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# Chapter 2 Analysis

## 2.1 Introduction to Analysis

It is one of the very important phase while making some products or projects. Without analysis our project/products is bound to fail. Simply it is the process of dividing the topics into different parts to get better knowledge of it. It is the phase where we must find what user needs and collecting all data to make better or improve the made product.

Features of analysis in my project are as follows:

* It is very important to proceed our project further.
* In helps in collecting data on project.
* It is the place where system analysis takes place.
* Helps in analyzing the need of end user so that the new system or upgraded system will meet the expectation of end user.
* It helps to find what problem user are facing.

## 2.2 Analysis Methodology

It is a systemic, theoretical analysis of methods applied to field of study. It also incorporates the concepts such as quantitative or qualitative techniques, paradigm, phases etc. There are different type methods in software development like soft system methodology, hard system methodology, etc. Among all of the methods I have decided to use the Soft System Methodology.

Soft System Approach (SSM)

It is a way to deal organizational process modelling and also it can be used for both general problem solving and the change of management. It was developed by academics at University Of Lancaster in System department for 10year action research program in England. It is the most used method and practical application of system thinking. The primary use of SSM is done in case of analysis needed in complex situation. These situations are soft problems like: What system need to do? And how will it do? Etc.

SSM is processed in several types of steps as follows:

1. Problem Finding

It is the stages where we find what problems are there now so that we can minimize or fully solve in this new projects. As we get details from ABC Shoe Factory they have many problems in their system right now. We can also do interview, do survey to find more problems. As I checked into their current site:

* Their system is not well responsive.
* They don’t have many online facilities right now.
* Customers and Visitors can’t get proper details of shoes.

1. Expressing The Problem Situation

This stages involves the communication and validation of investigator’s ideas about problem situation. There are many various tools which can used to check the investigator’s ideas but the main technique is drawing the Rich Picture. Rich Picture is a part of SSM that provide mechanism for learning complex problems by detailed diagram. Rich Picture for my project is as follows:

