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(RADCON)

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Third Achievement Report

For

The Marketing Information Module

Submitted by

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Section 1. Introduction

1.1 Purpose

Purpose this design document is to describe the design and the architecture of *the marketing Information module (MIM)*. The design is expressed in sufficient detail so as to enable all the document users to understand the underlying architecture of *the MIM*.

1.2 Target Audience

This Design document is intended to act as a technical reference for developers involved in the development of *the MIM* in the RADCON project. This document assumes that the user has sufficient understanding of the following concepts:

- ✚ Classes and Interfaces.
- ✚ MS SQL2000.
- ✚ ASP.Net.

Note: This Design Document is not intended for *the MIM* end-users.

1.3 General Inputs/Outputs MIM

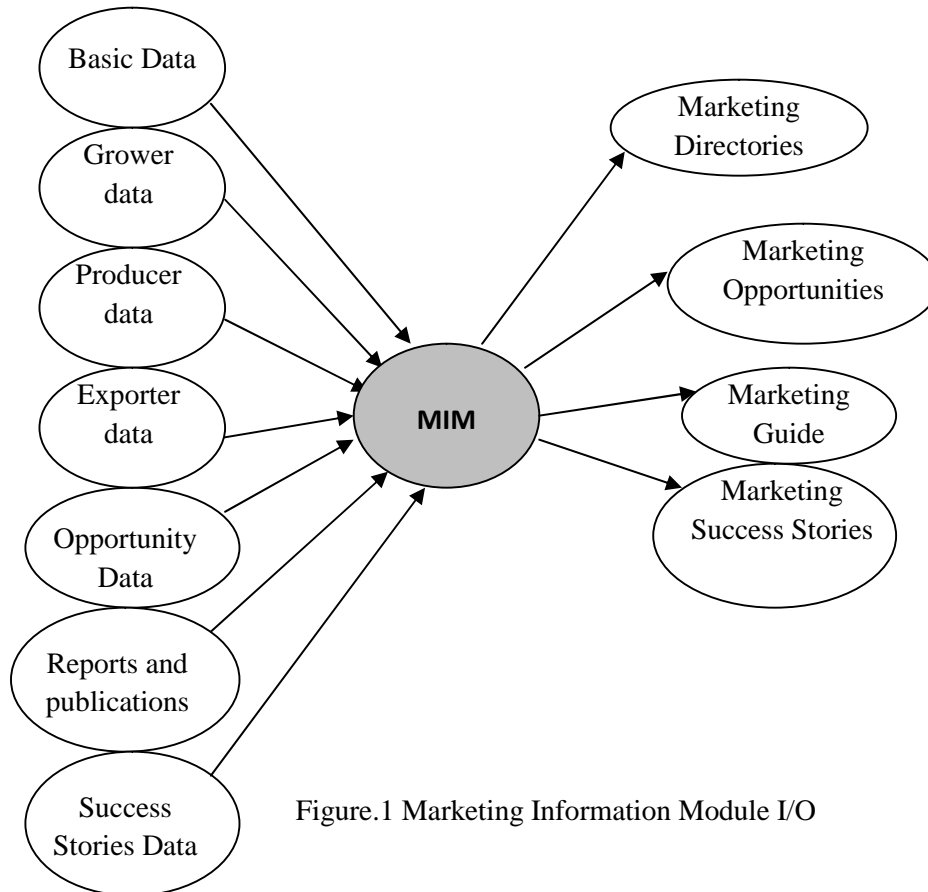


Figure.1 Marketing Information Module I/O

Inputs for these modules are all needed information from each sub-module, figure1 represents the input data. The input data for marketing directories are can be classified in to three categories that are profile, activities and contact information. Input data for the marketing opportunities are type, title, description, posting and expire date, quantity, rules, conditions and information about the opportunity owner. The input data for the marketing guider are meta data about the publication (type, language, title, description, uploaded file (html, pdf, text, word, etc...)). Finally, the input data for marketing success stories input data is story (title, author, description, time and place, problem effects, solution methodology, success reasons, solution effects) and with capability of upload images or files.

Section 2. MIM Components and Architecture

This section describes MIM components and their integration, users for each component and capabilities for each user. As shown in figure4, the proposed system consists of two components: front-end and back-end.

