

Department of Computer Science and Software Engineering

**Model Driven Software Engineering
COEN-6312**



Deliverable - 2

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1.Introduction

Online real-estate system requires the development of automated system which can be one place stop for users to buy or sell their desired property in time and cost saving manner. The demand for on the go software is rising with the advancement of the technology. Hence, we are developing an online system which is the one place stop for both buying and selling properties which is a huge time and cost saving option for both buyers and sellers. Here users can be both buyer and seller. Seller can post the advertisement and also edit and delete their advertisements. Buyer can search property with desired searching criteria and display the filtered result on the screen. Seller makes an offer for property and the same post is listed for buyer, if interested they can communicate with the seller through the mode of messages .The system is designed in such a way that both buyer and seller can communicate through messages and can give heads up to the deal It also enables them to search for the property according to their preference such as region, property type, and property size and so on. User has the ability to include or exclude facilities near the property viz. schools, hospitals and basic amenities. One of the advantages of using this system is that one can make an offer on property which will be indicated for 3 days and after that period of time, the offer will be deleted automatically.

1.1 Constraints and assumptions

- Customer account is secured using a combination of user ID and password. Internet is also another major requirement as it is an online application.
- There should be no downtime cases except maintenance and up gradation phase of software.
- The system shall be used by various users like buyer, seller or admin.
- The system shall meet the copyright standards.
- The system shall run in any operating system environment.
- The sold property should appear on the system for 15 days including the notification that it is sold.
- Buyer can't pay online to buy any property.
- Less complex, understandable and error free coding techniques.

- Central database to store the information and to work with the system.

2.Stakeholders Description

Identifying the stake holders of the system is one of the important aspects of developing it as these stakeholders are the key role players of the system.

A stakeholder can be defined as a person, group or an organization who has actively concerned and interested in the project, affected by the project, or they can influence its outcome. Following are the stakeholders and their description that are either directly or indirectly related to online

<u>Name</u>	<u>Description</u>
Buyer	User who wants to buy listed properties.
Seller	Can post advertisement of the property and can edit/ update/ delete that advertisement.
Administrator	Manages users, advertisement of properties, and security of the system
Guest viewer	Any person can visit the online system and is called guest viewer.

Table 1: Stakeholders of the system

2.1 Classification of Stakeholders

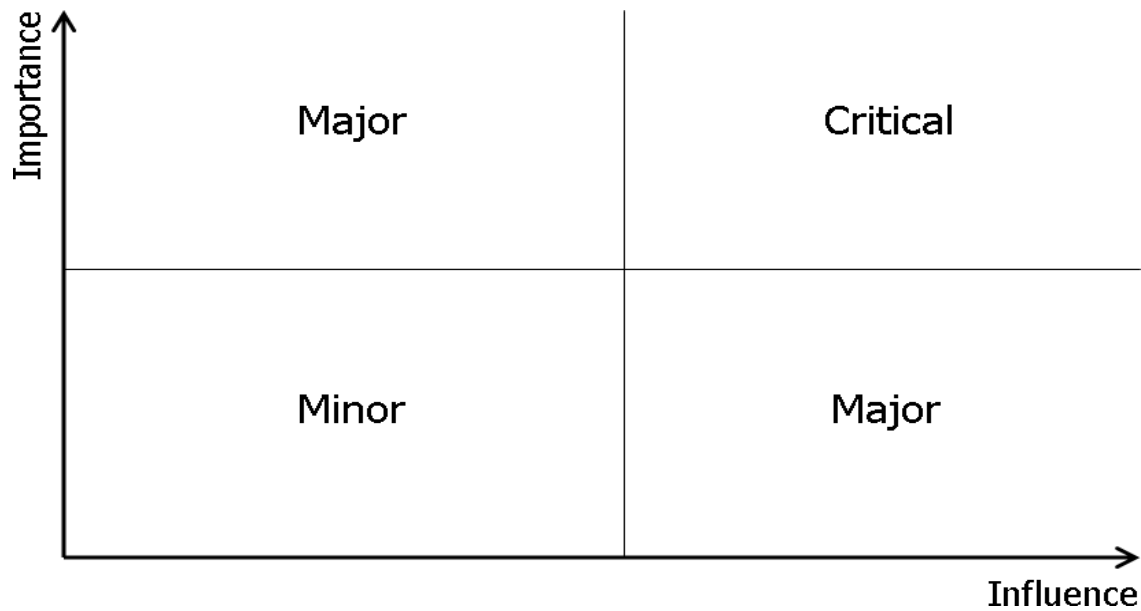


Figure 1:Stakeholders Priority Determination Graph

The above graph classifies the stakeholders on the basis of their influence and importance (considering both at a time) towards the functioning of the system.