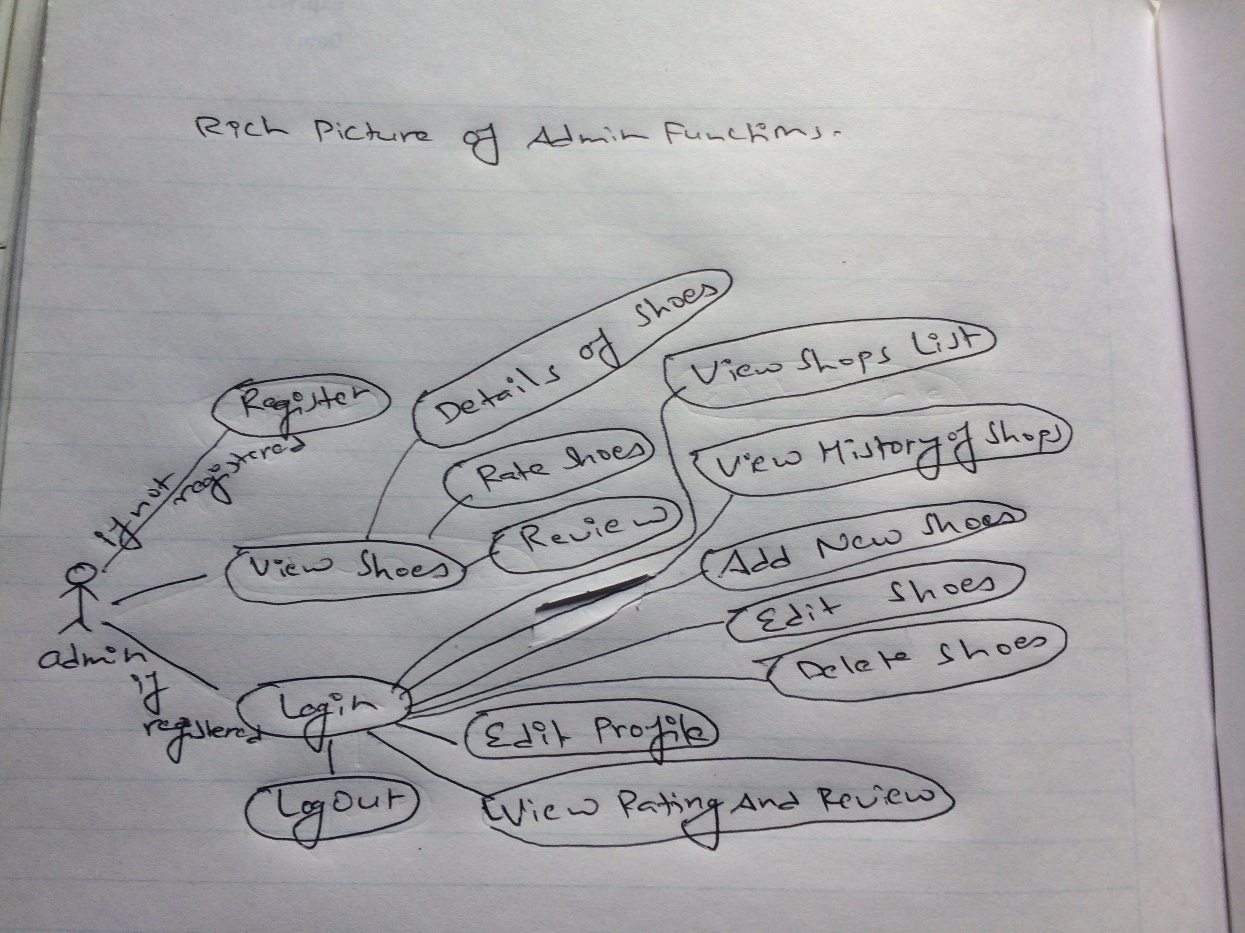


Diagram: Admin Function RP

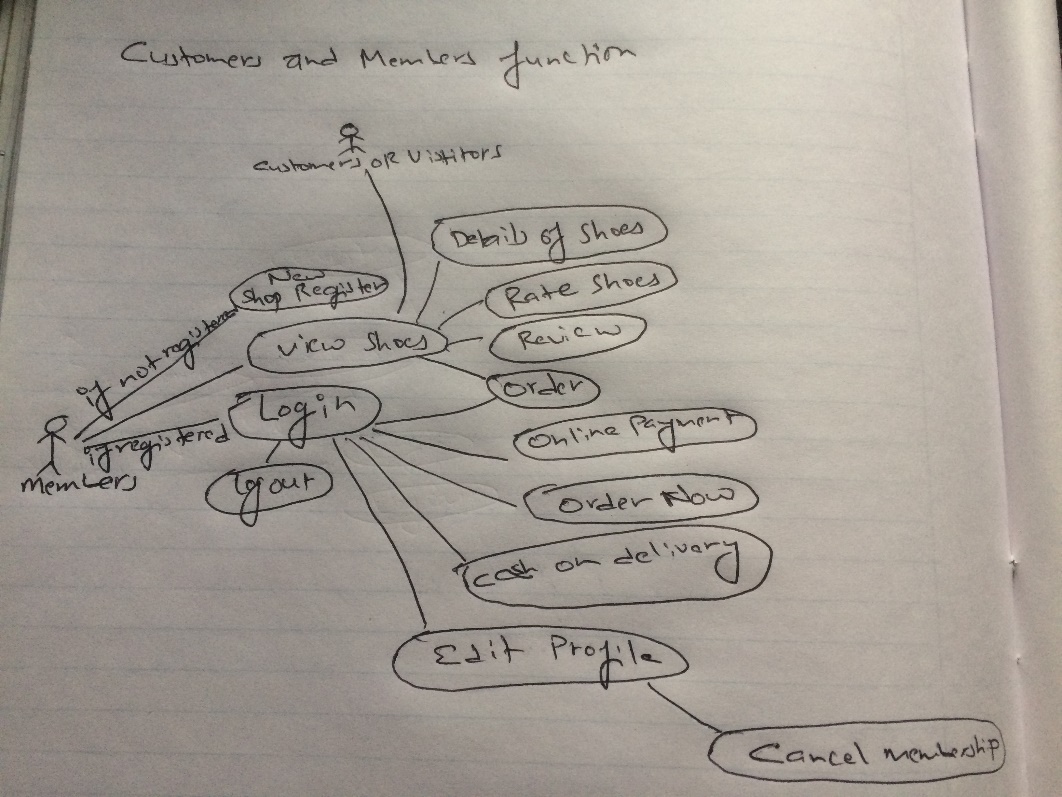


Diagram: Members and Visitors Function RP

1. Deriving Root Definitions Of Relevant Systems

Root Definition is the purpose of system of human activity. System of human activity never has a single purpose. It have two steps involved in producing root definitions:

Input, Output transformation Diagrams = what the system is to achieve or change

CATWOE framework = to produce Root Definition for each transformation

The first step in a CATWOE analysis is identifying such**customers** and understanding how the **process** or system affects them.

