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ONLINE BEST OFFER (OBO)

Proposed System

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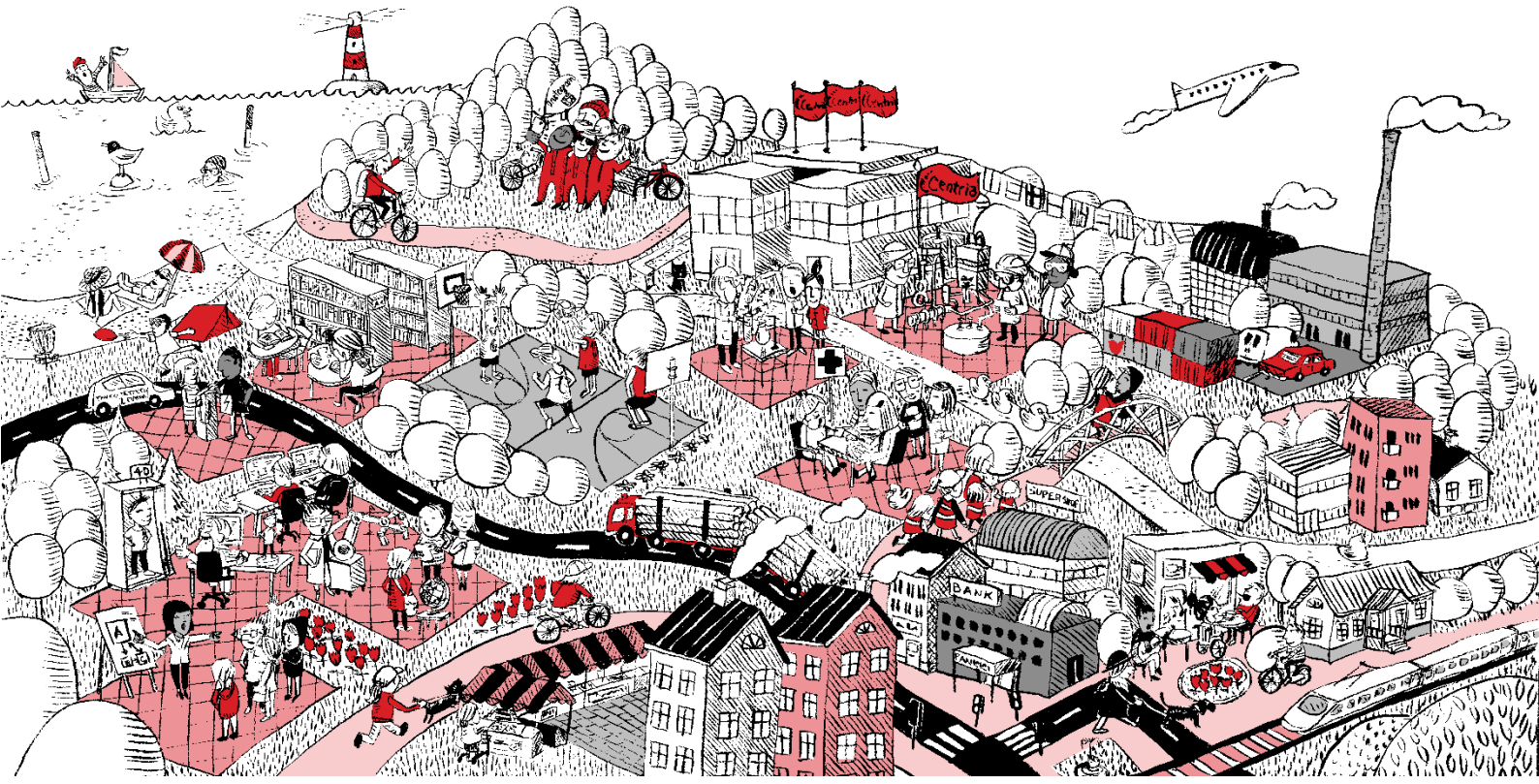

ABSTRACT

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The aim of the thesis is to show how a web application for online marketing (ecommerce) should work and function. This thesis describes a detail procedure to build a web application that allows the members to publish their offers to the customer online.

This thesis describes the detail of all necessary step to build a simple web application for online seller and buyer. Reader of this thesis can easily understand the concept behind this web application. This is only the theoretical assumption of web application, where reader can find all information like system design, domain design, architectural Style, design method includes ER diagram, activity diagram, sequence diagram and class diagram. If a reader can follow the thesis step by step, he/she can easily understand the logic behind the simple web application.

This thesis mainly focuses on solving the problems in our society which saves time for customers to search about good offers, to find the place that contains offer by using google maps and helps the customer to make comparisons between the offer's prices. Apart from development of web application this thesis is a theoretical representation of how the application should function. Use case diagrams for admin, company and users are properly described in this thesis.

In today's era, it can be seen the technology is growing to places. This functioning of a web application enables the users and companies to elaborate in the market i.e., to grow in a market in a much easier and convenient way. As a result, this proposed system can be more useful in the developing countries like Nepal, where the business of online marketing is growing in a hasty way.

Key words
ER Diagram, use case Diagram, activity diagram, sequence diagram, class diagram

CONCEPT DEFINITIONS

List of Abbreviations

OBO	**Online Best Offer**
ROM	**Read Only Memory**
RAM	**Random Access Memory**
GB	**Gigabyte**
XP	**eXPerience**
UI	**User Interface**
UML	**Unified Modeling Language**
APP	**Application**
PDF	**Portable document format**
ER	**Entity Relationship**
DFD	**Data Flow Diagram**
0 level DFD	**Zero Level Data Flow Diagram**
1 level DFD	**One Level Data Flow Diagram**
2 level DFD	**Two Level Data Flow Diagram**

ABSTRACT
CONCEPT DEFINITIONS

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1 INTRODUCTION

In this modern-age technology has become the habit and lifestyle of human. Without technology, daily life becomes more difficult and time consuming. Especially, in the field of marketing, entertainment, sports, games. Various opportunities are being provided by modern day technology, which helps people in everyday life. Nepal, a small developing country which lacks in taking some advantages that technology can offer, for examples shopping malls are still using paper-based advertisement to promote their offers. Some of the web applications are currently served their service in Nepal. But those are not sufficient for Nepali markets.

Online Best Offers is a web application that allows the members to publish their offers to the customers online. The proposed system will enable customers to find the best offers from different companies at one place and compare between offers. The customer can compare and choose the best product in short time while saving money. This online best offer service helps the companies to boost their marketing and can be beneficial for both seller companies and customers.

In this thesis, solutions for general problems encounter in the existing ecommerce apps and websites in Nepal which are low-speed internet, easy access to the system and system crash are prescribed by the researcher. To solve the problems that presented above we need to develop web application that will operate on three modes as low-quality mode, medium quality mode, and high-quality mode. In low-quality mode it will consume less data, similarly in medium mode it will operate at normal mode which will consume moderate data and finally the high-quality mode which will fully show all feathers as well as best quality images available. In all the above mode user can switch to a button as well as sort the goods according to the price and others metric too.

It will provide comparison feature, using which the customers can compare between the similar goods. Also, system will prompt similar goods according to user search. Keeping the systems updated and verifying each product category before lunching them on the system. Which can reduce the system crash related errors. Above presented solutions helps using low-quality mode most of the high data consuming feathers will be disabled and images will be loaded in low quality which will reduce data consumption and site loading time enhancing the response.

Similarly, in medium quality mode most of the features will be enabled and images will be loaded in normal size consuming moderate data. This will enable all required functions along with satisfactory image quality which will be much useful in suburban areas as well as in rural area with high demand. Above solution not only reduces data consumption and improve site loading time enabling high reach to people of rural areas but also improves site server service as load will be low on server. As the load will be less on server hosting cost will go downward and reliability also increases. Also, for high quality mode it will provide best available image quality as well as high source demands services. This will give the user the experience they required.

Using comparison features the customers can easily compare price and quality of required product from various venders and can choose the most suitable option for them which will increase customers satisfaction and reduce fraud. By keeping the systems updated after each sell and ensuring the availability of each item and verifying each product category on the system can reduce the crash related issues in the system and will give the customers genuine information about the items in the system which can be time saving as well.

2 HISTORY OF ECOMMERCE

Ecommerce generally means selling or buying of goods, data, and other tools through internet. We are living in this advanced electrical and technological world, but we need to know about the history of e commerce. We are in the advanced world with the power of internet. Ecommerce is also one of technologies which offer various advantage for this fast-growing world. Ecommerce was introduced about 40 years ago, since then it helps countless growth in business. (McFerrin n.d.)

2.1 History of world's ecommerce (online shopping)

Ecommerce was originated by an English invertor called Michael Aldrich in 1979. He connected television with telephone line and perform real time chat with customers or with seller. Aldrich was stressed with his time spending in shopping, so he introduces a new system called "Teleshopping". Later in 1982, scientist launched the first ecommerce company called Boston computer exchange. The primary aim of Boston computer exchange was an online market for those who want to sell their used computers. At that time, meaning of online was to connection with any network or with external devices, in that period computers are connected with telephone line and Boston computer exchange can connected online via television, later on they introduced BoCoEx. (Middleton 2021.)

Ecommerce began to grow in late 90's but it was still struggling. Tim Berners- lee and Robert Cailliau decided to build a hypertext browser called "World wide web. During same year in 1990 they designed the first web server. In august 1991 they again create history and made first ever website, making the www as a publicly available service. (Big Commerce 2019.)

SSL (secure socket layers) was introduced in 1994 by Netcsape which is an encryption-based internet security protocol, for the further development of the ecommerce SSL played one of the vital roles. It helps to secure data and information during transaction or during online shopping. In 1995 Amazon lunch by Jeff Bezos. Amazon was initially an online bookstore but now Amazon offers virtually everything. In the same years eBay also introduced. Initially eBay was called Auction web. The presence of Amazon and eBay helped in the development of the ecommerce in the world, but lack of reliable payment gateway was still a big challenge. (Miva 2011.)

In 1998 PayPal was introduced and hit the marketplace and quickly becomes a success. Introduces of PayPal set the market for others business. Similarly, Chinese businessman Jack Ma lunched Chinese marketplace Alibaba.com in 1999, which is now one of the well-established marketplaces in world. Due to increment in the ecommerce google decided to lunch Adwords in 2000, an advertising service which allows seller to place their items for advertising. (DONSZEM 2020.)

The next big step in ecommerce was Shopify. which was established in in 2004. It was wise idea to change the concept of online shopping. Shopify is introduced for low capital seller, where they can setup their online store. By the development of Shopify all low capital seller also can sell their item online, which really help in the development of the ecommerce in the present world. In 2006, due to heavy public demand PayPal introduced new payment system, where they can exchange their money and buy thing, they want directly from their cell phones. (DONSZEM 2020.)

Following is the main transaction history of world ecommerce by its date. It is almost about 50yeras ago ecommerce originated in the world. Here are few important date and milestone throughout the ecommerce history. The first ecommerce company CompuServe was founded in 1969 and first ever electronic shopping was introduced in 1979 by Michael Aldrich. similarly, first ecommerce platform was launched by Boston computer in 1982. likewise, first web server and www were launched in 1990. After that Charles M stack lunched first ever online marketplace, Netscape launched secure socket layers in 1994. Widely known amazon and eBay were lunched in 1994 and 1995, respectively. After PayPal was introduced in 1998, Chinese businessman Jack Ma lunches Alibaba.com in 1999. In 2000 google lunches AdWords, in 2005 Amazon introduced flat fee, in 2006 PayPal introduced new payment method from cell phones. and the most convenient and reachable social site Facebook enter the ecommerce in 2011 and in same year stripe start online payments. In 2014 apple introduced apple pay and in 2015 google also introduced android pay. finally, another social site Instagram also enter ecommerce in 2017. coming to the year 2019 ecommerce sales reached $3.5 trillion. During this pandemic ecommerce is really growing fast and people know how important online shopping is. (McFerrin n.d.)

2.2 History of ecommerce in Nepal

Nepal is still developing countries in south Asia, residing in between superpower countries like China and India. But the takeover of E-commerce in Nepal is still poor. The purpose of E-commerce was

introduced in Nepal in 2000 by Muncha house, to send gift from abroad to their loved ones. Muncha-house.com was started by the departmental store muncha house which is the official first online shopping site in the history of Nepal. But Balkrishna Joshi, co-founder of thamel.com claims that his company is the first ever e commerce company in Nepal and claims that it was stablished in 1998. During that period thamel.com aim was to be globalizing and digitizing the business of the shops located in Thamel (One of the biggest Tourist Street in Kathmandu). (Glocal Khabar n.d.)

Later, some online stores wore seen but those were just virtual stores having no product as well as lacking management of customer service. No proper process of buying and selling online was to be seen. The purpose of virtual stores in Nepal was just to bring the awareness of E-Commerce among the mass of people. This way the E-Commerce came into existence in Nepal. The growth of e-commerce was decreased due to civil war period of Nepal history. (Budhathoki 2020.)

There are some figures, which describe the present situation of online users and ecommerce in Nepal. According to the report published in 2018, about 63% of Nepalese have access to the internet which is 52% more in comparison to 2011. Most of internet users in Nepal access via mobile phone, according to report by NTA's MIS in 2018, 95% of Nepalese have access internet via mobile phones. Total 50 internet service providers are officially register in Nepal and more than 40 thousand commercial websites are registered in Nepal. (Source: NTA's MIS, export.gov) (Bhatta 2018.)