In the above graph the stakeholders are prioritize based on two factors:

- **Influence:** It defines how the presence/absence of the stakeholders could affect the system or can be effected by the system
- **Importance:** It can be defined as how the presence/absence would affect the performance of the system. It in unidirectional

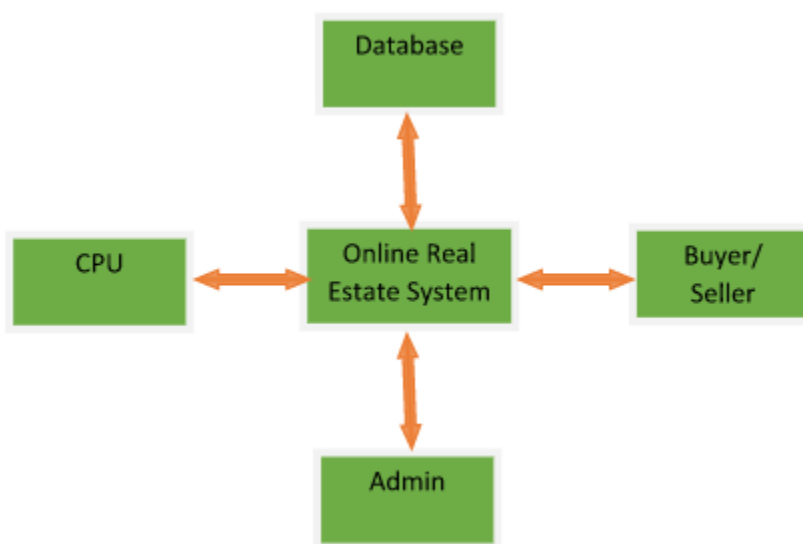
Based on these factors, the stakeholders are categorized as:

1. **Critical:** The Stakeholders with High Influence and High Importance. Following are the stakeholders which follow under this category:
 - **Administrator:** Responsible for managing the advertisements, registering and de-registering users, assigning privileges to users, listing of all the buyers and sellers, security of the system.
2. **Major - High Importance and high influence:** The Stakeholder with High Importance but high Influence. Following are the stakeholders which follow under this category:
 - **Buyer:** Responsible for payment of the selected property they want to buy.

- Seller: Responsible for the advertisement they are posting about their properties and responsible for edit, update or delete that advertisement.
3. **Minor:** The stakeholders with low Importance and low Influence. Following are the stakeholders which follow under this category:
- **Guest viewer:** Guest viewer can be any person who can visit the online real-estate system and view properties.

3. Software Design and architecture

3.1 Overview



The Online real estate system is available 24*7 where sellers and buyers come together on one platform to either sell or buy properties. It works like a perfect middle place for customers to get what they want by just browsing through the listings. They get to refine their search accordingly. The buyer as well as the seller needs to register and log in order to make an offer or post an advertisement. They can communicate through messages. The transaction is secure because there is no payment done on the system since the property value can be negotiated if the seller allows it. The system gets connected to the database in order to retrieve the user's information as well the properties which they choose. The user can message the administrator which will be stored in the database and can be retrieved by the administrator himself.

4. Use Case Diagram of Online Real Estate System

Use Case ID:	UC1
Use Case Name:	User Registration
Actors:	User(Buyer /Seller)
Description:	Allows the user to register on the site in order to post or buy properties.
Preconditions:	The user wants to either post or advertise his/ her property or wants to view, buy or make an offer on any property.
Post-conditions:	User now has access to advertise his/ her property. User can now enter search criteria and buy a property.
Normal Flow:	User enters the online Real- estate system. User selects Register option. User is asked to enter his details- Name, Email id, Phone number. After the user enters his details and clicks Done, he/she is registered in the system.
Exception Flow:	User enter invalid Email id: User is prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 2: Login

