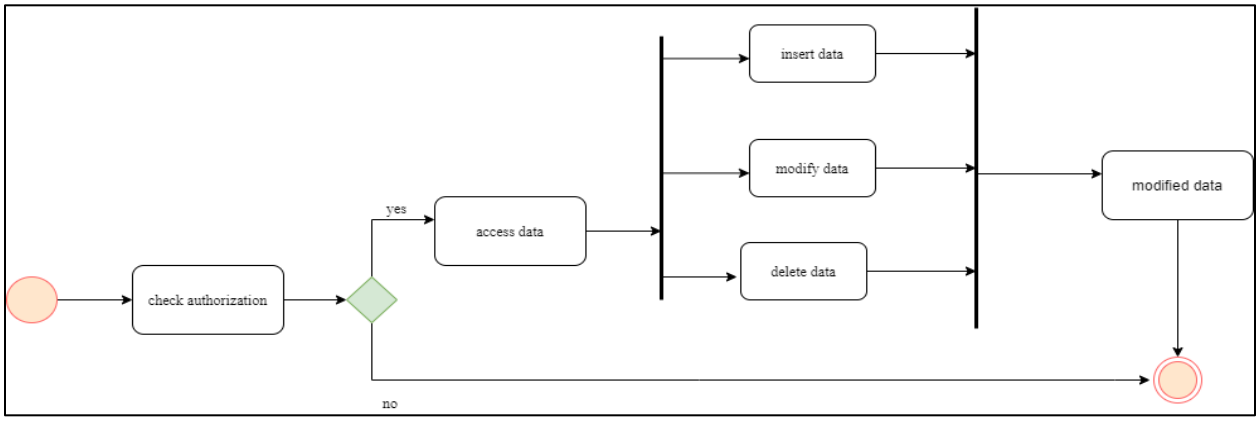


Figure 70 ADMINISTRATOR EDIT ,ADD,DELETE, IN SYSTEM Activity

4 ER diagram and relation schema

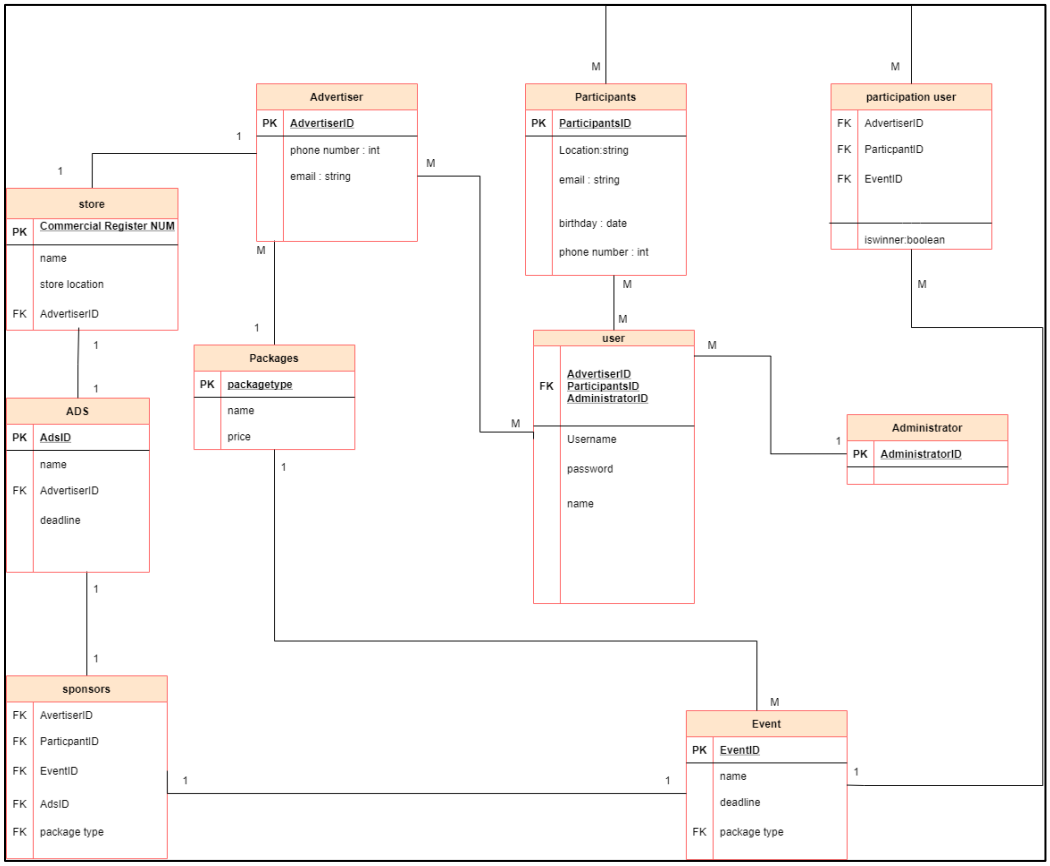


Figure 71 ER diagram and relation schema

CHAPTER 5

SYSTEM IMPLEMENTATION & VALIDATION

5.0 Introduction

This chapter summarizes the most important Exsb application aspects of implementing that consist of two parts, design and programming in details , and testing that is about validate all systems inputs with the alerts messages as well as, the used hardware and software needed to accomplish everything in the Exsb system.

5.1 Used software and Hardware

Software:

Operating system:

The exsb system works on Android 11.0 Operating system.

Programming language:

To implement the system, we have chosen Dart language and flutter library for it supports many ready-made services.

Connections:

The Exsb system connects to the google GPS application in order to take location data, and then the location data is used to display advertisements and events within the exsb application. It also communicates with e-mail for verification purposes.

Data shared across software components:

The application is linked to the Firebase database and the information is shared between system interfaces and its updated simultaneously whenever the user connects to the Internet.

Library:

1-For firebase Database:

firebase_core: "^0.7.0"

firebase_auth: "^0.20.0+1"

firebase_database: "^6.0.0"

fluttertoast: ^7.1.6

cloud_firestore:

firebase_storage:

firebase_messaging: "^8.0.0-dev.15"

2-For location:

geolocator:^6.2.0

location:^3.2.4

google_maps_flutter:^1.2.0

geoflutterfire:

dart_geohash:

3-For image:

image_picker:

4-Other library:

cupertino_icons:^1.0.1

carousel_pro:^1.0.0

Hardware:

This application works on Android. No other hardware is required.

5.2 Important pseudocodes or flowcharts

In this section, list the pseudocodes of flowcharts of essential codes. Do not list the original codes.

If your codes do not present important functional code, please ignore this section, and list the codes in the appendices.

5.3 Implemented software

