Architecture Design

For Online Real Estate System

Version 1.0

Submitted in partial fulfillment of the requirements of the degree of MSE

Mosaad Alomery
CIS 895 – MSE Project
Kansas State University
# Table of contents

1. **Introduction** ........................................................................................................................................... 3

2. **Architecture of the ORES** ....................................................................................................................... 3

   2.1 **Application Tier** ................................................................................................................................. 4

   2.2 **Business Tier** ....................................................................................................................................... 4

      2.2.1 **Class Description** ....................................................................................................................... 6

         2.2.1.1 **USER** ...................................................................................................................................... 6

         2.2.1.2 **Manager** .................................................................................................................................. 6

         2.2.1.3 **Employee** ................................................................................................................................ 6

         2.2.1.4 **Customer** ............................................................................................................................... 7

         2.2.1.5 **Property** .................................................................................................................................. 7

         2.2.1.6 **House** ...................................................................................................................................... 7

         2.2.1.7 **Land** ...................................................................................................................................... 8

         2.2.1.8 **Apartment** .............................................................................................................................. 8

   2.2.2 **Sequence Diagram** .......................................................................................................................... 9

      2.2.2.1 **Login** ........................................................................................................................................ 9

      2.2.2.2 **Search Real Estate** .................................................................................................................... 9

      2.2.2.3 **Update Real Estate** .................................................................................................................. 10

2.3 **Data Tier** ............................................................................................................................................... 11

2.4 **Security** ............................................................................................................................................... 12
1. Introduction

The purpose of this document is to provide an architecture design for the Online Real Estate System. The design will show the application tier, the business tier, which consist of class and sequence diagrams with a short description about the purpose of each class, and the data tier.

2. Architecture of the ORES

The architecture of the ORES is based on a three logical tier architecture which are the application tier, the business tier, and the data tier.

The figure below shows the three-tier architecture for ORES:
2.1 Application Tier

The application tier for the Online Real Estate System is ASP.Net web forms with a user control. The Visual Web Developer will be used to create ASP.NET web forms which use code behind code where the code for each page is encapsulated into separate file.

The table below shows the ASP.Net web forms for Customer of ORES.

- Default.aspx: The index\welcome page.
- Search.aspx: The web page for searching a real estate.
- ContactUs.aspx: The page for contacting the Real Estate office and placing a request for a Real Estate.

The table below shows ASP.Net web forms for the Manager of ORES.

- Login.aspx: The page for login to secure web sites.
- CreateEmp.aspx: The page for creating\adding employees to the system.
- Location.aspx: The web page for adding locations to the system.

The table below shows ASP.Net web forms for the Employee of ORES.

- CreateNewReal.aspx: The page for creating a new real estate in the system.
- Update.aspx: The page for updating a property.

2.2 Business Tier

The business specific layer consists of eight classes: User, Manager, Employee, Customer, Property, House, Land, and Apartment.

The diagram below captures the domain model of the Online Real Estate System.
2.2.1 Class Description

2.2.1.1 USER

```
USER
- UserName : string
- Password : string
+ VerifyLogin()
+ Logout()
```

This class will handle all user actions. The User class is the abstract class of Manager and Employee. The User class has private method to verify login, and logout. The verify login is called when the user presses the login button on the Sign In page. It returns true if the login is successful and false otherwise. The logout method is called when the user clicks the logout link which is available when the user is logged in.

2.2.1.2 Manager

```
Manager
+ CreateEmployee()
+ MaintainLocation()
```

This class will handle the Manager actions. It inherits User class responsibilities and its functions. It has two functions. Create Employee to create a new employee in the system; Maintain Location to maintain the real estate locations in the system.

2.2.1.3 Employee

```
Employee
+ CreateNewRealEstate()
```

This class will handle the Employee actions. It inherits the User class tasks and its functions. It has a function CreateNewRealEstate to add a new real estate in the system.
2.2.1.4 Customer

<table>
<thead>
<tr>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Full Name : string</td>
</tr>
<tr>
<td>- Email : string</td>
</tr>
<tr>
<td>- Phone : int</td>
</tr>
<tr>
<td>- Address : string</td>
</tr>
<tr>
<td>+ Search()</td>
</tr>
<tr>
<td>+ Request()</td>
</tr>
</tbody>
</table>

The customer class is used to define the attributes of the customer. The customer has methods to search a real estate and make a request for a real estate. The Search method is called when the customer presses the Search button in the Search form page. The Request method is called when the customer clicks the make a request button on the Contact us page.

2.2.1.5 Property

<table>
<thead>
<tr>
<th>Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Price : double</td>
</tr>
<tr>
<td>- BPrice : double</td>
</tr>
<tr>
<td>- City : string</td>
</tr>
<tr>
<td>- Status : string</td>
</tr>
<tr>
<td>- ID : int</td>
</tr>
<tr>
<td>- Quarter : string</td>
</tr>
<tr>
<td>- Region : string</td>
</tr>
<tr>
<td>- Street : string</td>
</tr>
<tr>
<td>+ UpdateProperty()</td>
</tr>
<tr>
<td>+ FindProperty()</td>
</tr>
</tbody>
</table>

This class represents Property. The property has methods for updating property, and finding property in the system. The Update Property is called when the Employee clicks on the Update Real Estate web form. It returns true if the updating is saved in the system and false if not. Find property method is called when the Customer Searches for a property in the Search page.

2.2.1.6 House
This House class inherits the Property class responsibilities. Also, it has attributes for the site of the house and the room number in the house.

2.2.1.7 Land

The Land class inherits the Property class responsibilities with an addition attribute for the Size of the Land.

2.2.1.8 Apartment

This class represents Apartment. It inherits the Property class responsibilities. The Apartment class has attributes for providing information about whether the apartment has air-condition or not, the number of bathroom, bedroom, and finally an attribute specifying if the apartment is furnished.
2.2.2 Sequence Diagram

2.2.2.1 Login

The User needs to login to the system for accessing the sites that are secured. The user will enter the user name and password then press the login button on the login page. The User class will validate the user name and password. If they are correct, the system will open the admin page for the user. Otherwise, the system will ask the user to check his user name and password.

2.2.2.2 Search Real Estate
The sequence diagram presents a customer that successfully has searched a property in the system. The user will select category from the category search options on the Search web page. Then the customer will click the search button. The system then sends a find property message to Property which passes it as a query to the database to find the property being searched. If the result is not null, it will be displayed on the same web page. If not, the system will display an appropriate message to the user.

2.2.2.3 Update Real Estate
The sequence diagram shows successfully updating the Property information by the Employee. The Employee is already logged in to the system.

2.3 Data Tier

The database of the Online Real Estate System has the following structure of tables:

- **User**: Represents the User information.
- **Property**: Represents the Property information.
- **Customer**: Represents the Customer information.
- **City**: Represents the City information.

The complete physical database schema for the Online Real Estate System is illustrated in the database diagram below.
2.4 Security

The Online Real Estate System uses ASP.NET forms authentication to allow users to access secure web sites such as editing property information.