Use Case ID:	UC2
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Use Case Name:	Login
Actors:	User(Admin/Buyer/Seller)
Description:	Allows the user to login on the site with valid Credentials.
Preconditions:	The user should be registered and already have an account with login credentials.
Post-conditions:	NA
Normal Flow:	<ol style="list-style-type: none"> 1. User enters the online Real- estate system. 2. User selects “Login” option. 3. User is asked to enter his details- Username and Password and click “Login” button. 4. The system validates the account credentials. 5. If the credentials are correct: System allows user to access system, if not; the system displays the appropriate message of failure.
Exception Flow:	If the User enters wrong username, User is prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 3: Forgot Password

Use Case ID:	UC3
Use Case Name:	Forgot Password
Actors:	User(Buyer /Seller), Admin
Description:	Allows the user to reset password in case he/she forgot the password

Preconditions:	The user should have username.
Post-conditions:	User now have an access to the system.
Normal Flow:	<ol style="list-style-type: none"> 1. User enters the online Real- estate system. 2. User selects “Login” option 3. User forgot the password for Login. 4. User has to click on “Forgot Password” link. 5. The system will redirect the user to Password Reset page ask for user details for verification. 6. If user is verified, then system helps user to reset the password. 7. If the user is not verified, system displays the appropriate message.
Exception Flow:	<p>User enter invalid Username:</p> <p>User is prompted to enter a valid Username in order to proceed further.</p>
Priority:	High
Frequency of Use:	High

Use Case4: Change password

Use Case ID:	UC4
Use Case Name:	Change Password
Actors:	User(Buyer/Seller/Admin)
Description:	Allows the user to update his/her password if required.
Preconditions:	The user should have username and current password.
Post-conditions:	User now have a new password to access to the system.
Normal Flow:	<p>User enters the online Real- estate system.</p> <p>User selects “Login” option</p>

	<p>User enters account credentials for Login</p> <p>User has to click on “Change Password” link.</p> <p>The system will redirect the user to Password Updation page and ask for username current password and new password to update.</p> <p>If user is verified, then system helps user to update his/her password.</p> <p>If the user is not verified, system displays the appropriate message.</p>
Exception Flow:	<p>User enter invalid Username/Password:</p> <p>User is prompted to enter a valid Username/ Password in order to proceed further.</p>
Priority:	High
Frequency of Use:	High

Use Case 5 : Edit/Update Profile

Use Case ID	UC5
Use Case Name	Edit/Update Profile
Primary Actor	Users (Buyers/Sellers/Admin)
Description	User can update their own profile information
Pre-Conditions	User should be registered and should have access to System with account credentials.
Post Conditions	It is must to commit update after profile editing.
Normal Flow	<ol style="list-style-type: none"> 1. User has to login into the system using valid username and password.

	<ol style="list-style-type: none"> 2. User can edit his/her profile by clicking on 'Update Profile'. 3. Some of the details can be editable but some of them require admin intervention and thus shown as grayed out. 4. User can edit the profile. 5. System displays the appropriate message on successful update or failure.
Priority	Medium
Frequency of Use:	Low

Use case 6: Delete Profile

Use Case ID	UC6
Use Case Name	Delete Profile
Actor	User (Buyer, Seller)
Description	User can delete their own account by deleting their account profile
Pre-Conditions	User should have access to System with account credentials and access to profile.
Post Conditions	One's profile is deleted, user won't have access to system afterwards.
Normal Flow	<ol style="list-style-type: none"> 1. User has to login into the system using valid username and password. 2. User can delete their profile by clicking on 'Delete Profile/Account' tab. 3. System will ask for the confirmation to delete the account. 4. User has to confirm. <p>System displays the appropriate message on successful Account deletion.</p>
Priority	Medium
Frequency of Use:	Low

Use Case7: Search/View Property

Use Case ID	UC7
Use Case Name	Search/View Property
Actor	User (Buyers, Sellers, Guest Viewer)
Description	The customer can Search/View the property based on Region or some other criteria (such as Category and Price) or customer can view all the posts without any search criteria.
Pre-Conditions	User should have user account on System.
Post Conditions	NA
Normal Flow	<ol style="list-style-type: none"> 1. Customer logged in successfully on System. 2. Customer can search property based on the Region, or Category or price listed for property advertisement posted. 3. Customer can view all the Properties posted without any search criteria. 4. System will display the property advertisements based on the search criteria or all posts depending on the customer's action in Step 3 or Step 4.
Priority	High
Frequency of Use:	High

Use Case 8: Send Message Feedback

Use Case ID	UC8
Use Case Name	Send message or feedback.
Actor	User (Buyer, Seller, Admin)
Description	Users can send text message to each other internally for any query/negotiation or can send feedback regarding user experience or can ask technical queries if any to Admin.
Pre-Conditions	Users should have RESS user account.