The implementation of the application consisted of two parts design and programming, the design processes included the interfaces and how to move between the parts of the application. We applied the concepts of user experience and user interface that were previously studied so that the user reaches the goal with the least possible effort, easily and effectively. During the design phase, we made sure to clarify all parts of the application by inserting images and icons,

and explanatory texts for each part. We used flutter libraries to work more efficiently, such as Media Query.

In the programming phase, we were keen to sequence the program as a logical sequence free of errors and perform the required functions with good efficiency in order to suit the users. We tried to test each part of code (method or class) before linking it with the hole or other of the application services.

In exchanging codes between team members, we used GitHub.

In the learning stage of programming and program implementation we relied on reliable sources Flutter documentation, YouTube, stack overflow and the educational telegram channels.

Searching for the best code and a good way to write the codes and formulate a method, and make sure that the code is correct before adding it to the project.

Simple code:

```
Geoflutterfire geo = Geoflutterfire();
GeoFirePoint myLocation;
Future<GeoFirePoint> _getUserLocation() async {
  final CollectionReference par = firestore.collection("Participants");
  DocumentReference documentReference = par.doc(auth.currentUser.uid);
  GeoFirePoint point0;
  await documentReference.get().then((DocumentSnapshot snap) {
    if (snap.exists) {
      var fireBase = snap.data()['location'];
      point0 = geo.point(
          latitude: double.parse('${fireBase.latitude}'),
          longitude: double.parse('${fireBase.longitude}'));
    }
  });
  setState(() {
    myLocation = point0;
  });
}
```

Figure 72:Simple code

5.4 Testing methodology & results

Testing:

UNIT TESTING is a type of software testing where individual units or components of a software are tested. The purpose is to validate that each unit of the software code performs as expected. Unit Testing is done during the development (coding phase) of an application by the developers. Unit Tests isolate a section of code and verify its correctness. A unit may be an individual function, method, procedure, module, or object.