The above data clearly shows the opportunities and reason to develop online business in Nepal. In 2009 the first payment gateway was introduced called E-sewa. Later, Nepal Rastra Bank issue licensed and approved payment service provider within Nepal. Since then, some other payment gateway established like iPay, IMEPay, Khalti, e-Khlti, epay etc. all these providers contributed to the growth of online shopping and ecommerce in Nepal. In Nepal most of the online shopping site are based on either in Capital city (Kathmandu) or few big cities. Because of the advanced internet access with large number of internet users, smooth delivery service, high demand of the customers, busy lifestyle, large number of online stores and advanced payment gateways available in those cities. There are some online business sites currenting working good business in Nepal. Which are Hamrobazar, Daraz, Foodmandu, Muncha, Sastodeal, NepBay.com. These are the most well-known ecommerce web application with the online payment system. (Vaidya 2019.)

3 SYSTEM REQUIREMENTS

System requirements state and identify the functionality needed by the system to satisfy the customer's requirements. This show what is requirements and how will that requirement to be fulfilled. System requirement is the required features to create an application including both hardware and software. After studying and analysing application functioning, problems, responses, and customers' satisfaction of existing web application widely used in Nepal, following fundamental system requirement have been identified. which are mentioned below and describe later. They are software and hardware requirements, functional requirements, and non-functional requirements. (Siedle n.d.)

3.1 Existing e-commerce site

The existing application like sastodeal.com, daraz and hamrobazar provides offers and marketing for companies. These applications are widely use in Nepal. As we studied these applications very well and in detailed form, we found both advantages and disadvantages in the systems. These systems are advantageous for both companies and customers, but all above applications have some problems, that purposed system tries to avoid. Those problem are slow response to the search, take time to response, system is bulky and more problematic, no reliability in the offers. Show multiple prices for same quality, complicated to use. (Sapkota & Khanal 2021.)

When customers try to search specific item in the system, system takes times to response and sometimes system shows error message. System is slow while showing its category and more time consuming. This system requires good internet speed to response quickly. Most of the time system response only error message while searching for different items. While searching for different items prices, system continuously shows the same price for multiple items. System was completed to use for customers. Specially if you used your cell phone for application, system often crash and restarted. (Sapkota & Khanal 2021.)

3.2 Proposed System

The proposed system will eradicate all the problem issues we found in the existing system. There will be proper functionality to search. The offers will be categorized using price, place and type. The user interface will be designed to be the simplest so that there are no complications for the user to access it. Similarly, communication support will be given to both the customer as well as the company. (Greever 2015.)

3.3 Hardware and software Requirements

OBO is the application specially for country like Nepal. so, it inspired from exiting web application in Nepal like sastodeal, daraz, hamrobazar etc. before writing this thesis we researched a lot on these web applications, as a result the system needs following hardware and software requirements. In this system, we are using software only, as we mentioned, OBO project is a simple web application, and the sources are limited and less in number. (Sapkota & Khanal 2021.)

According to our studies in sastodeal, daraz, hamrobazar applications, we came to know about estimated software requirement: Software requirement included Windows XP, WAMP or XAMP server and any browser but prefer google chrome.

3.4 Functional Requirements

Functional requirements are the requirements which specifies the functions what the system should do. In other word it describes the behaviour of the system when certain condition is met. Figure below describe the functional requirement of the system. (Eriksson 2012.)

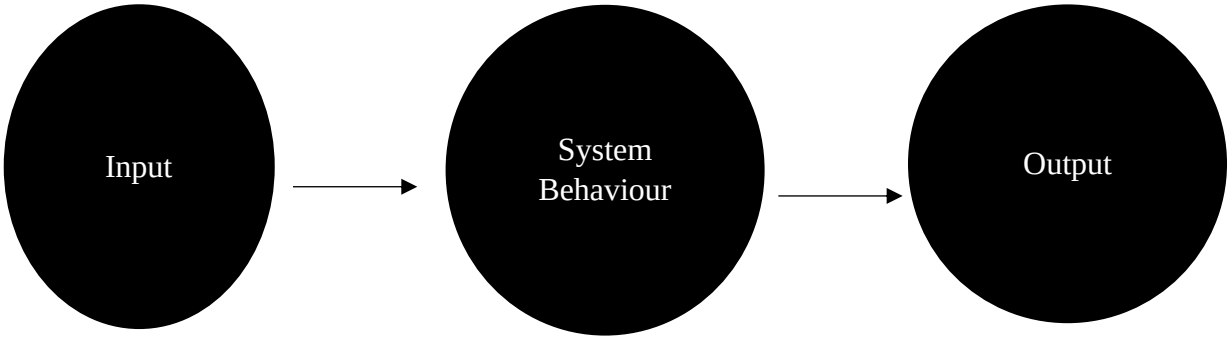

FIGURE 1. description of functional requirements *(QRA n.d.)*

Functional requirement of the system is defined as the functional and operational requirement of the system, or each type of user mentioned in the system. There are many requirements related to functional and operational requirements, but the system should at least implement some functional requirements. The system should allow the customer to register and create account, to search offers in the system, to browse different categories using the system and write comments about offers. For the company, the system should allow to register and create account, manage offer information (title, description, valid dates, and image) and allow for changes and to view, reply comments and reviews their offers using the system. For the administration, the system should allow the administrator to approve company registration before using the system, delete accounts in the system and delete offers in the system. (Eriksson 2012.)

3.5 Non-Functional Requirements

Non-functional requirements are requirements that specifies criteria that can be used to judge the operation of a system, rather than specific behaviours. The non-functional requirements are listed below. (AltexSoft 2019.)

TABLE 1. Types of non-functional requirements (Paradkar May 2017.)

Types of non-functional requirements	**Description**
Availability Requirements	The system's information should be available most of the time to user registered in the system.
Security Requirements	The system access control should give access to only authorized users.
Reliability Requirements	The system should provide users correct and trusted information and the system should be able to re-cover in case of system failure and the database should be kept safe during failure.
Maintainability Requirements	Describe the needed time for a solution or its component to be fixed or changed to increase performance to a changing environment.
Localization Requirements	Defines how good a system, or its element in the context of the local market.
Performance Requirements	The system responds in a timely manner and should load and save data to the database in short time. It determines how well the system performs certain function under specific condition.
Scalability Requirements	The system will meet the performance requirements under the highest workload.
Portability Requirements	Defines how a system or its element can be launched on one environment or another.
Compatibility Requirements	Defines how a system can co-exist with another system in the same environment.

3.6 Usability Requirements:

The system should have a user-friendly interface, clear and meaningful title as well as contrast colours. In usability requirements, the system must be suitable for all users and easy to use, in which the users can use the system without any training. Here is some example of usability requirements they are Learnability, Efficiency, Memorability, Errors and Satisfaction. learnability evaluate how fast is it for users to complete the main actions once they see the interface? Efficiency evaluate How quickly users can reach their goals? Memorability evaluate Can users return to the interface after some time and start efficiently working with it right away? Errors evaluate How often do users make mistakes? and Satisfaction evaluate Is the design pleasant to use? (AltexSoft 2019.)

4 ARCHITECTURAL REPRESENTATION OF SYSTEM

System architecture is the abstract model that defines the structure, behaviour, and more viewpoints of a system. Software design document is to providing insight into the structure and design of each component. In short, this data is meant to equip the reader with an understanding of the inner work of the OBO system. This includes methodology, system architecture. (Han et al 1999.)

4.1 Design Decisions

Software design is a very difficult and important phase in software architect of any application where design decision is an iterative process. This process includes the four different phases, they are requirements discussions, requirements specification, software architect and implementation and testing. Architects describe the bare bones of the system by making high-level design decisions. Errors made in the process of the architecture always have a strong impact in the results. (Jansen & van der Ven, 2008)

4.2 Domain Model

The domain model is an organized and structured knowledge of the problem. The Domain Model should represent the vocabulary and key concepts of the problem domain and it should identify the relationships among all the entities within the scope of the domain. In other word domain model is a structured visual representation of interconnected concepts or real-world objects that incorporates vocabulary, key concepts, behaviour, and relationships of all its entities. The domain model is designed to show the reality of conceptual classes, not of software components. It is used as a reference to diving guidance for designing software objects. The domain model for OBO is presented in figure 2 below in domain model diagram of online best offer. (Chursin 2017)

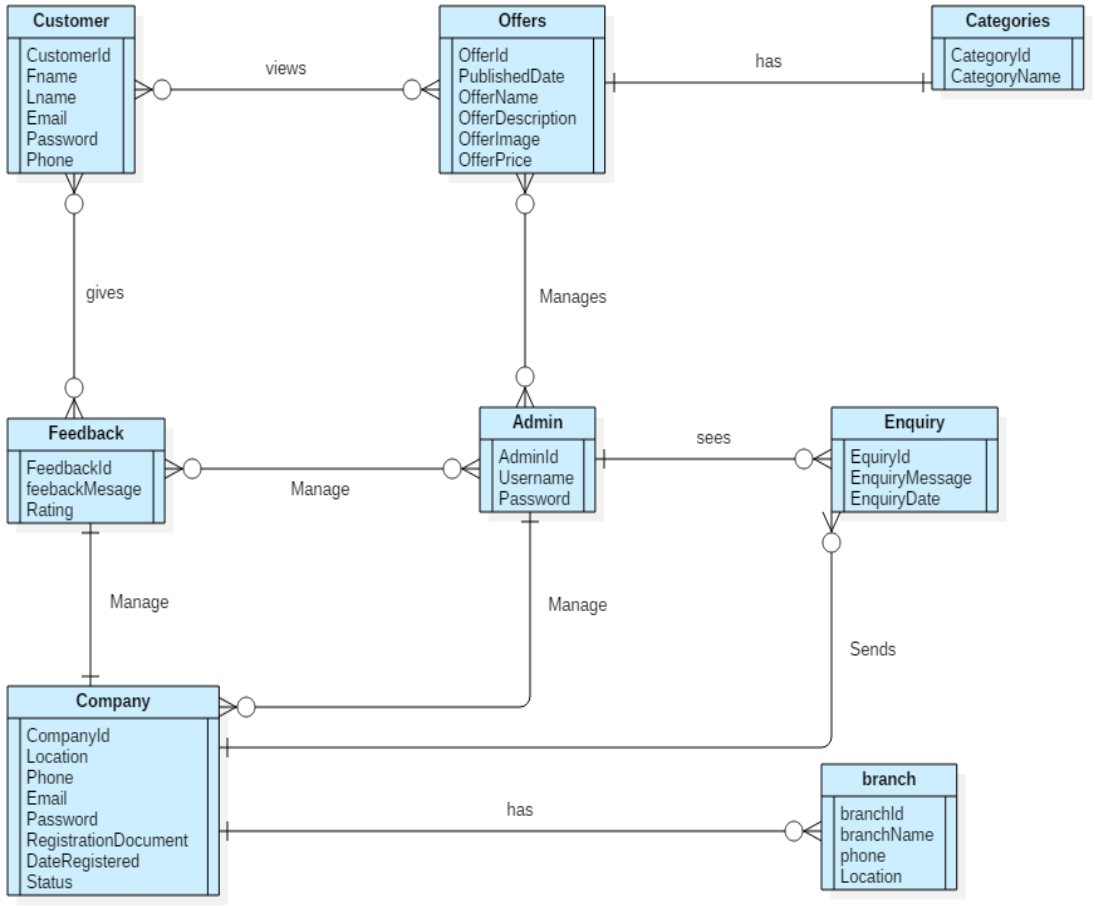

FIGURE 2. Domain Model Diagram of OBO. (Chursin 2017.)

4.3 Architectural Style

Since an architecture embodies both functional and non-functional properties, it can be difficult to directly compare architectures for different types of systems, or for even the same type of system set in different environments. Styles are a mechanism for categorizing architectures and for defining their common characteristics (Di Nitto & Rosenblum 1999.)

Perry and Wolf (Perry & Wolf 1992.) define architectural style as an abstraction of element types and formal aspects from various specific architectures, perhaps concentrating on only certain aspects of an architecture. An architectural style ensures the decisions about the elements of architectural and emphasizes elements to the constraints important and their relationships. This definition is given up to styles that attention only on specific sides of the component interfaces or on the architecture connectivity.

OBO uses Client-Server architecture style. This is very widely used style which defines a system structure comprised of two types of elements; a server that provides one or more services via a well-defined interface and a client that uses the services as part of its operation. The client and server are typically assumed to reside on different machines in a network (although this is not a requirement of the style, the client and server could be in the same operating system process). (Jansen & van der Ven 2008.)

The OBO system is broken up into two major components: a client-side and a server-side. The client-side is also separated into two parts: the functional component, and the graphical component. The functional component forms the core of OBO. It receives user input and performs all the tasks that user required. The graphical component, as the name implies, is simply the graphical user interface. It provides all the buttons, text boxes, and other elements which allow the user to access all the features provided by the system. The server component of OBO is the database which provides centralized storage for synchronized data. (STRINGFELLOW 2017.)

The architecture of OBO is defined in figure 3 below in architectural style of OBO. The upper layer is UI Layer; this layer represents the user interfaces through which the user interacts with the application as the clients using the browser. The second layer is Application Layer; this layer represents the controller classes of the application. The third layer is Data Model Layer server-side; this layer represents the entity classes of the application and data stores. (Sherman 2015.)