Post Conditions	NA
Normal Flow	<ol style="list-style-type: none"> 1. User has to login into the system using valid username and password. 2. User has to click on 'Send message/Feedback' tab. 3. User typed in the text message to be send having specific character limit and click 'Submit' to send the message or feedback.
Priority	Medium
Frequency of Use:	Medium

Use Case 9: manage privileges

Use Case ID	UC9
Use Case Name	Manage Privileges
Primary Actor	Admin
Secondary Actor	User(Buyer, Seller)
Description	Admin can provide Seller or Buyers privileges to user based on the request made by user. User can own either one of the role or both the roles.
Pre-Conditions	User should have registered for the account with role requirement information.
Post Conditions	User should have access to the system based on the specific role chosen (Buyer or Seller or Both)
Normal Flow	<ol style="list-style-type: none"> 1. User has to register for the account 2. User will provide role (seller, buyer) requirement. 3. Admin/System has to check the role field of the registration form. 4. Admin/System will provide privileges based on the role. 5. User will be notified with the type of account (seller, buyer) created successfully.
Priority	High
Frequency of Use:	High

Use Case 10: Add User

Use Case ID:	UC10
Use Case Name:	Add User
Actors:	Admin
Description:	Admin can approve or reject the request of user to create an account
Preconditions:	The user should have submitted a duly filled application form
Post-conditions:	The user will be able to login and do business through system.
Normal Flow	<ol style="list-style-type: none">1. Admin enters the online Real- estate system.2. Admin selects “Login” option.3. Admin is asked to enter his details- Username and Password and click “Login” button.4. Admin views the list of applicants5. Admin Approves the request after viewing the Account details
Exception Flow:	If the Admin enters wrong username, Admin is prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 11: Delete User

Use Case ID:	UC11
Use Case Name:	Delete User
Actors:	Admin
Description:	Admin deletes the account if the user has violated policies of system

Preconditions:	The user should have committed some malicious activity
Post-conditions:	The user will no longer be able to login and do business through system.
Normal Flow	<ol style="list-style-type: none"> 1. Admin enters the online Real- estate system. 2. Admin selects "Login" option. 3. Admin is asked to enter his details- Username and Password and click "Login" button. 4. Admin views the list of users 5. Admin selects specific account which is to be deleted from the system
Exception Flow:	If the Admin enters wrong username, Admin is prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 12: View User

Use Case ID:	UC12
Use Case Name:	View User
Actors:	Admin
Description:	Admin views the list of users
Preconditions:	There must be some existing users in the system
Post-conditions:	T
Normal Flow	<ol style="list-style-type: none"> 1. Admin enters the online Real- estate system. 2. Admin selects "Login" option. 3. Admin is asked to enter his details- Username and Password and click "Login" button. 4. Admin views the list of users

Exception Flow:	If the Admin enters wrong username, Admin is prompted to enter a valid Email id in order to proceed further.
Priority:	Low
Frequency of Use:	Low

Use Case 13: Add Property

Use Case ID:	UC13
Use Case Name:	Add Property
Actors:	Seller
Description:	Seller create a post of particular property.
Preconditions:	The Seller should have successfully logged in the system
Post-conditions:	The buyer and guest will be able to see the advertisement.
Normal Flow	<ol style="list-style-type: none"> 1. Seller enters the online Real- estate system. 2. Seller selects "Login" option. 3. Seller is asked to enter his details- Username and Password and click "Login" button. 4. Seller selects create an advertisement 5. Seller adds description and price of property 6. Seller clicks on "publish" button
Exception Flow:	If the Seller enters wrong username, seller is prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 14: Send Message