The backend component provides the data management functionalities that enable data entries and administrators to *new/update/delete/publish* data items into the MIM. This component provides the MIM data security, that for each administrator there is a specific username and password which associated with a specific capability.

The front end component provides the information retrieval/browsing/accessing functionalities, and is available for any site user. Also, it provides information monitoring functionality for only the MIM.

2.1. Physical Architecture

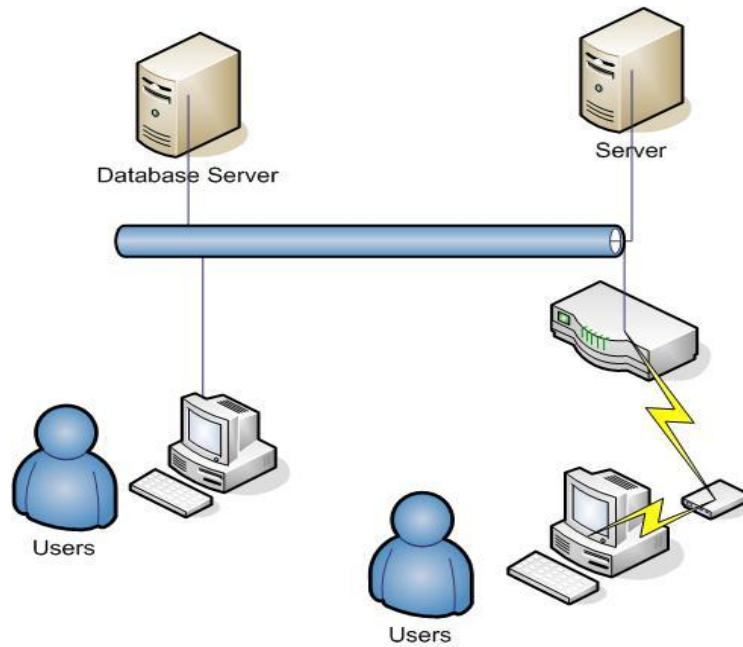


Figure 2. System Physical Architecture

2.2. High Level Logical Architecture

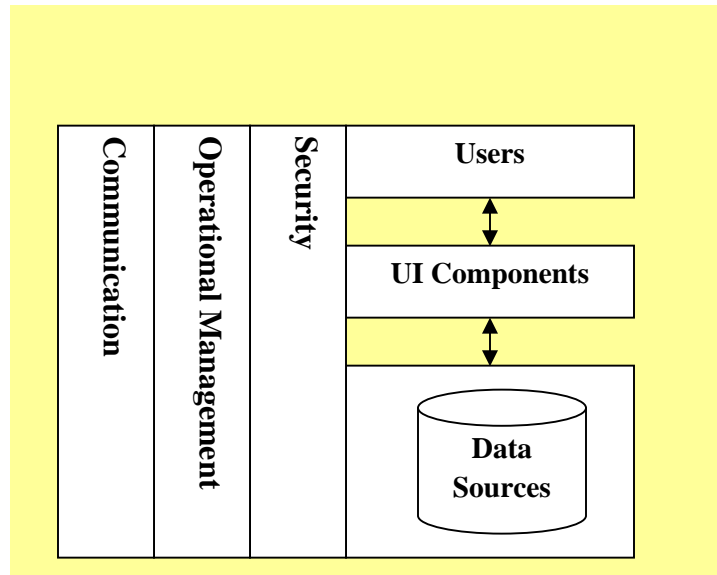


Figure 3. High Level Logical Architecture

2.3. Class Diagram for All Marketing Sub-Modules