So, we test each class and method induvial and be sure its work correctly then add it to the whole project.

Black Box Testing is a software testing method in which the functionalities of software applications are tested without having knowledge of internal code structure, implementation details and internal paths. Black Box Testing mainly focuses on input and output of software applications and it is entirely based on software requirements and specifications. It is also known as Behavioral Testing.

We use some test case and with different type of inputs to test our application, and compare the expected result with actual result.

Acceptance Testing a testing technique performed to determine whether or not the software system has met the requirement specifications. The main purpose of this test is to evaluate the system's compliance with the business requirements and verify if it is having met the required criteria for delivery to end users.

We give our application to actual user to use the application and test all requirement specifications, and monitor the behaviors and the acceptance level.

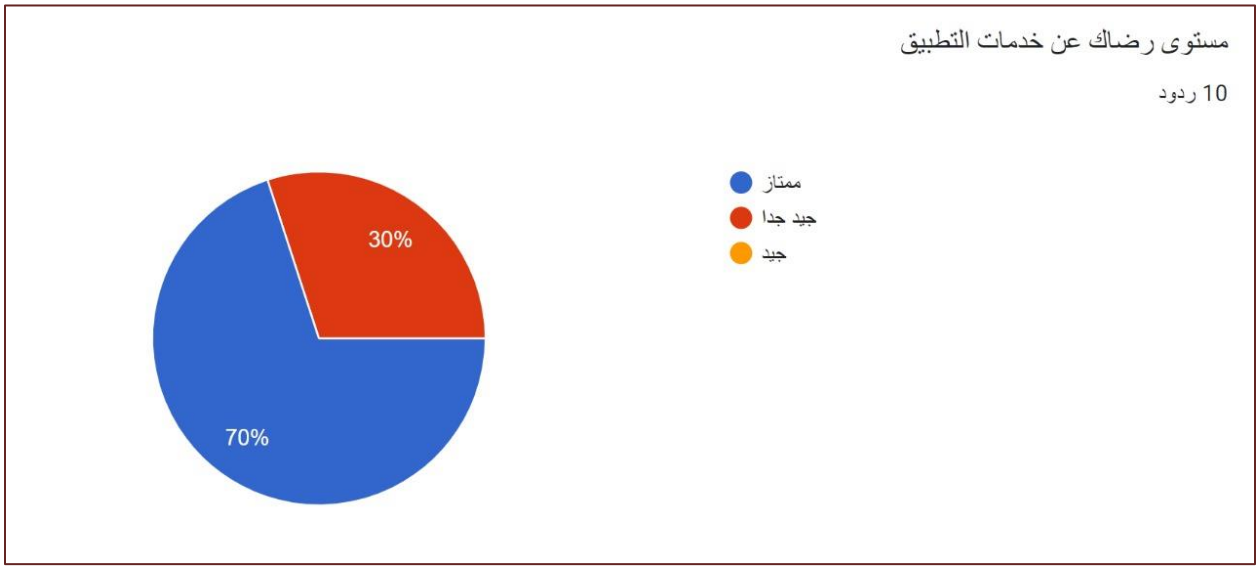


Figure 73:Your level of satisfaction with the application services?