Use Case ID:	UC14
Use Case Name:	Send Messages
Actors:	(User)Buyer, Seller
Description:	The actors communicate between each other by Sending messages
Preconditions:	The user must be logged in as Buyer or Seller
Post-conditions:	The users will be able to communicate between each other by Sending messages
Normal Flow	<ol style="list-style-type: none">1. Buyer, Seller enters the online Real- estate system.2. Selects "Login" option.3. They are asked to enter their details- Username and Password and click "Login" button.4. They are prompted to Enquiry option from where they can Send Messages to each other.
Exception Flow:	If they enter wrong credentials, they are prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 15: Receive Messages

Use Case ID:	UC15
Use Case Name:	Receive Messages
Actors:	Buyer, Seller
Description:	The actor Receives the messages send by other actor.
Preconditions:	The user must be logged in as Buyer or Seller

Post-conditions:	The user will be able to receive messages send by other user.
Normal Flow	<ol style="list-style-type: none"> 1. Buyer, Seller enters the online Real- estate system. 2. Selects “Login” option. 3. They are asked to enter their details- Username and Password and click “Login” button. 4. They are prompted to Enquiry option from where they can read Messages intended to them by other user.
Exception Flow:	If they enter wrong credentials, they are prompted to enter a valid Email id in order to proceed further.
Priority:	High
Frequency of Use:	High

Use Case 16: Search Property

Use Case ID:	UC16
Use Case Name:	Search property
Actors:	User (Buyer, Guest viewer)
Description:	Any user can search for properties on the online real-estate system.
Preconditions:	<p>User is online on the real-estate system.</p> <p>User enters valid searching criteria.</p>
Post-conditions:	Properties based on the search criteria are displayed (if applicable).
Normal Flow:	<ol style="list-style-type: none"> 1. User enters the online real-estate system. 2. User specifies search criteria such as location, size, and prize of the properties he/she is interested in.

	<ol style="list-style-type: none"> 3. User has the option to include or exclude facilities around the property such as schools, hospitals, etc. 4. Properties according to the criteria (if applicable) are displayed.
Exception Flow:	Display page is empty. If user inputs invalid searching criteria, then system will not display any results.
Priority:	High
Frequency of Use:	High

Use Case 17: View Property

Use Case ID:	UC17
Use Case Name:	View property
Actors:	User (Buyer, seller, Guest viewer)
Description:	Any user can view particular properties details on the online real-estate system.
Preconditions:	User is online on the real-estate system.
Post-conditions:	Selected property is displayed.
Normal Flow:	<ol style="list-style-type: none"> 1. User enters the online real-estate system. 2. User specifies searching criteria or can choose from displayed results of property. 3. User chooses a particular property to view details. 4. Selected property is displayed.
Exception Flow:	
Priority:	High
Frequency of Use:	High

Use Case 18: Buy Property

Use Case ID:	UC18
Use Case Name:	Buy property
Actors:	Users(Buyers)
Description:	User wants to buy the property he/she is interested in the online real-estate system.
Preconditions:	User is registered in the online real-estate system.
Post-conditions:	User holds the property which he/she is interested in.
Normal Flow:	<p>er logs into the system.</p> <p>er searches and navigates through the properties.</p> <p>er selects the one he/she is interested in.</p> <p>er proposes to buy the property and confirms it.</p>
Exception Flow:	<p>User who is not registered tries to buy a property</p> <p>The user is prompted to register and log into the system in order to buy the property.</p>
Priority:	High
Frequency of Use:	Medium

Use Case 19: Logout

Use Case ID	UC19
Use Case Name	Logout
Actor	User (Buyer/Seller/admin)

Description	Helps user to logout from System.
Pre-Conditions	User should be Logged In to System.
Post Conditions	User needs to login again to the system ones logout.
Normal Flow	<ol style="list-style-type: none"> 1. User has already logged in on System 2. User completes his/her task and want to logout. 3. User has to click on 'Logout' button. 4. System displays the appropriate message stating confirmation that user has been logged out successfully.
Exception Flow:	NA
Priority	High
Frequency of Use:	High