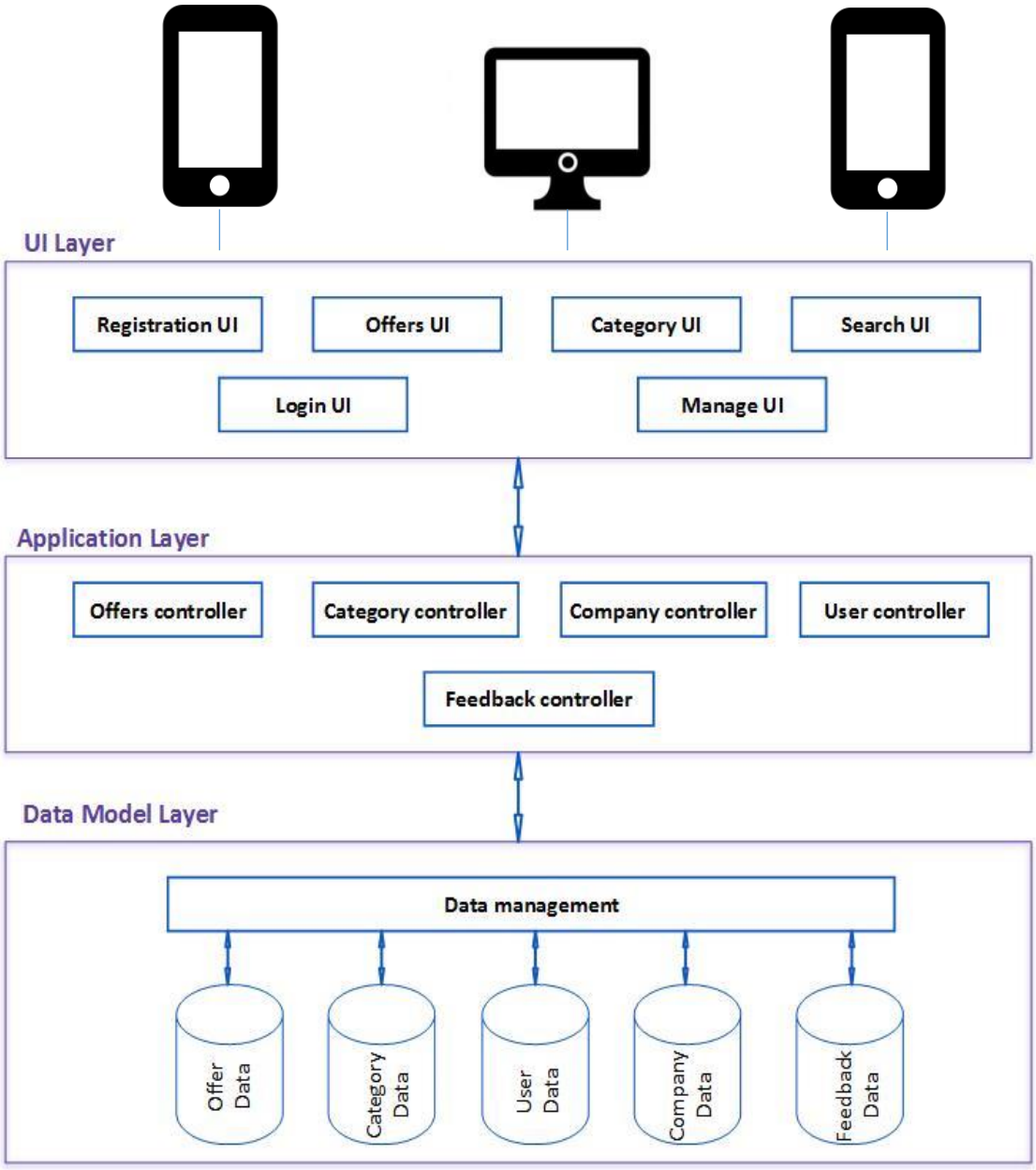

FIGURE 3. Architectural style of OBO. (Wilson 2020.)

4.4 Structural Model

Structural models of software display the organization of a system in terms of the components and their relationships. Structural models may be static models, which show the structure of the system design, or dynamic models, which show the organization of the system when it is executing. In this system, it has three different actors. They are administration, company, and users. And each function of the actors is described in the use case description tables and their figure are available for picturing the working mechanism of the whole system. (Dooley 2017.)

4.5 Use Cases Diagram

Use case are modelled using unified modelling language UML. It defines interrelation and interaction between external actors (Source) and the system to achieve desired goals. Use case in made up of four different elements. They are boundary, actors, use cases and relationship. The figure 4 below shows the elements of use case diagram. (Imam 2019.)

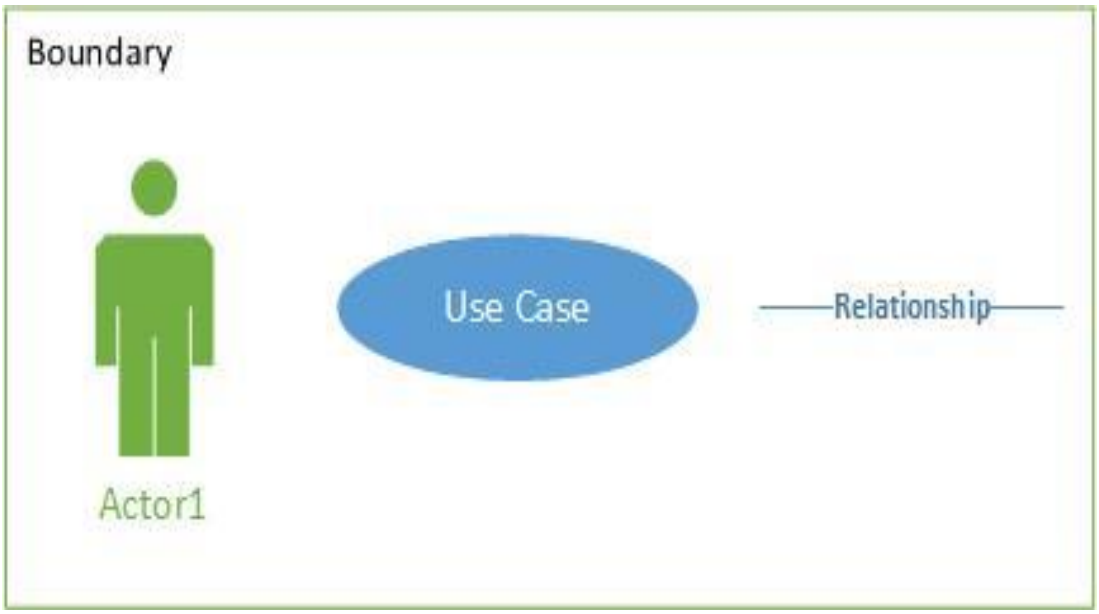

FIGURE 4. Use Case Diagram (Pilone & Pitman 2005.)

4.5.1 Administrator Use Case Diagram

Figure 5 below show the use case diagram of administrator, and it also describes the relationship between admin and their processes. Administrator is the main part in the system, which controls the working of the system. In figure 5 below, we describe all the function regarding administration parts, like login, offers sections (publish offer or delete offers), managing company and users. figure 5 below describe the administration use case of the system.

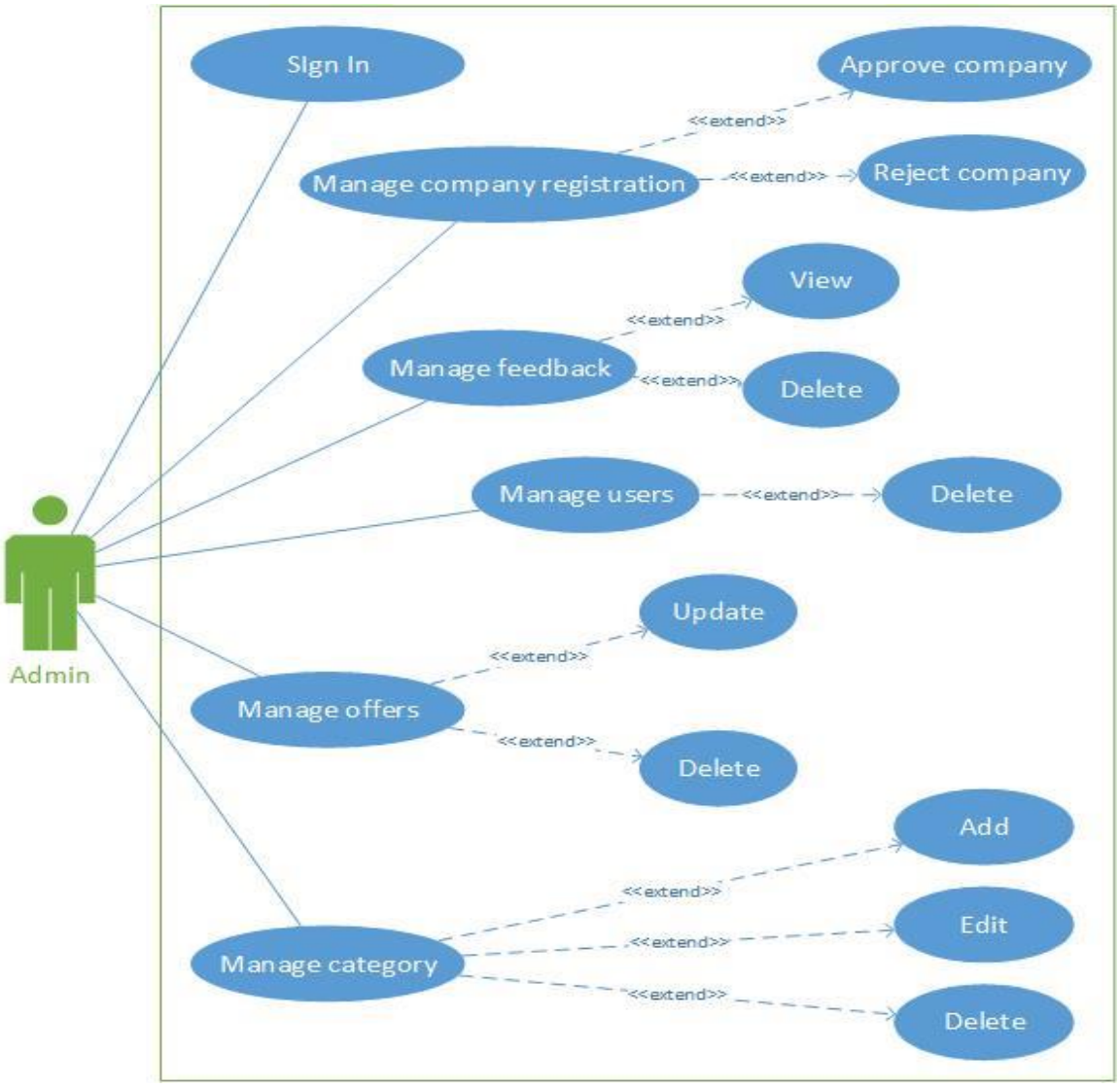

FIGURE 5. Administrators use case diagram of OBO. (Freeman 2020.)

In administrator use case diagram, there are several functions. They are sign in, manage user of company, manage user feedback, manage user, update offer, delete offer, add new category, delete category and edit category. These are well described below in the section under administrator use case diagram.

Sing In is the first step for admin to entre in the system obo. The table below describes the sign in mechanism in the system belongs to administrator use case diagram. Where administration is a primary actor. And main goal is to login into control panel of the system. Open application asked you to login into site, once you put all login information then system automatically led you to the control panel. (Freeman 2020.)

TABLE 2. Sign In description in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Login to control Panel
Stakeholder	Admin
Pre-condition	Open the web site or android app. Click on admin login link. Admin login page opened
Post-Condition	Successful login
Success Guarantee	Correct login username and password
Priority	High
Secondary Actor	Web site or Android Application
Main success Scenario	Admin enters his/her username and password; the website checks the database and if correct the administrator access into control panel.

Manage users of company, where admin can approve or reject any user before registration process. The table 3 below describes how admin approves and rejects company's registration in the system. Approves or rejection of any company register is controlled by admin. After successful login into the system, admin can choose registration option, the system shows all new registration, admin can manage any new registration here. Admin can reject, accept, or suspend any company registration. (Sartdraw n.d.)

TABLE 3. Manage users of company description in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Approve or reject company registration on the system
Stakeholder	Admin
Pre-Condition	Open the web site or android App. Login successfully Choose Approve/reject registration option.
Post-Condition	Successful approving or rejection of the new company to the database
Success Guarantee	-Unique and new company data -PDF file must be attached to identification documents to verify the company's credibility.
Priority	High
Secondary Actor	Web site or Android Application
Main Success Scenario	Admin after successful login, choose new registration option, the system will display all new registration of company, if company information is acceptable and meet the conditions then click approved.

In administrator use case descriptions, manage users' feedback is another important function. Where admin can manage feedback from company or user. In the table 4 below describe how an admin manages feedback from users and delete the feedback in the system. The main goal of the system is to view and delete the feedback by admin. It helps admin to manage system as per as clients wants.
When admin successfully login inside the system, then choose feedback option. In feedback option admin can read and check all feedbacks, if admin want to delete feedback from system, system asked admin for deletion process, once admin conform the process, system automatically delete marked feedback from the system. (Freeman 2020.)

TABLE 4. Manage Users feedback Descriptions in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	-View feedback -Delete feedback
Stakeholder	Admin
Pre-Conditions	Open the web site or android App. Login successfully Choose view feedback options. List of feedbacks about offers
Post-Conditions	Successful deletion existing inappropriate feedback from the database.
Success Guarantee	Find the inappropriate feedback to be deleted
Priority	Medium
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose view feedback option to delete, the system confirms the deletion process by the admin and the admin confirm the deletion, the deletion successfully completed.