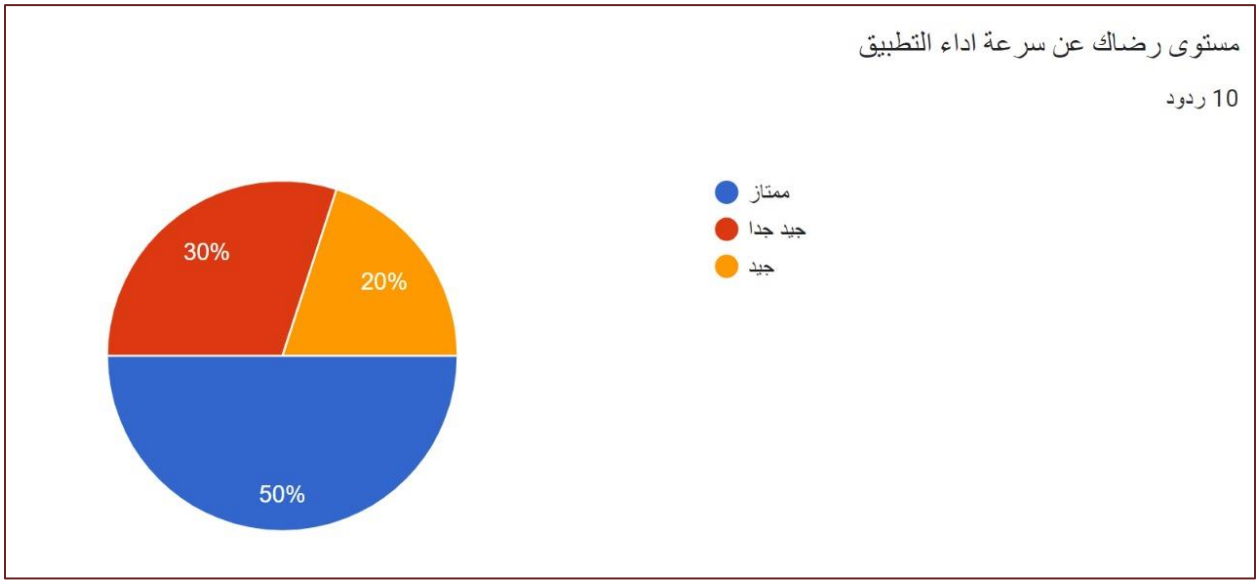


Figure 74:Your level of satisfaction with the speed of application performance?

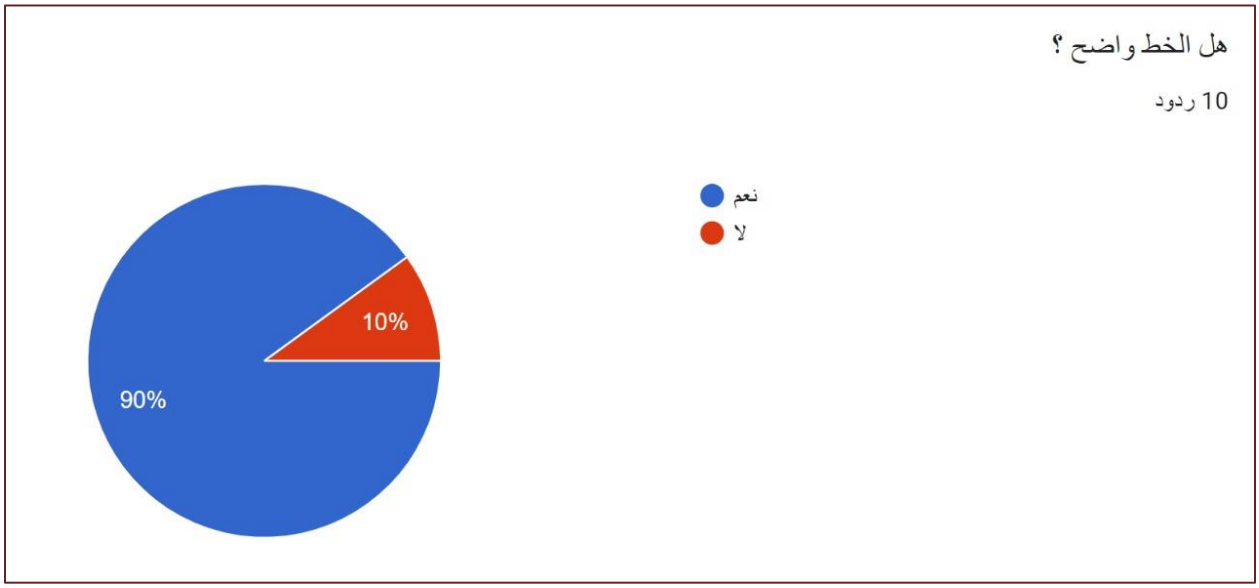


Figure 75:Is the writing clear?