5.Functional Requirements

Priority	Requirement Title	Description
High	Home Page	1) Home page should be accessible to any user. 2) Home page should have Login Username and password field to login. 3) Home page should have Signup button for registration.
High	Login	1) For one user the login-state can be either logged in or not logged on. 2) The system shall store the login-state in a server session. 3) The user can only login after the registration to the system. 4) The user should have access to Login page for system login. 5) The user should provide correct username and password to login 6) The system should prompt at the incorrect username and password. System should match the username and password from the database. 7) Ones user logged in, the system should display the real estate webpage.
High	Register	1) User should have access to the registration page without login upon clicking on 'signup' button. 2) System should prompt for the mandatory information before saving the user profile. 3) System should not let user submit the registration form with empty username and password fields. 4) Information provided by the user in the registration process should be inserted into the database. 5) System should confirm the username of the user though display message "Successful registration" 6) System should direct user to Login page after successful registration.
High	Forgot Password	1) System should ask for the username from the user. 2) System should verify the username from the database. 3) System should not let user to provide the new password, if username doesn't match with the database. 4) System should display the password reset page upon existing username in the database. 5) System should ask user to enter the new password twice to match the correctness.
High	Admin Manage Account	1) Admin should have access to view all user account in the system. 2) Admin should have access to delete any user account from the system 3) Admin should have access to add new account to the system.

High	User Manage Profile	1) Any user of the system having login access, should have access to manage their own user profile information. 2) System should provide access to the user to change the password. 3) System should provide edit option to edit/update the user profile. 4) System should allow user to delete his own profile. 5) System should prompt to save the edit information every time user make change(s) to profile data.
High	Change password	1) System should ask for the existing password along with the new password. 2) System should match the existing password from the data to verify the authenticity of the user. 3) System should replace the old password with the password provided by the user. 4) System should prompt if the existing password does not match with the given password by user. 5) System should not update the new password if old password doesn't match with the existing password in the database.
High	Access Privileges	1) System should assign the account privileges as per the data mentioned in the "User Role" field of the registration form. 2) If the "User Role" = 'Buyer', system should provide access to buy the property (Buy button should be visible to buyers) 3) If the "User Role"= ' Seller", the system should provide access to sell, add, update and delete property privileges. (sell, view, update, add and delete button should be visible to seller)
Medium	Communication messages	1) System should allow user to enter Text message within 250 characters. 2) System should prompt user upon successful message sent to recipient. 3) System should prompt to enter receipt information if missing and should not allow to send the message. 2) System should display the message to the recipient selected by the user. 3) System should prompt user is in case of increase in text message character limit.
Low	Guest Viewer functionalities	1) System should allow guest user to view all the properties listed without login on to the system. 2) There should not be any other access to the user on the system except view property listings. 3) There should be signup button available to the guest user.
Medium	Other functionalities	1) Password should be in encrypted format in the database.
High	Logout	1) Upon clicking to the "Logout" Button, the user will not be able to access the system except the viewing function. The "Logout" button should be available to every webpage of the system.

Table 2: Functional Requirement

6.Non-Functional Requirements

Non-Functional Requirements	
Requirement Title	Description
Reliability	The Windows or Mac web-server should always be available no matter what time a user or Admin attempts to access the Online Real Estate System. Maintenance of 1 hour per six months is the maximum downtime the system should receive. The information processed by the Real Estate System must be validated on the server-side before being processed in order to ensure user input is not malicious. The database should maintain data normalization by implementing a primary and foreign key system so that discrepancies do not occur within the data.
Efficiency	Search queries or page loads should be returned and formatted by the MySQL parser in a timely fashion depending on the request being made
Maintainability	All Java pages used by the Real Estate web site will be centrally located within the file structure so that any update will affect all areas where the modified code is called. Administrators will have the ability to edit the aspects of the Real Estate System that directly relates to their account.
Usability	The Online Real-Estate System is a one place where number of Users can easily access to the system without prior knowledge of the system.
Portability	The Online Real-Estate system can be easily installed and run on different platform, for example it can easily run on Windows Operating System or Mac Operating System.
Security	User's passwords will be encrypted within the database. Pages of the Real Estate System must be access in the way they were intended to be accessed. Included files shall not be accessed outside of their parent file. The Admin can only perform administrative task on pages they are privileged to access. Users will not be allowed to access the control panel of administrative areas.

Table 3: Non-functional Requirement

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