CATWOE analysis is about identifying customers and shop members and knowing how the system process affects them.

CATWOE stands for:

C= Customer

A=Actors

T= Transformation Process

W= Worldview

O= Owner

E= Environmental Constraints

1. Deriving Conceptual Models

Deriving Conceptual Model is a process of analyzing the activities which must be involved to clearly define what actors must do to achieve results. We don’t have to include activities which will be not done by actors.

The Conceptual Model prepared for my project is as follows:

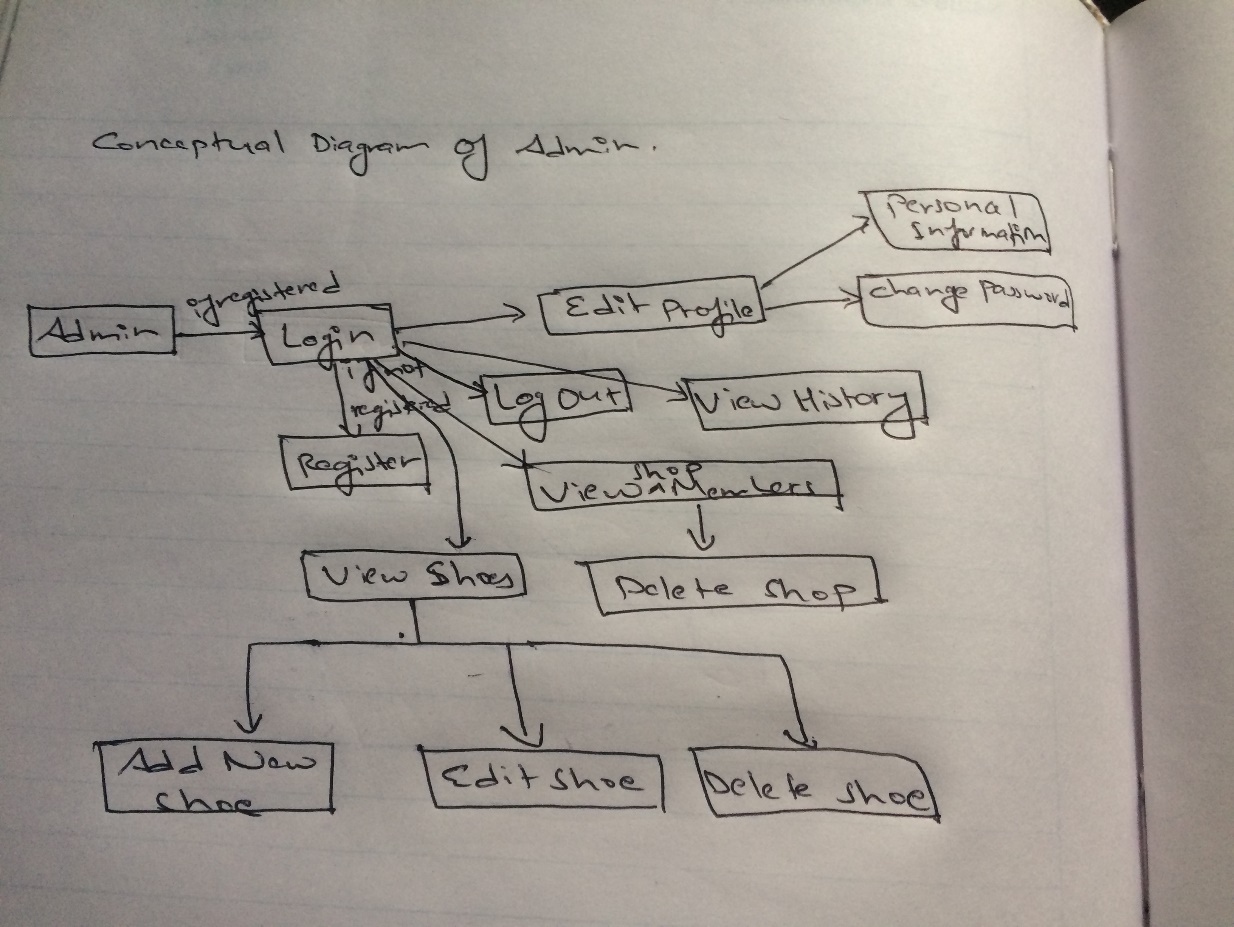


Diagram: Conceptual Model Admin

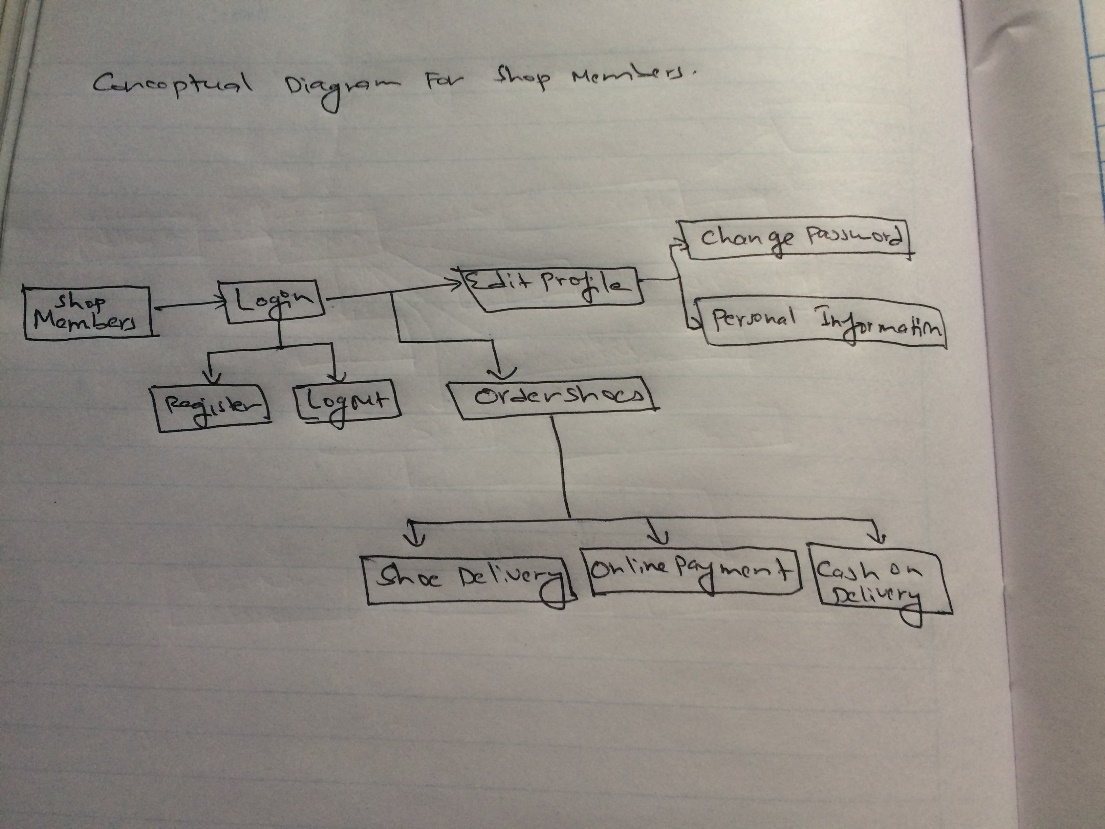


Diagram: Conceptual Model Members

1. Comparing Conceptual Model in Real World.

The best thing of SSM is that we are never allowed to forget that our model does not represent the real world. This steps compares the Conceptual Models with the real time project.

|  |  |
| --- | --- |
| Conceptual Model | Real World |
| All the shops can register as member and place the order for shoes. | This Project is only based on Nepal so for now only shops from Nepal can place orders. |
| Orders will be delivered in the requested time. | If some problem arises orders might not be delivered in time. |

## 2.3 Feasibility Study

After the proposal is accepted the next phase we do is to examine the feasibility of the system. Feasibility Study is the test of proposed system in its workability, user’s requirements, effective use of resources etc. Project is called successful when we finish it in time with given budget and main goal of Feasibility Study is not to solve problem but to achieve the scope. Following decision are taken in different feasibility study:

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | Feasibility Study | What does It Do? | Relation To Project |
| 1 | Economic Feasibility | If given Budget for Project will be feasible? | We don’t have to do extra spend in like GPS because location of shops will be fixed so given Budget will be feasible. |
| 2 | Time Feasibility | If the given time for project will be feasible? | As we have already developed WBS and Gantt chart to manage time so as long as project goes as planned it will be finished in time. |
| 3 | Operational Feasibility | If the project will be advantageous and solve the problems? | Project will help the shops to get which shoes they want in stock by selecting in site and it will help customers also to check details of shoes. |
| 4 | Technical and Resources Feasibility | Is current skills and resources are enough to complete the projects? | I have Good laptop with good internet connection to develop the project and my skill not professional but getting better with time. |
| 5 | Social Feasibility | Will project be accepted in society and cause any social issues or not? | My project is to make system for shoes factory which does not give any harm to society so it will be accepted. |

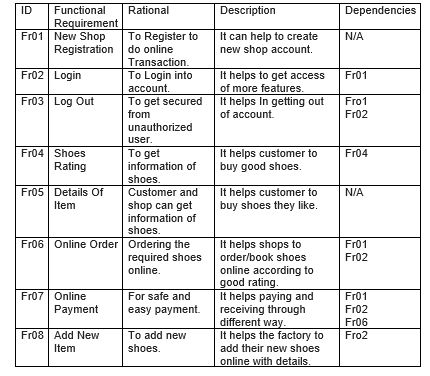
Table: Feasibility Study

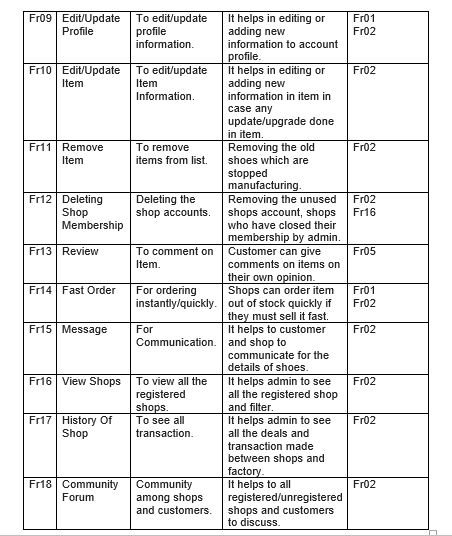
## 2.4 Requirement Analysis

### 2.4.1 Functional Requirement

Functional Requirement is an essentially specifies something the system should do. Typically functional requirements are requirements or features which are arranged to include system or program to be made.

The functional requirements that are needed in my project are listed in table below:



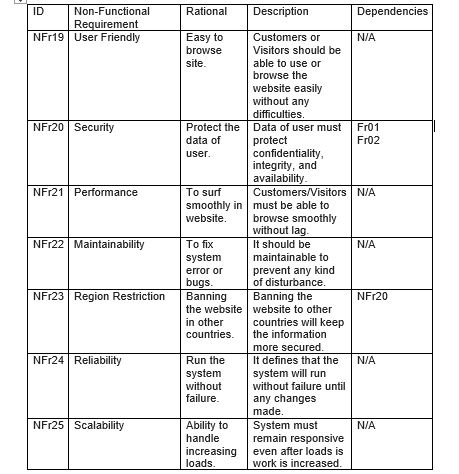


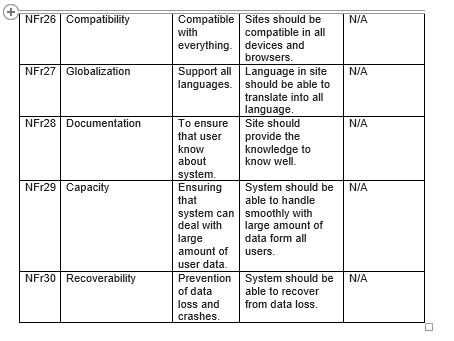
Screenshot: Functional Requirements

### 2.4.2 Non-Functional Requirement

Non-functional requirement is that it essentially specifies how the system should behave and it’s a constraint upon systems. It is also quality attributes of a system. It cover all the remaining requirement which are not covered by the functional requirement.