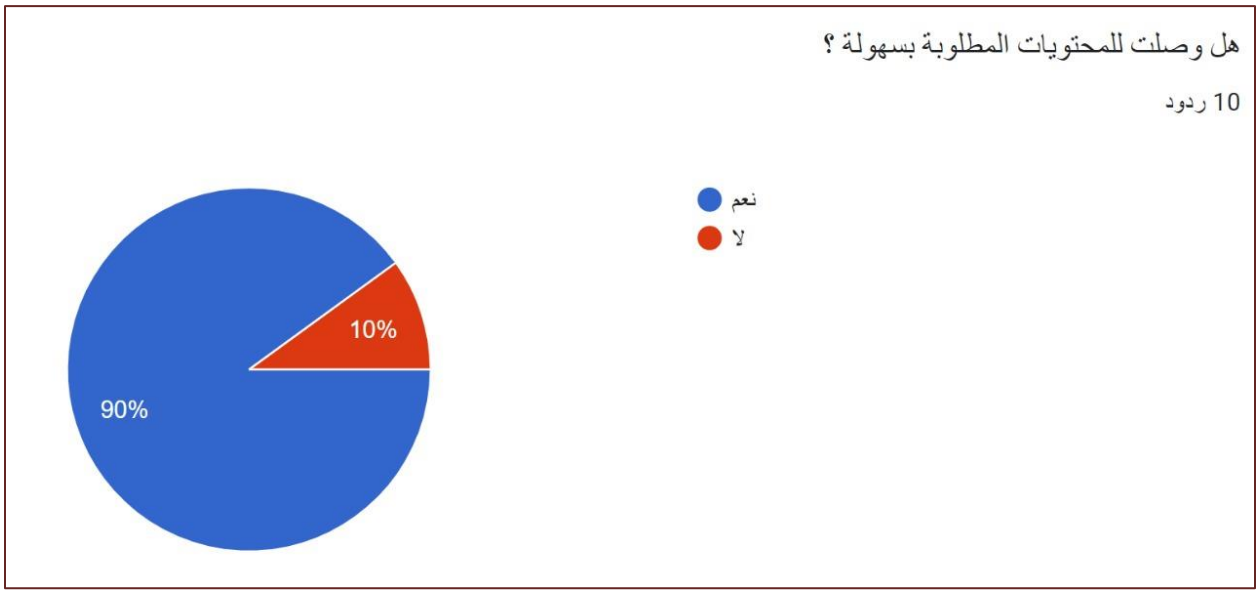


Figure 76:Did you easily reach the required contents?