Admin can also manage any users in the system. Table 5 describe How admin manage users in the system. Where administration is a primary actor. Main goal of the use case is to remove those unwanted users from the system. Admin can delete any user from the system at any time. Admin can remove any users from the system, after successful login, an administrator can erase any user detail from the system database. After successful login into the system, admin can choose user account option. Then admin can search target username for delete. The system conforms the user account and admin can proceed for the deletion process. Once admin conform the process, system automatically delete all the unwanted user detail from the system. (Freeman 2020.)

TABLE 5. Manage user Descriptions in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Delete existing user from the system.
Stakeholder	Admin
Pre-Conditions	Open the web site or android app. Login successfully Choose Delete account option
Post-Conditions	Successful deletion existing account from the database
Success Guarantee	Find the account name to be deleted
Priority	Medium
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose user account option, search for account name to be deleted, the system confirms the deletion process by the admin and the admin confirms the deletion, the deletion successfully completed, and the user is no longer allowed to enter to the system.

Administrator can update any existing offer in the system. The whole process of update offer is mentioned below. Table 6 below describes the use case to update offers in OBO system. The main goal of this part was to update existing offers in the system database. After successful login, admin can update any existing offers in the system database. If any certain offers need to update, then admin can search that offer name with correct category in the system database. (Sartdraw n.d.)

TABLE 6. Update offers Descriptions in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Update existing offer to the system
Stakeholder	Admin
Pre-Conditions	Open the web site or android App. Login successfully Choose update offers option
Post-Conditions	Successfully updating existing offer to the database
Success Guarantee	Find the offer name to be update
Priority	Medium
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose update offers options, search for offer name to be update, the system confirms the updating process by the admin, and the admin confirm to update, the updating successfully completed.

Administration can delete any offer from existing category. If any offers in the system need to delete, then following process should be followed by admin of the system. Table 7 below shows how the system works when admin needs to delete offers from the database of the system. The goal of delete purpose is to delete existing offer form database. Admin can enter the system with login and choose those offers for deletion process. Once admin confirm offers for deletion, the system automatically deletes selected offer from the database. (Sartdraw n.d.)

TABLE 7. Delete offers Descriptions in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Delete existing offer from the system.
Stakeholder	Admin
Pre-Conditions	Open the web site or android app. Login successfully Choose delete offers option.
Post-Conditions	Successfully deletion existing offer from the database
Success Guarantee	Find the offer name to be deleted.
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose offers options, search for offer name to be deleted, the system confirms the deletion process by the admin, and the admin confirm to delete, the deletion successfully completed.

Add category is the process to add new category of item in the system. Table 8 below describe how to add category in the system. Administration is a primary actor as well for the system. This process main goal is to add new category in the system. When admin login into the system, can choose category option, where admin can choose to add new category option. System asked for the require information from admin, once admin fill all information into the system and conform the process, system automatically check all information and update(add) new category in the application. (Freeman 2020.)

TABLE 8. Add Category Descriptions in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Add new category to the system
Stakeholder	Admin
Pre-Conditions	Open the web site or android app. Login successfully Choose Add category option
Post-Conditions	Successfully addition of new category into the database
Success Guarantee	Verification of entered data, enter correct category name, unique and new category name
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose category option, choose to add new, enter all required information in the correct way, the system verifies the entered data, and acceptable and meet the conditions, the addition process is successfully completed.

Delete category is another function in administrator use case. When existing category is expired or need to delete from the system, then following process must done by admin. Table 9 below describe the process of delete category. Administration is the primary actor and admin is stakeholder. The aim of the process is to delete existing category from the system. When admin enter inside the system after successful login, choose category option and search for existing category to be delete. System asked for the deletion process. When admin confirm the process, the system starts to delete selected category from the category list. Once the process complete, system verify the category is no more available in the category list, the system generates automatic message "deletion process is successfully done". (Oracle 2007.)

TABLE 9. Delete Category Description in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Delete existing category from the system
Stakeholder	Admin
Pre-Conditions	Open the web site or android app. Login successfully Choose delete category option. Category must be empty, with no items under it
Post-Conditions	Successfully deletion existing category from the database
Success Guarantee	Find the category name to be deleted
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose category option, choose to delete, search for category name to be deleted, the system confirms the deletion process by the admin, and the admin confirm delete, the system verifies that the category is empty, the deletion successfully completed and the category no longer available on the website.

Edit category is the part of administrator use case diagram. Admin can choose any certain category from database and can edit its name in the system. In the table 10 below shows how the system work, when admin need to edit category list. Administration is the primary actor, and the admin is stakeholder. The main goal of the process is to edit existing category in the system. After successfully login in the system admin choose the category option, and then choose the edit option, system will show all the category inside database. Then Admin can choose the desired category for edit. (Freeman 2020.)

TABLE 10. Edit Category Descriptions in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Search for certain category in the system, to display all its items, and edit its name
Stakeholder	Admin
Pre-Conditions	Open the web site or android app. Login successfully Choose edit category option
Post-Conditions	Successfully find the category and allow editing of the category name in the database
Success Guarantee	Find the category name in the database, and the new name is not available before in the database
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Admin after successful login, choose category option, choose to edit, search for category name to be edit, the system makes the search process and display the result for the admin, and admin will see the category name with all the items under it, and will be allowed to edit the name and save it.

4.5.2 Users Use Case Diagram

Figure 6 below show the use case diagram for the relationship between user and their processes. This shows how user can control the system. Below describes all necessary processes for user to use this system like registration, sign in, search for offer and other activities. In user use case diagram, there are several functions. They are registration, sign in, request new password, navigate through categories and offer, filter search about offer by price, filter search about offer by location, filter search about offer by rating, send feedback, delete feedback and edit feedback. These are well described below in the section under user use case diagram.

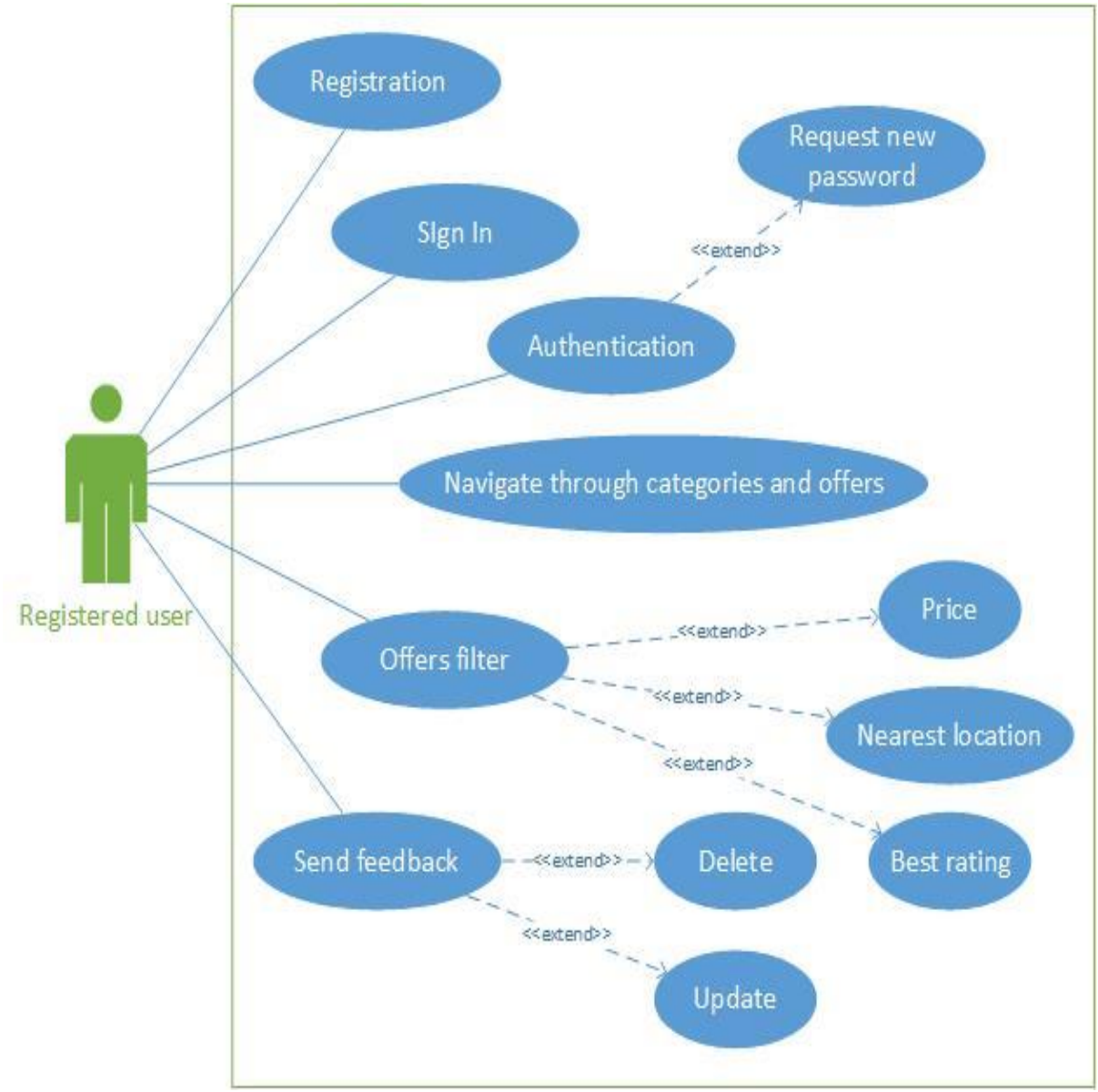

FIGURE 6. Users Use Case in OBO. (Freeman 2020.)

Registration is the process for user to register an account in the system. Table 11 below show the registration process of the user in the system. The aim of the process is to create an account in the system. Users enter all necessary information in the system in correct way, the system verified all information, if the information is valid and correct, the system automatically create an account. (Fergusson 2018.)

TABLE 11. Registration Description in OBO. (Oracle 2007.)

Primary Actor	Administrator
Goal	Create an account in the system
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on Customer sign up link. User registration page opened
Post-Conditions	Successful creation of new account into the database
Success Guarantee	Verification of entered data, enter correct unique and new username
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Enter all required information in the correct way, the system verifies the entered data, and if acceptable and meet the conditions, the creation of a new account was successfully completed.

Sign In, after successful registration into the system user will create login id and password. After successful login user can enter the system. Table Below 12 shows how user can login into the system. The primary actor is registered user and stockholder is user. The aim of the process is login into the system. When user enter username and password in the login page, the system checks its database, if the enter information (username and password) is correct then system automatically gives access to the page for users. (Fergusson 2018.)

TABLE 12. Sign in Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Login to use the system
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on Customer login link. User login page opened
Post-Conditions	Successful login
Success Guarantee	Correct login username and password
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Users enter username and password, the system checks the database, and the user access to the main layout.

Request new password, when user forget system login password or id then user can reset or request new password in the system (login portal). In table 13 below shows how the user can order the new password. When users entre inside the website, in login page user can find the forget password option(link), system asked for email address for verification in its database, if the enter email address is stored in the system database, then system send automatically send link for reset password in users' email. Once user receive email from system then users can reset the new password. (Dragon1 2021.)

TABLE 13. Request New Password Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Get a New Password
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on forget password. Forget password page opened
Post-Conditions	Successful change password
Success Guarantee	Enter the email address.
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	User Click on ¨forgot password link¨ and enter email address, the system checks the database, and if the email address exists in the database the application will send user information to user email.

In user use Case descriptions, navigate through categories and offers means to search a certain item in the category list. In the table 14 below describe the how user can display all information inside any category. After the user login into the system, then the user chooses a category. Once click on category option, the system explores all category form database. User can choose any category from system and check all offer necessary offers and information of desired category. (Dragon1 2021.)

TABLE 14. Navigate through categories and offers description in OBO. (Oracle 2007.)

Primary Actor	Registered User/ visitors
Goal	Enter certain category in the system, to display all its items
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on category list
Post-Conditions	Successful find the category and display all its items
Success Guarantee	Find the category name in the database, and finds items under it
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Users choose one types of categories, the page will display all available offers, and once user select certain offers, the page will display all details about the offer.

Filter Search About offers by Price means the user can search any categories in the system by its price. In the table 15 below describes how users can filter offer in term of price. Registered user is the primary actor in this system. The main aim of the process is to find the price of offers available in the category. When user's successful login into the system, click on search link, fill the information, or item names, then system will generate the search result. Once system generate search result, users can click offer by "filter by price". The system displays all offers from lower to high price range. (Sartdraw n.d.)

TABLE 14. Search by price Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Search for certain offer in the system, to display all offers by its price from the lowest price to the highest.
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on search link. Write what user want to find. Check on filter by price option
Post-Conditions	Successful filtering the offers by price
Success Guarantee	Checkbox ¨filter by price¨
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Users choose search link and type what user want to find, the user will check the ¨filter by price¨ checkbox, the system will display offers after rearranging by its price.

In this system user can filter search about offer by its location. After successful login into the system user can search for any offer and then choose for suitable location. In the table 16 below shows how users can check offer by its location. The aim of the process is finding the offer in the desired location. When user's login into the system then clicks search link. Choose "filter by location" option. The system automatically displays nearest location for the search items. (Freeman 2020.)