The Non-Functional requirement for my project are listed in table below:



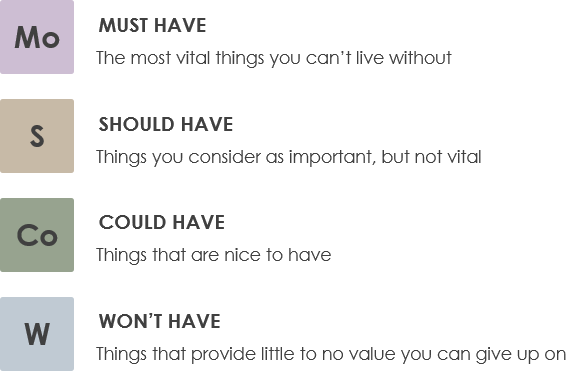


Screenshot: Non-Functional Requirements

### 2.4.3 MoSCoW Prioritization

MoSCoW prioritization also known as the MoSCoW method or MoSCoW analysis is popular technique for arranging requirements. The MoSCoW stands for 4 different categories:

Mo: Must Have, S: Should Have, Co: Could Have, W: Won’t Have. Sometimes “W” used to stand for “Wish”. This method shows the level of requirements. It is also used in our daily lives by figure below:



The MoSCoW method prepared for my project is shown in table below:

|  |  |  |  |
| --- | --- | --- | --- |
| ID | Title | MoSCoW | Description |
| Fr01 | New Shop Registration | Must Have | It is important to register new shop. |
| Fr02 | Login | Must Have | It is important to gain more features from sites. |
| Fr03 | Log Out | Must Have | User should get out at their free will to be more secure. |
| Fr04 | Shoes Rating | Should Have | This helps people to get top shoes but different people have different likes. |
| Fr05 | Details Of Item | Must Have | Customers must be able to know the details of shoes. |
| Fr06 | Online Order | Must Have | Shops must be able to online for better deal. |
| Fr07 | Online Payment | Must Have | They must be able to do online transaction for safe receiving and payment. |
| Fr08 | Add New Item | Must Have | New shoes must be able to add in the site. |
| Fr09 | Edit/Update Profile | Must Have | User must be able to edit or add new information. |
| Fr10 | Edit/Update Item | Must Have | Admin must be able to edit the details of item if any change made in the item. |
| Fr11 | Remove Item | Must Have | Admin must be able to delete the old item which are stopped manufacturing. |
| Fr12 | Deleting Shop Membership | Must Have | Admin must be able to delete the users after membership is closed. |
| Fr13 | Review | Should Have | Customer should be able to comment about the shoes. |
| Fr14 | Fast Order | Must Have | Shops must be able order fast for better customer satisfaction. |
| Fr15 | Message | Should Have | Customer and shops should be able to communicate. |
| Fr16 | Shops List | Must Have | Admin must be able to keep track or monitor the users. |
| Fr17 | History Of Shop | Must Have | Admin must be able to all the deals and transaction made with all shops. |
| Fr18 | Community Forum | Should Have | Customer should be able to discuss among themselves. |
| NFr19 | User Friendly | Must Have | Site must be user friendly so everyone can surf easily. |
| NFr20 | Security | Must Have | Everything must be secured for safe transaction. |
| NFr21 | Performance | Must Have | Site must be very responsive no matter how many people are visiting. |
| NFr22 | Maintainability | Should Have | System should be able to fix the bugs and errors. |
| NFr23 | Region Restriction | Could Have | Site could have been banned in other countries. |
| NFr24 | Reliability | Must Have | System must be able to run without failure. |
| NFr25 | Scalability | Must Have | System must have good response even loads is increased. |
| NFr26 | Compatibility | Should Have | Site should be compatible in all device to all browsers. |
| NFr27 | Globalization | Should Have | Site should have the language translation function so that people from all country can surf easily. |
| NFr28 | Documentation | Should Have | It helps in documenting easily. |
| NFr29 | Capacity | Must Have | System must be able to deal with large amount of data from all users. |
| NFr30 | Recoverability | Must Have | Data can be loss anytime so system must be recoverable. |

Table: MoSCoW Prioritization

### 2.4.4 System Requirement Analysis

The System Requirement Specification is a structured collection of information which shows what or how much system needs to work properly. It also shows the details of hardware and software that are required to develop the project properly.