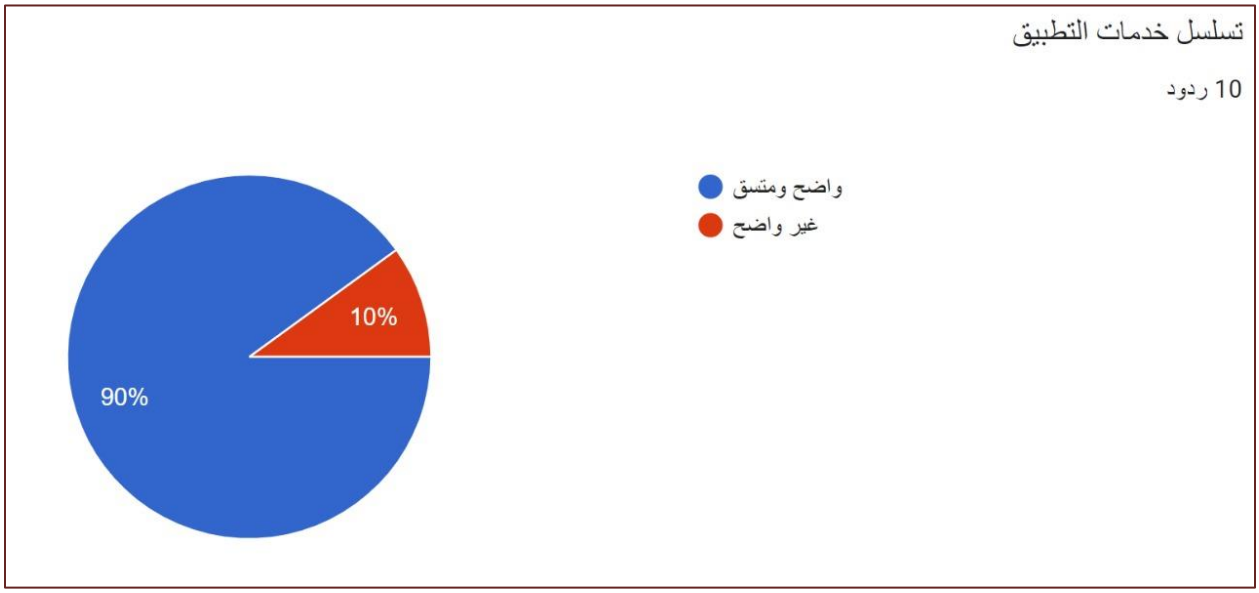


Figure 77:Sequence of application services?

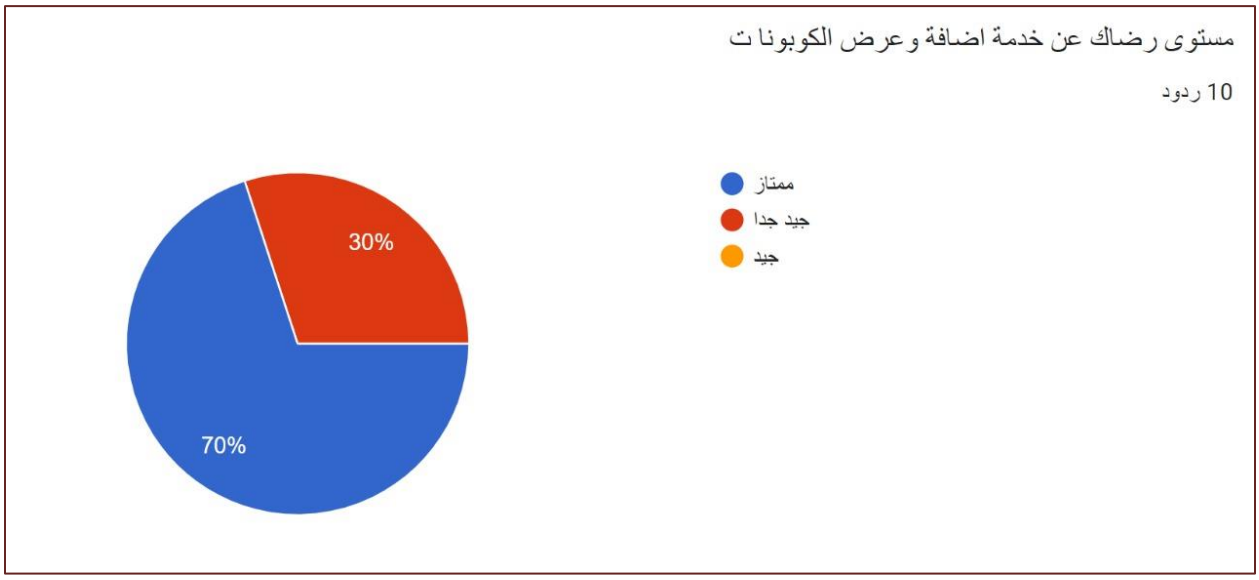


Figure 78:The level of your satisfaction with the coupon addition and presentation service?