TABLE 15. Search by location Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Search for certain offer in the system, to display all offers by its location from the nearest to the furthest.
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on search link. Write what user ant to find. Check on filter by location option
Post-Conditions	Successful filtering the offers by location
Success Guarantee	Checkbox ¨filter by location¨
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Users choose search link and type what user want to find, the user will check the ¨filter by location¨ checkbox, the system will display offers after rearranging by its nearest location.

Filter search about offer by rating means any user can find any offer in the system by its rating in the item or category. In the table 17 below describes how users can check offer option filter by rating. Registered user is the primary actor for the process. The aim of the process is finding the offer by its rating from other users. When user's login into the system then clicks search link. Choose "filter by best rating" option. The system automatically displays all offer after rearranging offer by its best rating. (Sartdraw n.d.)

TABLE 16. Search by the best rating description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Search for certain offer in the system, to display all offers by its rating from the highest to the lowest rating.
Stakeholder	User
Pre-Conditions	Open the web site or android app. Click on search link. Write what user ant to find. Check on filter by rating option
Post-Conditions	Successful filtering the offers by best rating
Success Guarantee	Checkbox ¨filter by best rating¨
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Users choose search link and type what user want to find, the user will check the ¨filter by best rating¨ checkbox, the system will display offers after rearranging offers by the best rating.

In user use case diagram, user can send feedback directly into the system for each item or categories. For this process user need to go through certain categories to comments on the offer and services. In the table 18 below describes the process called send feedback. The aim of the system is to send feedback in the system database. When user's login into the system, then user can choose category link, the system displays all offers in the category. User can select any offers and write positive or negative feedback for the offer. (Sartdraw n.d.)

TABLE 17. Send feedback Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Send feedback for offers and service
Stakeholder	User
Pre-Conditions	Open the web site or android app. Login Successfully Choose offers option. Choose send feedback option
Post-Conditions	3
Success Guarantee	Enter the comment in the correct place
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	User Choose categories link, the offers under that category will be displayed, user pick the desired offer and send own comment about offer and service.

The system also allows user to delete the existing comments or feedback in the respective categories. In the table 19 below shows how the system work when user need to delete his feedback from the system. The aim of the process is to delete the written feedback form system by users. When user login into the system, system will display the feedback option, then choose delete feedback option, click the delete feedback link and system asked user for conformation for deletion, once users confirm the deletion, system automatically delete feedback form system. (Dragon1 2021.)

TABLE 18. Delete feedback Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Delete existing feedback from the system
Stakeholder	User
Pre-Conditions	Open the web site or android app. Login Successfully Choose feedback option. Choose to delete
Post-Conditions	Successful deletion existing feedback from the database
Success Guarantee	Find the feedback to be deleted
Priority	Medium
Secondary Actor	Web site or android application
Main Success Scenario	User after successful login, choose delete feedback option, the application confirms the deletion process by the user, and the user confirm to delete, the deletion successfully completed and the comment no longer available in the system.

Edit feedback means user can edit their feedback or comments in the system for any item or category. OBO allows user to edit their comments. Once user successfully login to the system then users can edit their comments in edit comments section. In the table 20 below shows the process for edit feedback for users. (Fergusson 2018.)

TABLE 19. Edit Feedback Description in OBO. (Oracle 2007.)

Primary Actor	Registered User
Goal	Search for feedback in the system
Stakeholder	Android application
Pre-Conditions	Open the web site or android app. Login Successfully Choose feedback option. Choose to edit
Post-Conditions	Successful find the feedback and allow editing of the feedback
Success Guarantee	Find the feedback in the database
Priority	Medium
Secondary Actor	Web site or android application
Main Success Scenario	User after successful login, choose edit feedback option, search for comment user wants, the system makes the search process and display the result for the user, and user will allow to edit the comment and save it.

4.5.3 Company Use Case Diagram

Company is one of the most important Actor in the OBO. The system required registration of company to be entered the system. For registration company should enter required information in the proper ways. System allows company to manage offers (Add new offers or edit offers), view feedback from customers and send inquiry. The figure 7 below shows the use case diagram for the company, and it describes the relationship between company and their processes as well. (creately 2020.)

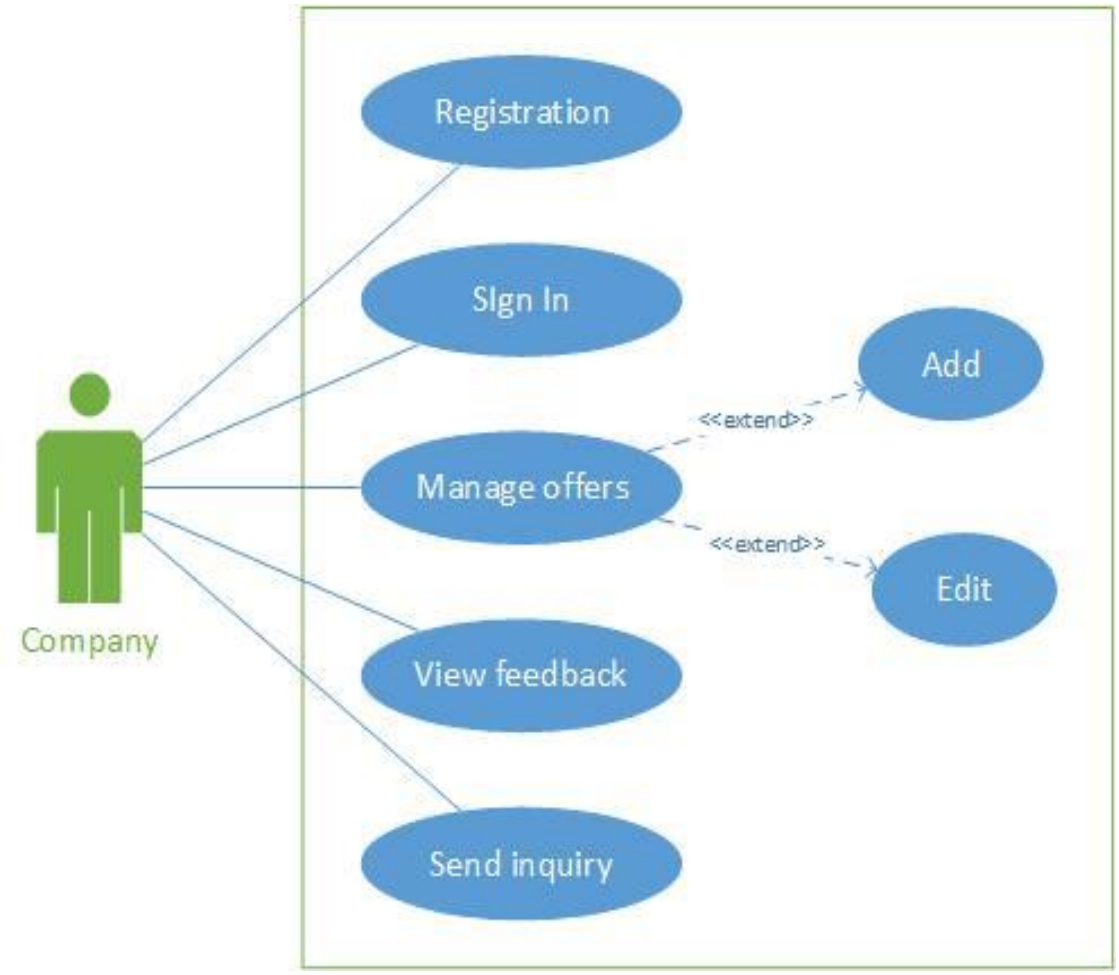

FIGURE 7. Company Use Case Diagram of OBO. (Freeman 2020.)

In company use case diagram, there are several functions which are shows in the figure 7 above. They are registration of company, sign in into the system, manage offers, edit offers, view user feedback and send inquiry in the system. These are well describing below in the section under company use case diagram.

Registration is the process for register into the OBO for any company. If company want to promote their offer in the OBO, they must register first to get log in id and password from the system. OBO has its three different actors, and they are interrelated to each other. Registration is the first step for the company to enter the system. Company must provide required documentation in the proper way. Once the documents are verified by admin, then the system successfully registered the company into its database. In the table 21 below shows how the system work, when company register into the system. (creately 2020.)

TABLE 20. Registration Description in OBO. (Oracle 2007.)

Primary Actor	Company
Goal	Create an account in the system
Stakeholder	Company
Pre-Conditions	Open the web site or android app. Click on company sign up link. Company registration page opened
Post-Conditions	Successful creation of new account into the database
Success Guarantee	Verification of entered data, enter correct unique and new username, waiting for approval from administrator.
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Enter all required information in the correct way, the system verified the entered data, and if the acceptable and meet the conditions, the creation of new account was successfully completed.

Sign in is the one of the functions related to company use case. In the table 22 below describes how the system work when company need to login into the system. The main goal of sign in is to login into the system. In registration, company already create its username and password. If company entered correct username and password, then system checks the database and if it is correct, the company access to the main page of the system. (Fergusson 2018.)

TABLE 21. Sign in Descriptions in OBO for company. (Oracle 2007.)

Primary Actor	Company
Goal	Login to the system
Stakeholder	Company
Pre-Conditions	Open the web site or android app. Click on company Login link. Company login page opened
Post-Conditions	Successful login
Success Guarantee	Correct login username and password.
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Company enters username and password, the system checked the database, and if correct the company has access to the main layout.

Manage offer means to add new offers in the selective categories by company. In this function, company can manage their offer. In the table 23 below shows how companies can manage their offer once they sign in into the system. Main goal of manage offers was to add new offers in different categories and edit other existing offers under certain categories. Table below shows, how it works with the system. (Fergusson 2018.)

TABLE 22. add offers and link it to category Description in OBO for company. (Oracle 2007.)

Primary Actor	Company
Goal	Add new offers to the system under certain category
Stakeholder	Company
Pre-Conditions	Open the web site or android app. Login Successfully Choose add offers option
Post-Conditions	Successful addition offers to the database under the specified category
Success Guarantee	Verification of entered data, entering all required data, unique and new offer data
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Company after successful login, choose to add new offer option, select the category to add new offer on it, enter all required information in the correct way, the system verified the enter data, if acceptable and meet required conditions, the addition of the offer was successfully completed.

Edit offers by the company, when registered company in the system can edit any offer in any category. In the table 24 below describes all the necessary step for the function edit offer. Companies can directly edit their existing offers. Table below describes the system for the process of editing offers for company. Company should choose the certain existing offers from the system database and then edit as per as company's requirements. (Fergusson 2018.)

TABLE 23. Edit Offers Description in OBO for company. (Oracle 2007.)

Primary Actor	Company
Goal	Search for certain existing offer in the system, to display all its items, and edit its information
Stakeholder	Company
Pre-Conditions	Open the web site or android app. Login Successfully Choose edit offer option
Post-Conditions	Successful find the offer and allow edition of the offer information
Success Guarantee	Find the offer name in the database
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Company after successful login, choose edit offer option, search for offer name as company wants, the system will retrieve the offer info from database and company can edit on the offer information and save it to the Database.

View users feedback function in company use case means, company can review any feedback or suggestion from customers in the system. When company wants to see the feedback from their own customers in the system, company need to successful login. Once logged in to the system, company is allowed to view feedback. In the table 25 below shows the process for this function. (Dragon1 2021.)

TABLE 24. View Users Feedbacks Description in OBO for company. (Oracle 2007.)

Primary Actor	Company
Goal	View user feedback in the system
Stakeholder	Company
Pre-Conditions	Open the web site or android app. Login Successfully Choose Customers feedbacks
Post-Conditions	Successful find the feedback
Success Guarantee	Find the feedback of customers in the database.
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Company after successful login, choose view feedback option, the application should display all the customers feedbacks in the system.

Send inquiries in the system means when company need to ask about offer and other important issue, company directly send inquiries in the system and admin will response to the inquiries. In the table 26 below describes the whole process. Company can directly contact the administrator if there was some important issue appeared in the system. Company should make an inquiry by using application form. In the application form, company needs to fill subject and an inquiry text in proper way. After the application if filled, click on send option. Once you click, the administrator will receive company's inquiry in the system. (Dragon1 2021.)

TABLE 25. Send Inquiry to Admin Description in OBO for company. (Oracle 2007.)

Primary Actor	Company
Goal	Send inquiry to the system admin regarding important issues
Stakeholder	Company
Pre-Conditions	Open the web site or android app. Login Successfully Choose send inquiry option
Post-Conditions	Complete all inquiry fields and send it successfully to the admin
Success Guarantee	Enter the inquiry in the correct place.
Priority	High
Secondary Actor	Web site or android application
Main Success Scenario	Inventory manager after successful login, choose to send inquiry to administrator, and then filled the subject and inquiry text in the correct place and press send. A confirmation message must appear to till that the inquiry successfully sent.

5 SYSTEM DESIGN

System design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system. (Fleming, 2016)

5.1 Introduction

System Designs is the process of defining the architecture of the system, modules, interfaces and data for a system to satisfy the specific requirements in the system. The purpose of the system design process is to gather or provide required amount of information and enough detailed data about the system. System design defines the design of the OBO. It contains specific information about the expected input, output, classes, and functions. The interaction between the classes to meet the desired requirements. (Fleming 2016.)

5.2 Design Method

Design method includes the processes, techniques or tools used for designing a system. It provides various number of activities that designer might use for designing procedure. The design module of this system (OBO) uses an object-oriented model which is based on the basic idea of information hiding. In this modelling, the system was viewed as interacting objects with their own private state. (Wilson 2020.)

5.2.1 ER Diagram

ER diagram is the graphical representation of entities and their relationships to each other. Basically, it used for computing of data with database. Relationship between entities shows how data is shared between entities. There are three different types of relationship between entities: one to one, one to many and many to many. (Chapple 2019.)