Hardware and Software required for developing my project and after developed to use the product I have listed in a table below:

* Requirements Before project

|  |  |
| --- | --- |
| Software’s | Hardware’s |
| Sublime  Windows 7/8/8.1/10  My SQL Database  XAMPP  Mozilla Firefox/ Google Chrome  Star UML | Laptop/ PC  RAM (4Gb+)  Up to 100GB free Hard Disk Space |

* Requirements/Specification

|  |  |
| --- | --- |
| Software’s | Hardware’s |
| For PC/Laptop:  Windows 7/8/8.1/10  For Mobiles:  Android 4.0+  IOS 8.0+  Browsers:  Mozilla Firefox, Google Chrome, Safari etc. | Internet Connection  Android OR IOS devices  Laptops OR PC with minimum:  Duo Core Processor  2GB Of RAM  500MB+ Hard Disk Space |

## 2.5 Use Case Diagram

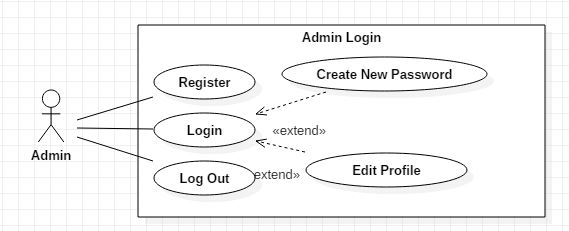
Use Case Diagram is a representation of a user interaction which shows the relation between users with many different use cases where user are involved. Use cases are represented by circles or eclipse. It can identify the different type of users of system and also different use cases and often accompanied by other types of diagrams also.

The advantages of using use case are as follows:

* It helps in capturing the requirements of system and validation the system architecture.
* It helps in specifying the system context and implementation of drive and generate test cases.
* It helps to understand system and process well.
* It also show the relations between different functions.

Use case diagrams that I have made for my project are as follows:

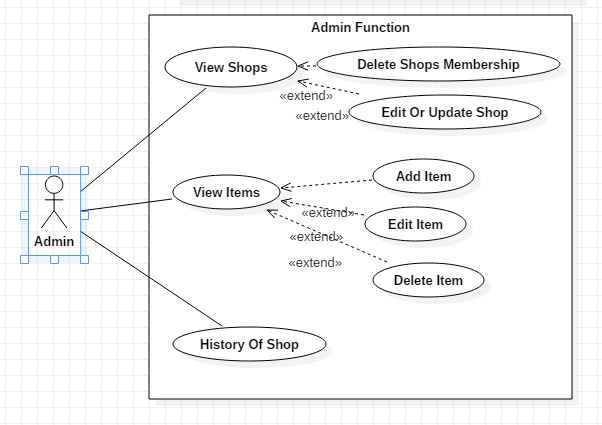
* Admin Login



Screenshots: Use case Admin Login

Here, Admin can Login into their profile. If there is new admin without account they can create new profile. They can also change their password and edit/update their profile if needed. They can also log out form their profile free will.

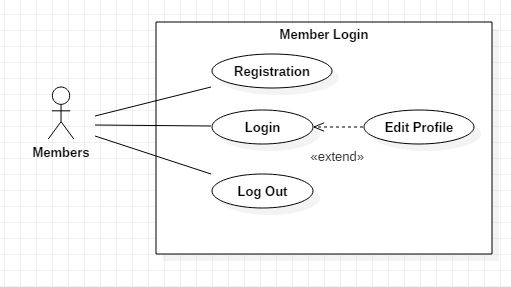
* Admin Functions



Screenshot: Use case Admin Functions

Here, after logging in admin will also have many features they can do. They can see the list of all members shop. They can delete the shops membership and edit/update the information of shop if any change made by shops. They can also see all the shoes manufactured in factory. They can add new shoes, edit/update the shoes and delete the shoes which have been stopped manufacturing. They can also see all history with transaction made with shops.

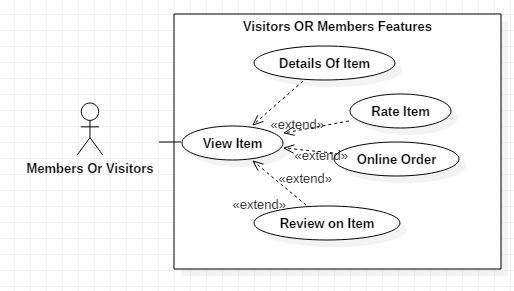
* Members Login



Screenshot: Use case members login

Here, Members can Login to their account and if new shops want to register their shop then they can do it. Members can also edit/update their profile where they can change password, and can change personal information. They can freely log out of their profile.