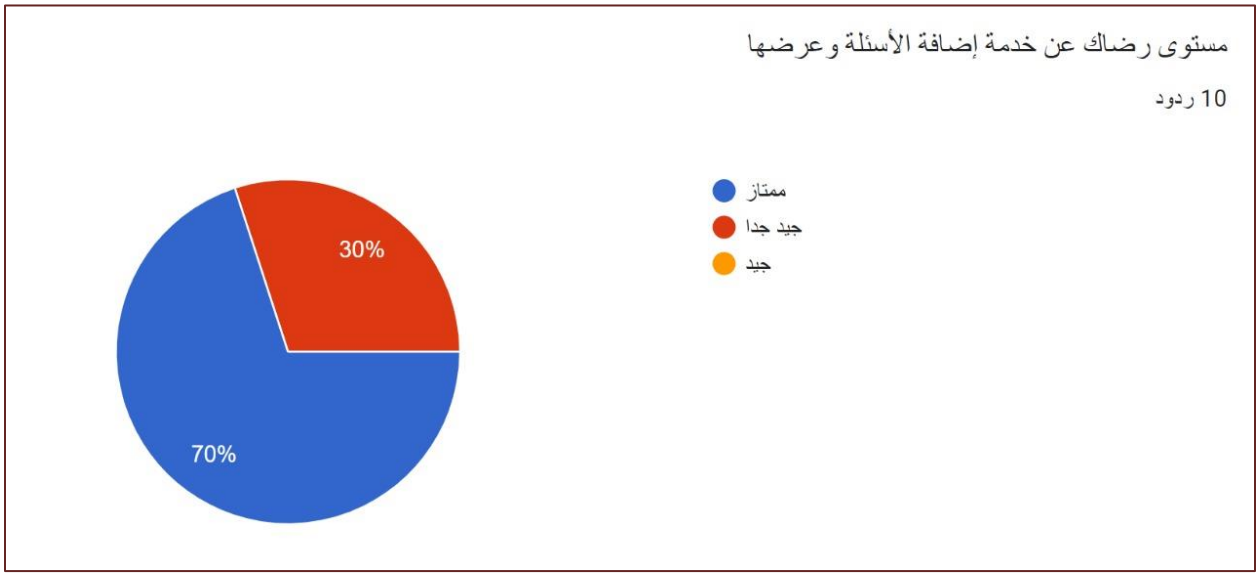


Figure 79:Your level of satisfaction with the service of adding and viewing questions?

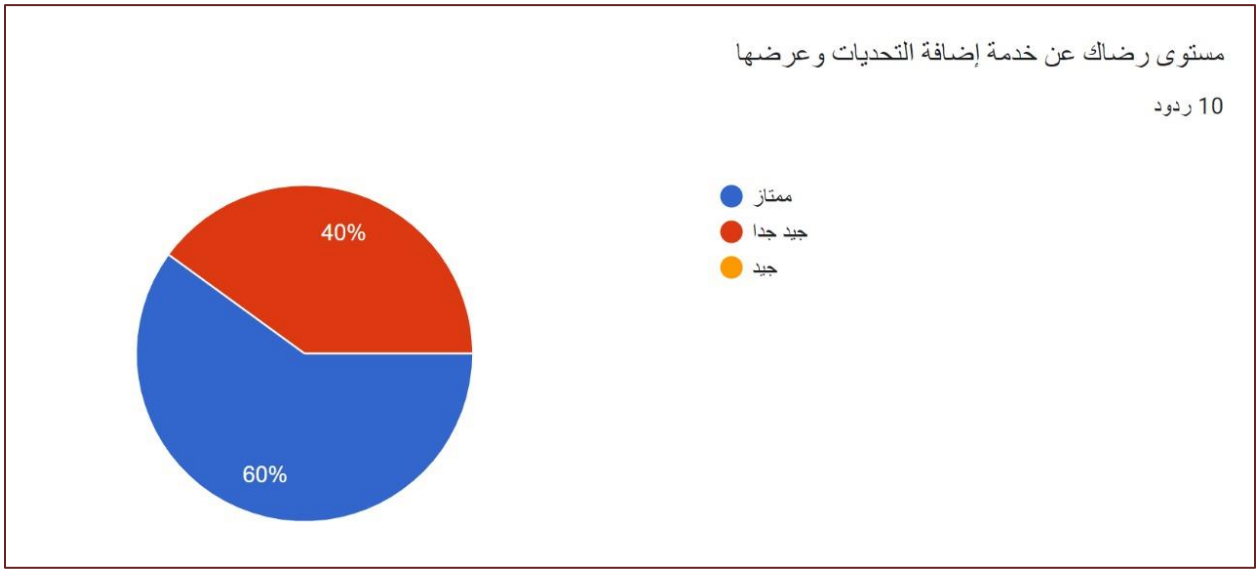
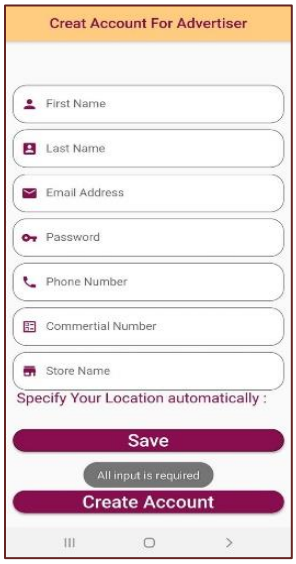