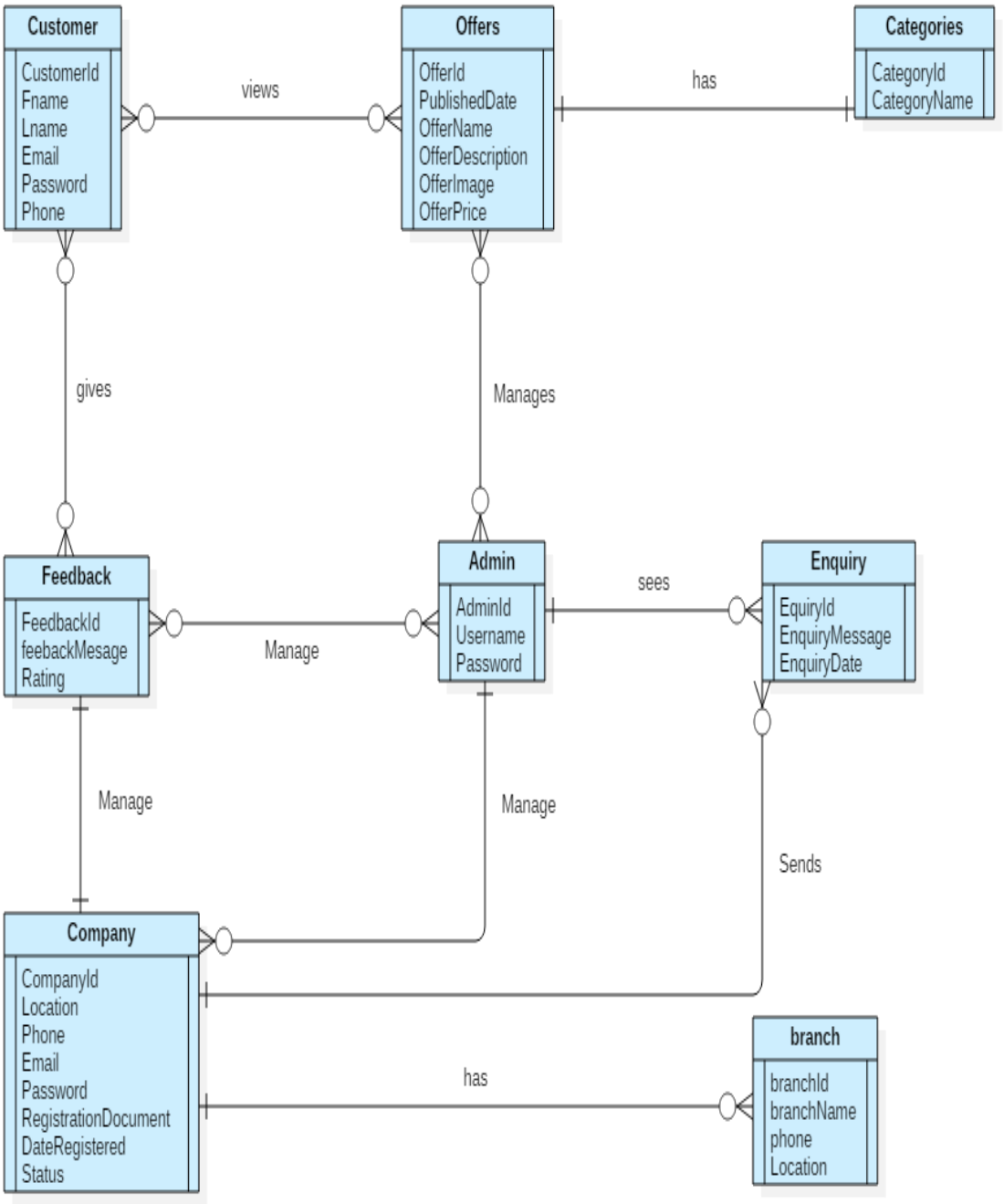

FIGURE 8. ER Diagram Showing relationship between entities. (copes 2019.)

5.2.2 Activity Diagram

Activity diagram is one of the important diagrams in design modelling in UML. It describes the dynamic character of the system. It is a flowchart which represent the flow from one activity to another activity. The activities in the system are describe as an operation of the system. The purpose of the activity diagram is to draw the activity flow of the system, it also describes the path or sequence from one activity to another activity in the system and, it describes the parallel, branched, and concurrent flow of the system. (Ph.D. 2016.)

In the system OBO, there are three different types of activity diagram, they are Admin activity diagram, company activity diagram and User activity diagram which are shows in the figure 9, figure 10 and figure 11 below respectively.

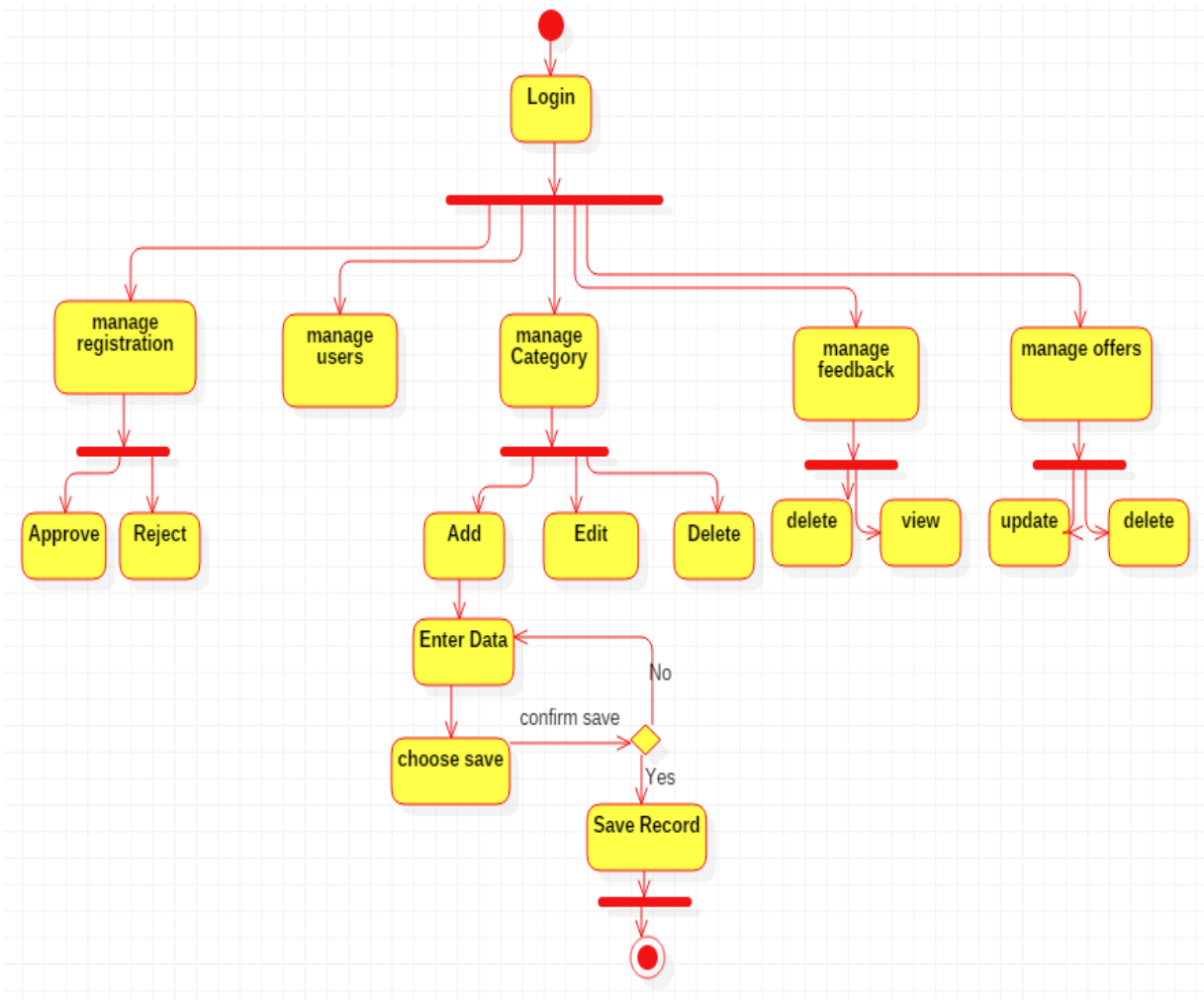

FIGURE 9. Admin Activity Diagram in OBO. (creately 2021.)

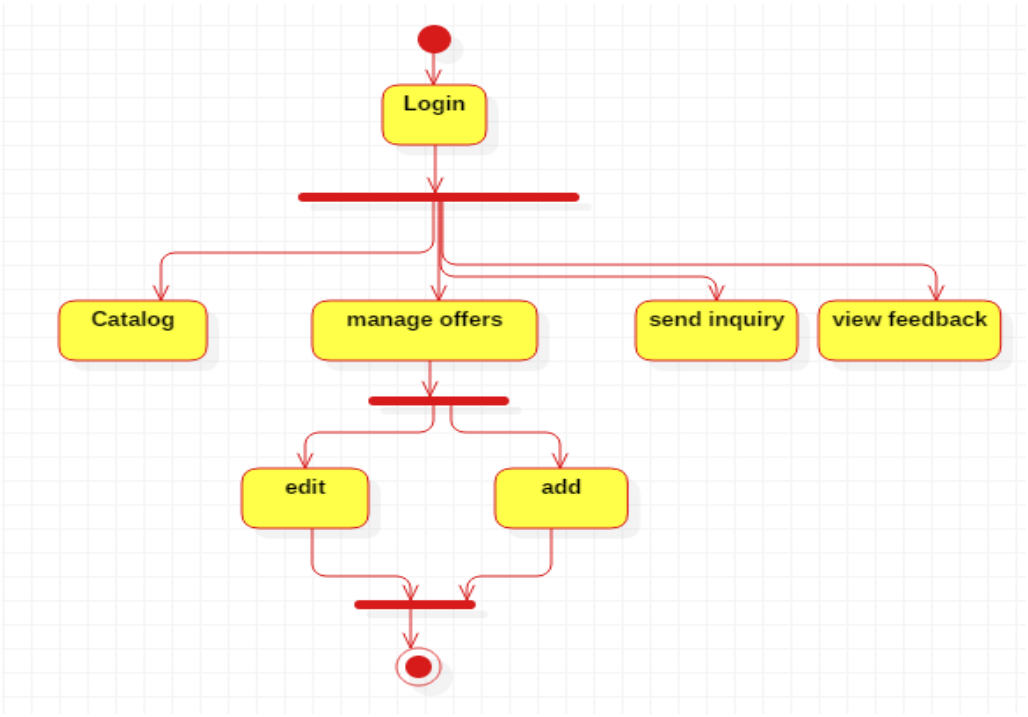

FIGURE 10. Company Activity Diagram in OBO. (creately 2021.)

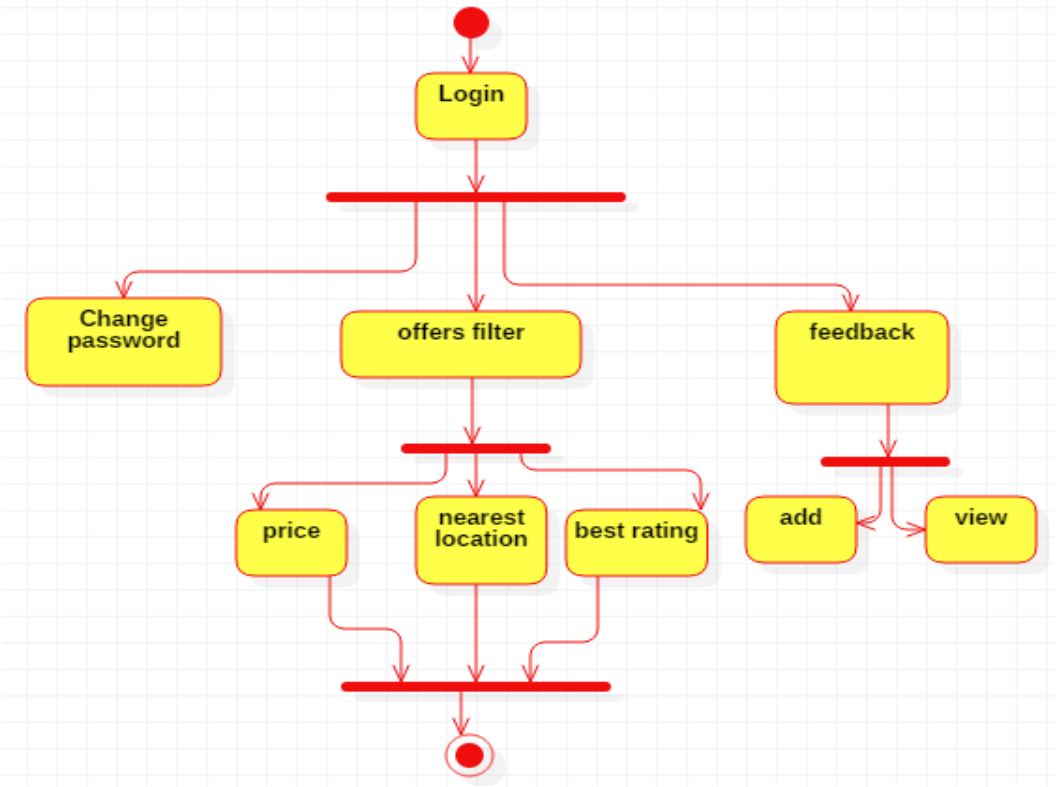

FIGURE 11. User Activity Diagram in OBO. (creately 2021.)