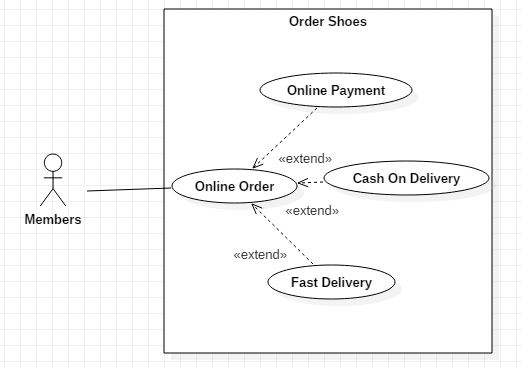
* Features Of Visitors and Members



Screenshot: Members Or Visitors Functions

Here, as we know besides shop members visitors and customers can also visit the website. So they can view all the shoes available in factory. They can also see the detail of shoes, give comment on the shoes and rate the shoes. But only Shops members can order the shoes because it requires login function.

* Members Ordering Shoes



Screenshot: Member Order Function

Here, after clicking on Online Order like shown in above screenshot. Members can book the shoes according to their needs. They can use the fast delivery function and give the time details up to when they needs the shoes to be delivered. They can also pay after delivering with cash or pay online with bank account, e-sewa etc.

## 2.6 NLA and Initial Class Diagram

ABC shoe factory is one of the top shoes manufacturing company of Nepal. It manufactures many designs of shoes which are in trend. It also manufactures the copy of top companies shoe like Nike, Adidas etc. But the current system of this factory is not good responsive with very low features so the company have asked me to make better system for company.

For making better system I have add many new features to make new system better. As we know in today generation people prefer online so I have added many online features to make better system like: User can register(which holds Shop name, owner name, shop location, phone number, e-mail, password will be saved in database) their shop and can login to our websites. They can Order the shoes online, and pay online. They can also edit/update their profile if needed and cancel the membership any time. They can also message which will be viewed by admin. Customer can visit the websites to view the details of shoes, rate the shoes, comment on the shoe. Customer can also discuss among them in community forum. Now Admin can Login and View all the Shop members and delete the Shops who have cancelled their membership. They can also check the transaction made with Shops. They can View Items, Add New Item, Edit/Update Item, and Remove Item.

I have decided to add these features for now but system it will be keep on upgrading to new features.

NLA for my scenario is shown in table below:

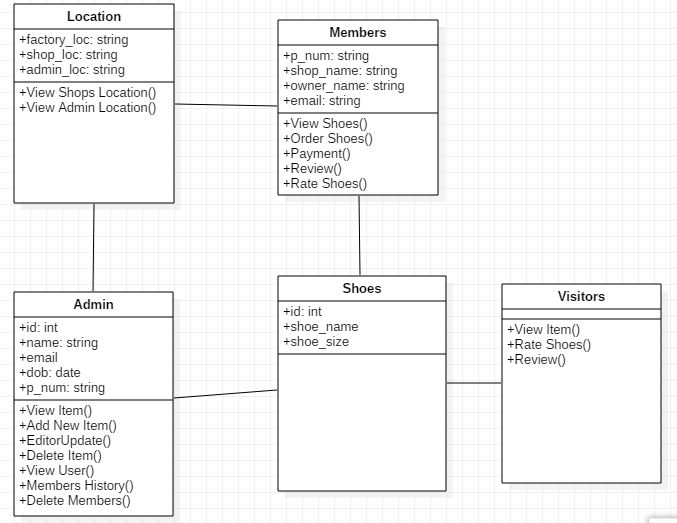
|  |  |  |
| --- | --- | --- |
| Candidate Classes | Candidate Attributes | Candidate Methods |
| Shoes  System  Admin  Database  Users | Is  Name  E-mail  Location  Phone Number | Edit  Update Add  Remove  Delete |

Table: NLA OF Scenario

Initial Class Diagram

Class diagram is an illustration of relationships and source code dependencies among classes in UML (Unified Modeling Language). Here classes are arranged in groups which have common characteristics. It resembles a flowchart where classes are kept in boxes which have three box inside where top contains name of class, middle contains attributes and bottom contains operations. Lines is used to connect many boxes which have relationships between the classes.

Class Diagram for my project is as follows:



Screenshot: Class Diagram