Figure 80:Your level of satisfaction with the service of adding and presenting challenges?

Figure 81:Other suggestions

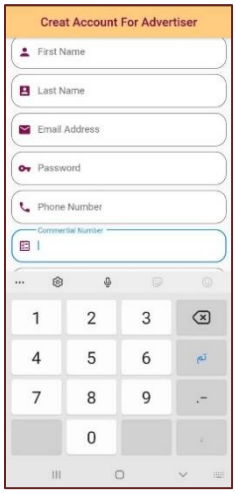
5.5 Input validation:

The validation and testing include condition on all user input to check the type and length. We tried many inputs to test our application like type letter rather than number, so you will get a massage tell you to type a correct input format. And we use a special keyboard for entering numbers which give you numbers only to type. And a special keyboard for entering letters to reducing the percentage of entering a different data type. If you copy and paste data to a different location, a message appears informing you to enter correct information. If you do not enter any information, a message will appear informing you that all the information is required to be entered. The first name and last name should be a letter only, the email address should use Gmail only, the password should length at least seven character, the phone number should start with 05 and contain ten numbers, the commercial number should contain only numbers, the discount value should contain only two numbers and the discount code should contain five characters.



If you do not enter any information, a message will appear informing you that all the information is required to be entered.

Figure 82:Input validation1



We use a special keyboard for entering numbers which give you numbers only to type

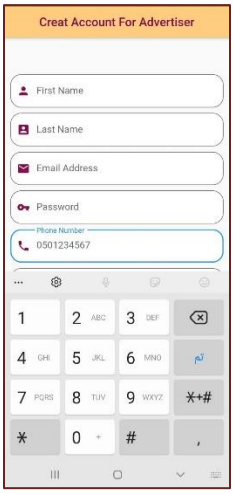


Figure 84:Input validation2

Figure 83:Input validation3

Figure 85:Input validation4

The discount value should contain only two numbers and the discount code should contain five characters.

Figure 86:Input validation5

5.6 Conclusion & discussion

In conclusion, this chapter covered the most important parts in the system which is the implementation, testing and used hardware and software. in addition, due to the some functions that postponed because of the time to be the future work, there aren't any results yet.

CHAPTER 6

CONCLUSION AND FUTUURE WORK

CONCLUSION:

In conclusion, we address the need for advertisements that has recently increased due to the availability of the goods and competition from companies. Since marketing has become dramatically linked to technology, the concepts of our application is to link ads with entertainment to seem attractive. In addition, offering and advertisements with an affordable price to solve the high advertisements cost by influencers. We also made sure that the advertisements reach participants according to the actual location of the store and the participant. We learned a lot during journey on this project new programming languages flutter, dart, and web server firebase and learned new research methods to solve problems , We learned to think outside the box and how is it important continuous collaboration with each other ,We have used what we have been learned in studied years

FUTUURE WORK:

- Specific page for the development
- Participants can collect points
- The System will automatically send the winners from the winners table to advertisers to let them choose.
- Participants can scan the barcode to get the discount
- Advertisers can set a barcode for the discount instead of code
- Team challenge will be available instead of only individuals
- Diversity in the question type
- Top ten restaurants
- Customize packages
- Cover much more areas

Lessons learned from project:

during this journey all team members had several knowledges add to their owns such as:

1-new programming language called flutter

2-dealing with non-sql database like firebase.

3-making a Scientific poster

4-how to use the time well

5- being multitask persons

7- the most important things we learned is that as much as the team together is what make these difficulties are possible to resolve and this project worth.

APPENDICES

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