5.2.3 Sequence Diagram

Sequence diagram is one of the interaction diagrams because it shows how and in what order operations are functioning. They represent the interaction between objects in the context of a collaboration. Sequence diagrams are also called event diagram or event scenarios. They are time focused, and they perform the order of the interaction visually by using the vertical axis of the diagram to capture time. (Chonoles 2018.)

In the figure 12, figure 13, figure 14 and figure 15 below describe the sequence diagram of admin manage registration, company register, user filter offer and company add offer respectively. In the figure 15 below shows how the admin can control the registration process. Sequence diagram shows all the necessary process during registration.

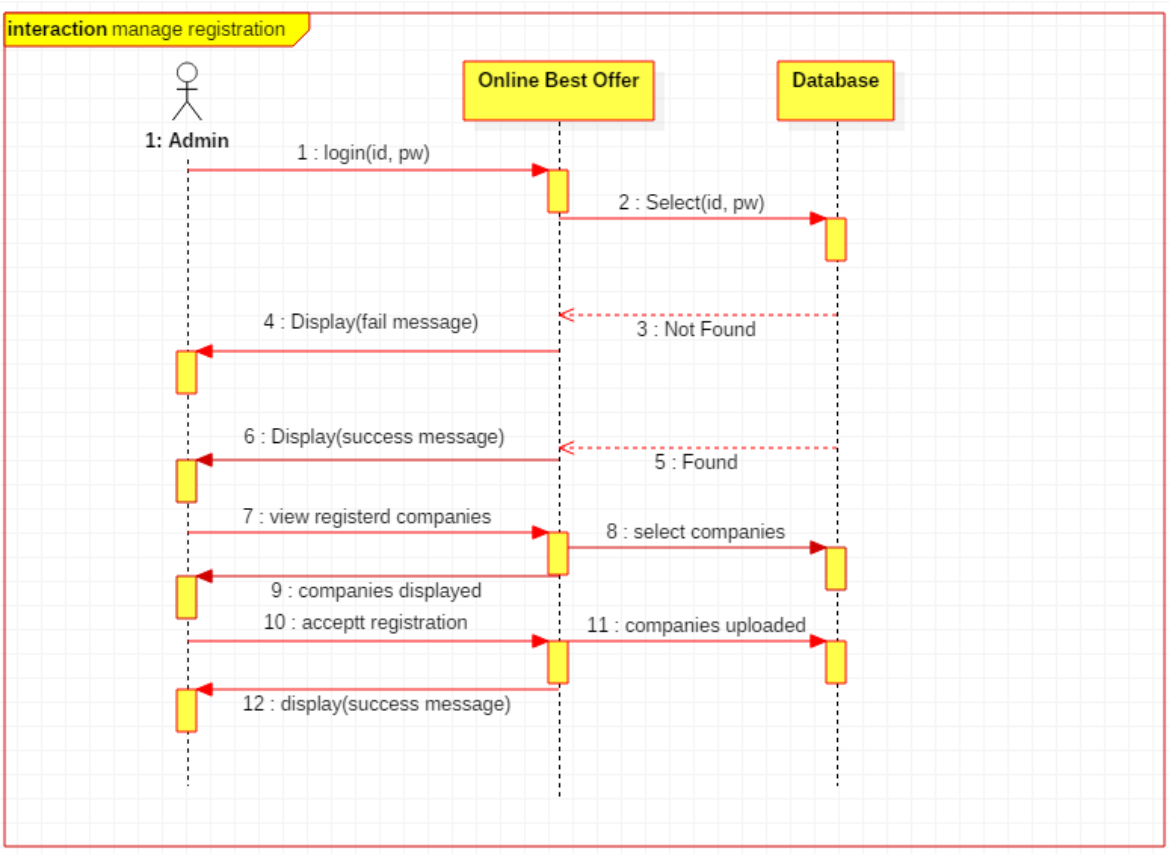

FIGURE 12. Admin Manage registration sequence diagram. (Edrawsoft 2019.)

In figure 13 below shows all the process for company registration, the sequence shows all process to register company into the system.

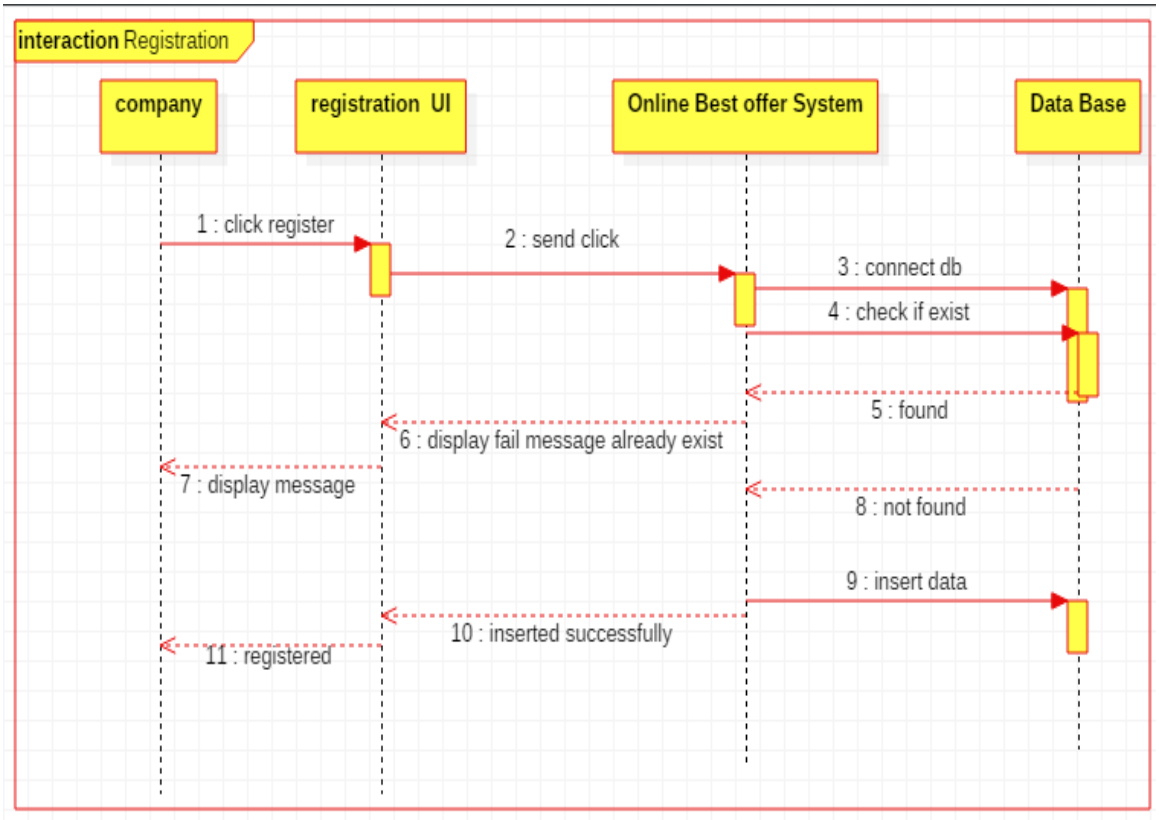

FIGURE 13. Company registers sequence diagram. (Creately 2021.)

Figure 14 below shows all process for user filter offer. The figure below shows how user can filter offers in sequence form.

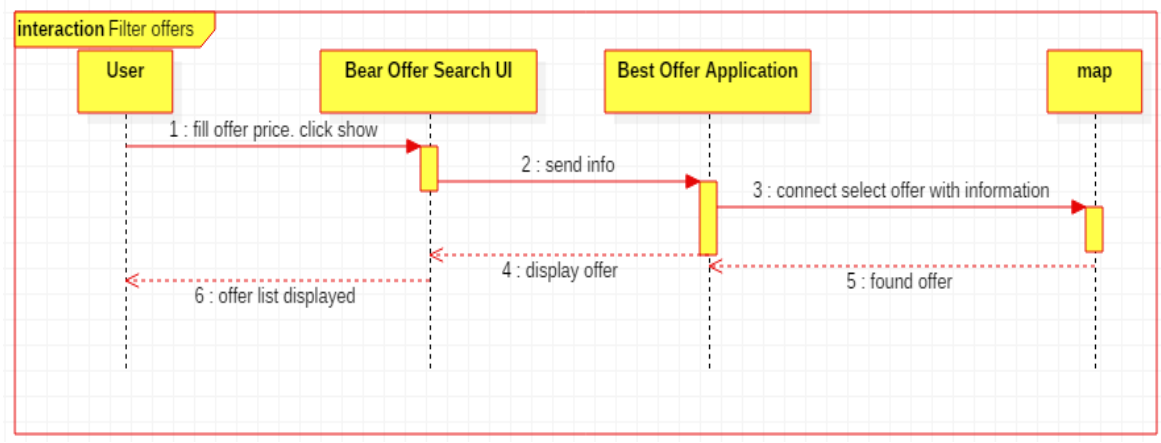

FIGURE 14. User filters offer sequence diagram. (Creately 2021.)

Figure 15 below shows the how company add offer in the system in sequence form. All possible process is shown in the below sequence diagram.

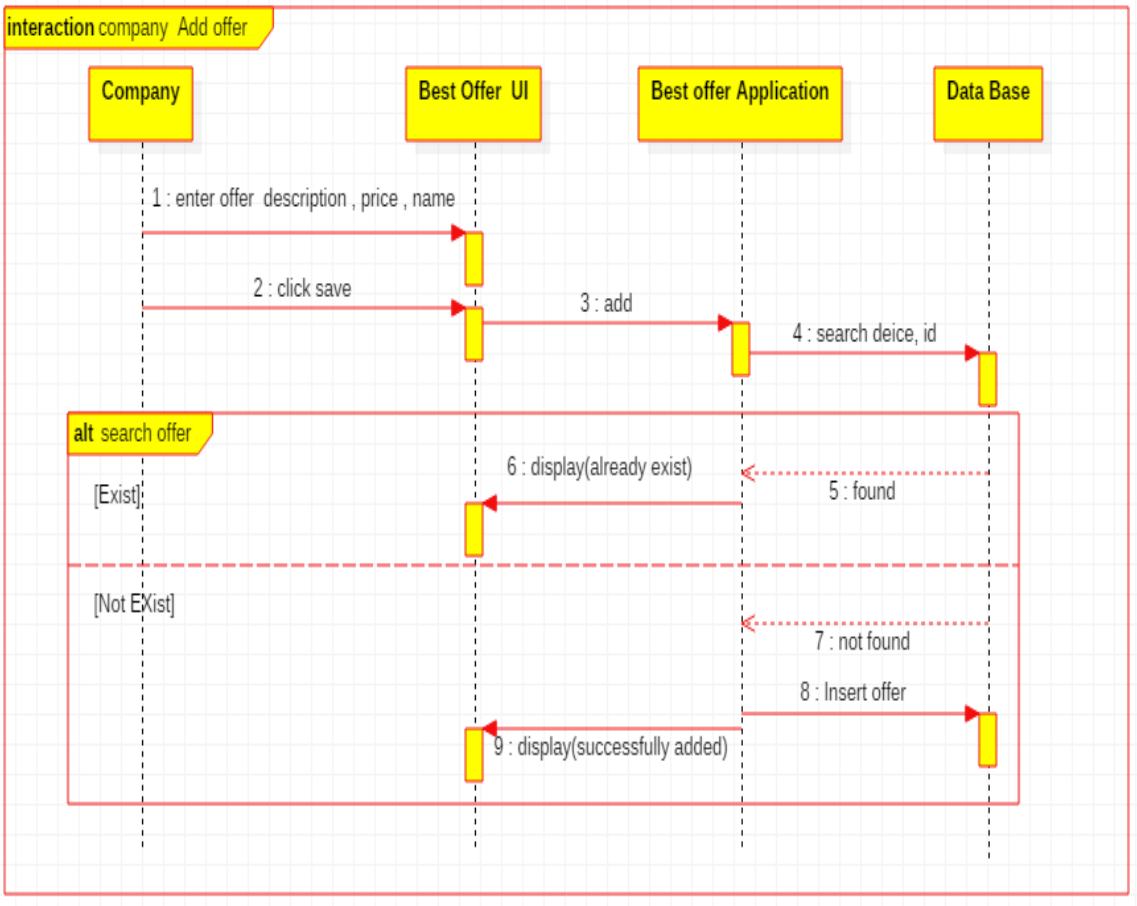

FIGURE 15. Company add offer sequence diagram in OBO. (Edrawsoft 2019.)

5.2.4 Class Diagram

Class diagram represents the static view of the system. It describes the attributes and operations of a class. Class diagrams describe the collection of classes, interfaces, associations, collaborations. Class diagram also called as a structural diagram. (Bell 2004.)

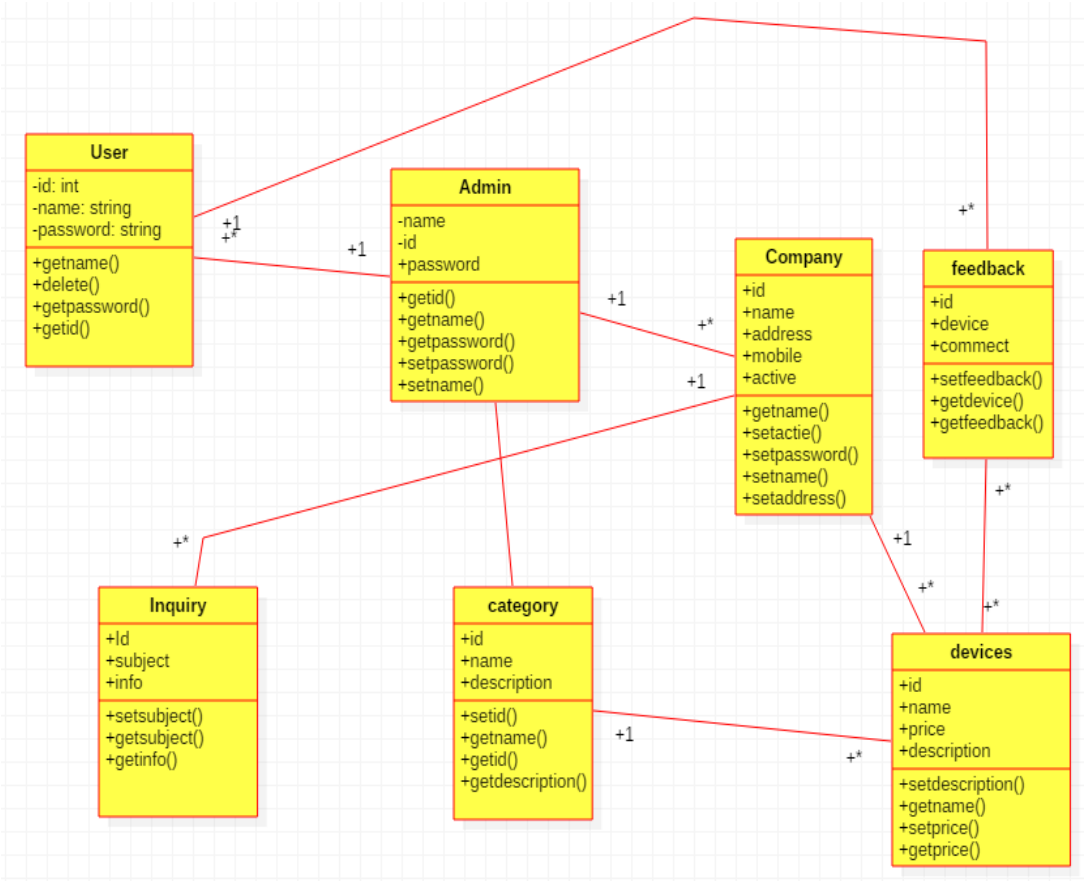

FIGURE 16. Online Best Offer Class Diagram in OBO. (Smartdraw 2019.)

5.2.5 Data Flow Diagram

A data flow diagram (DFD) is a graphical representation of the flow of data through an information system. A data flow diagram is often used as a preliminary step to create an overview of the system. DFDs can also be used for the visualizations of data processing (structured design). A data flow diagram shows what kind of information will be input and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about the process timing or whether processes will operate in sequence or control flow or a UML activity workflow diagram, which presents both control and data flows as a unified model. (Scheel 2015.)

Data follow diagram has four different symbols, they are a square defines a source or destination of system data, an arrow identifies data flow. It is the pipeline through which the information flows, A circle or a bubble represents a process that transform incoming data flow into outgoing data flows and a circle, or a bubble represents a process that transform incoming data flow into outgoing data flows. All the DFD symbols are shows in the figure 17 below.

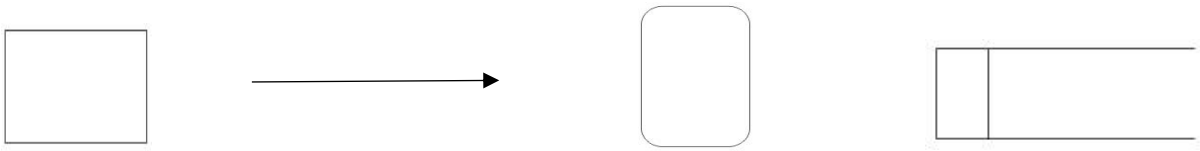

FIGURE 17. Four diffrent symbols in Data flow diagram. (Kozar 1997.)

In OBO there are three different types of data flow diagrams, they are 0 level DFD, 1 level DFD and 2 level DFD. In the figure 18, figure 19 and figure 2o below shows the 0 level DFD, 1 level DFD and 2 level DFD respectively.

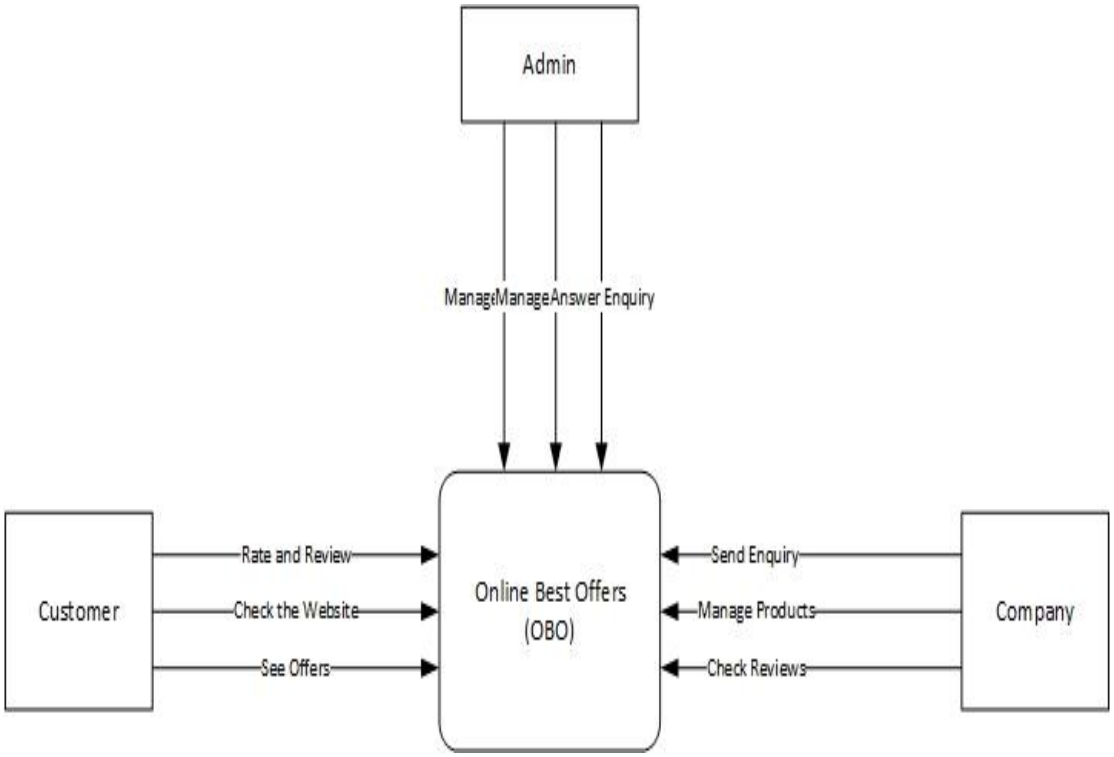

FIGURE 18. **0** level DFD. (Bangerter 2019.*)*

FIGURE 19. 1 level DFD in OBO. (Bangerter 2019.)

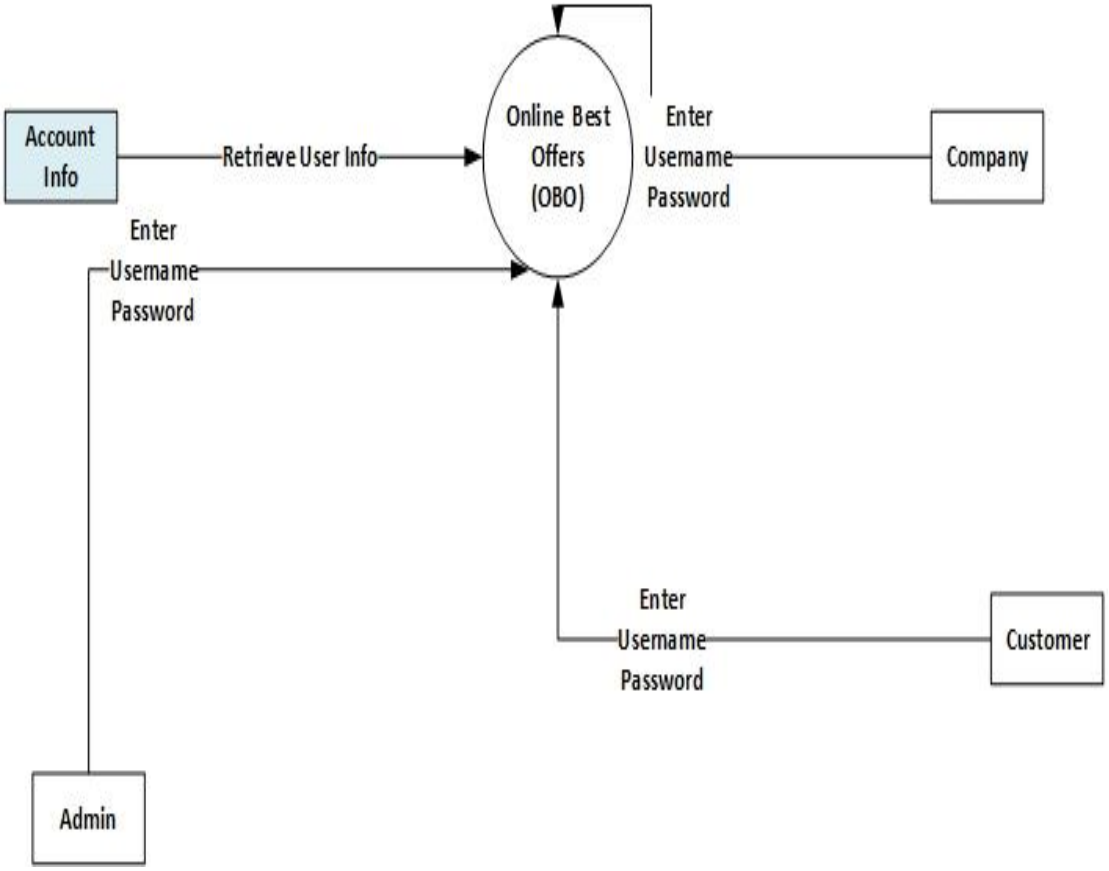

FIGURE 20. 2 level DFD in OBO. (Bangerter 2019)

6 CONCLUSIONS

The main goal of this thesis is to propose a web application based on finding best offers and best items for our daily purposes. This thesis highlights the problem associated with lack of marketing policies for offers and items in small cities in Nepal. How people spent time and money to find offer and best items as they want. So, this thesis describes how to solve this problem. How a simple web application can help to find the best offer among all the supermarket in cities**.** The thesis contains three different actors, they are Administrator (Admin), Company and Users (Customer). The thesis shows how the system hold both company and users together for their respective benefit.

The thesis focuses on the users benefit and need. It also includes the development process of simple web application, the tools and idea that can be used to create a new web application. It includes the architectural understanding, system design, classification of actors and system mechanism, which easily catch readers concentration.

Every part inside thesis is well defined, so that the reader can design their own web application as per as their wants. This thesis leads reader to very simple web application, but we have tried to mention all information so that the reader can modify their application as per as their want. We learned a lot while working in this thesis and still found a lot of improvement need to do.

In future, if the reader wants to add some function in the system, then they can integrate digital payment system and real time chat system. These functions are directly improving your web application. In digital payment system, user can pay respective amount directly to company using various online payment method (PayPal, e-sewa etc..). And real time chat system can allow customers to contact with company and get more information.

This thesis has concern on gathering all the information of web-based application and describe how it can be an ideal for application like OBO. The thesis includes all required information for reader to get idea to create web application and how it can be beneficial for our society. The idea behind this thesis came from my home city in Nepal, where supermarkets are still using paper-based advertisement to promote their offers.

Technology makes life easier, faster and its already a part of quality life. People has different opinion about technology and quality life. Technology should improve in every corner of the society for people's quality life.

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APPENDIX 1

During our field visit in capital cities, big cities, and small cities in Nepal, we prepared some question based on ecommerce, online shopping, serving internet and others question related to our topic. As per the result gathered from this, we planned to start OBO as our thesis.

The questionnaires are presented below.

What is your age?

- 10 - 20+
- 30+
- 40+
- 50+

Do you used internet?

- Yes
- No
- N/A
- I do not know.

Do you used to buy Internet package?

- Yes
- No
- N/A
- I do not know.

How often you used internet per day?

- 1 hour + /day
- 2 hours + /day
- 3 hours + /day
- …….. hours /day

Which of the following is used for serving internet?

- Cell phones
- Laptops
- Cyber café
- Others (……)

What is the purpose of serving Internet?

- Social media
- Study
- Games
- Shopping
- Others (…….)

Do you know about ecommerce?

- Yes
- No
- N/A
- I do not know.

Do you used internet for shopping?

- Yes
- No
- N/A
- I do not know.

How often you used internet for shopping?

Ans: …….

Do you used application or website for online shopping?

Ans: …….

Do you used any application for online shopping?

Ans: …….

Usually, which item you prefer for shop in application?

Ans: …….

Which payment service you used during shopping?

Ans: …….

What is the good thing of online shopping?

Ans: ……
……
……

What is the main problem during online shopping?

Ans: …….
……
……

What is your expectation for shopping application?

Ans: …….