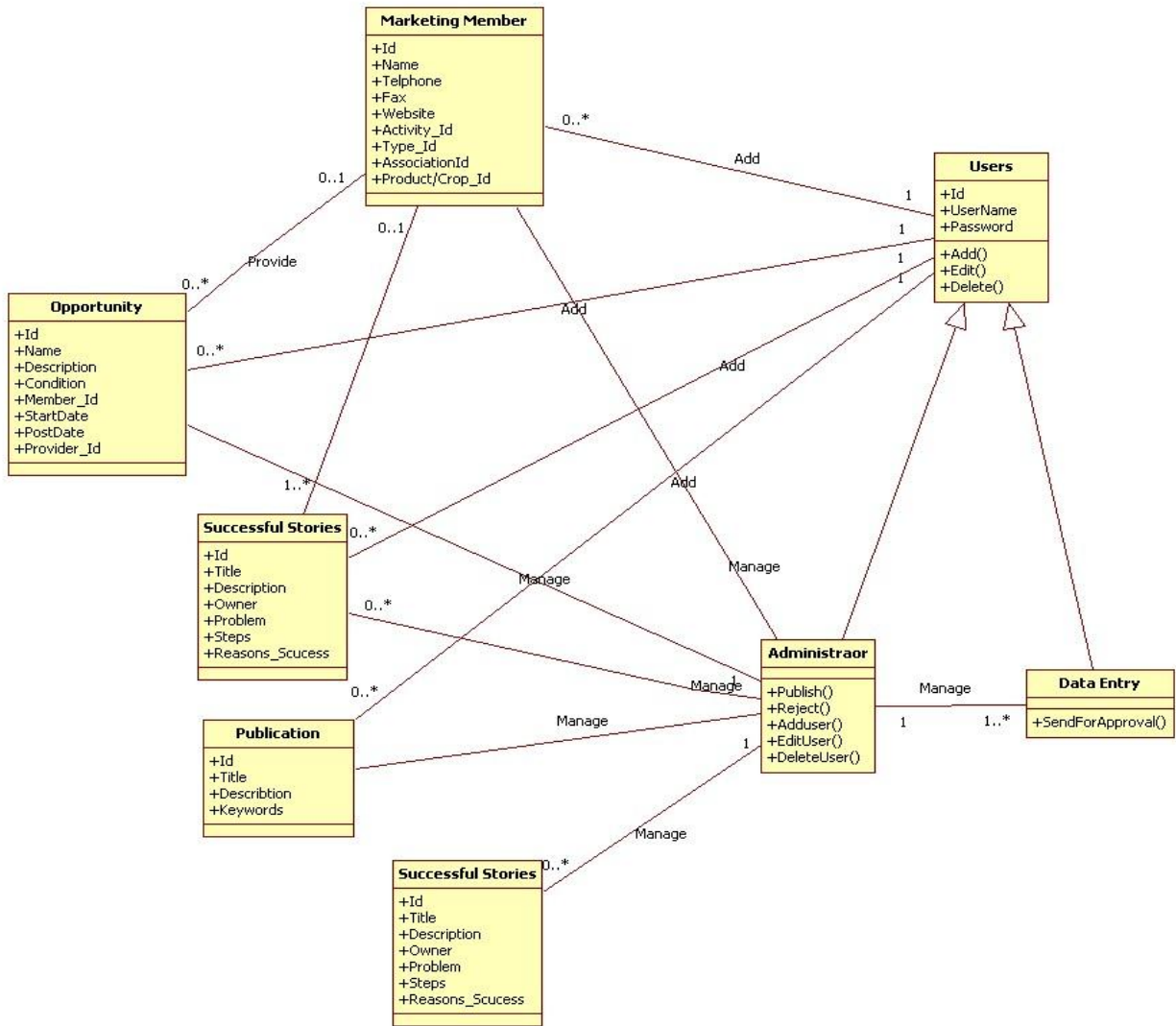


Figure 4. Class Diagram for Marketing Module

2.4. System State & Configurations

```
<connectionStrings>
```

```
  <add name="marketConnStr" connectionString="Data Source=192.168.1.40;Initial  
  Catalog=Market;User ID=Market;Password=markpass"  
  providerName="System.Data.SqlClient"/>
```

```
</connectionStrings>
```

```
<authentication mode="Forms">
```

```
  <forms loginUrl="bd/login.aspx" protection="All" timeout="60"  
  defaultUrl="bd/Aboutlist.aspx?cmd=resetall">
```

```
    <credentials passwordFormat="Clear" >
```

```
      <user name="admin" password="omran" /> </credentials> </forms></authentication>
```

Section3. Sub Modules:

3.1. Marketing Directories

3.1.1. Component Diagram for Marketing Directory

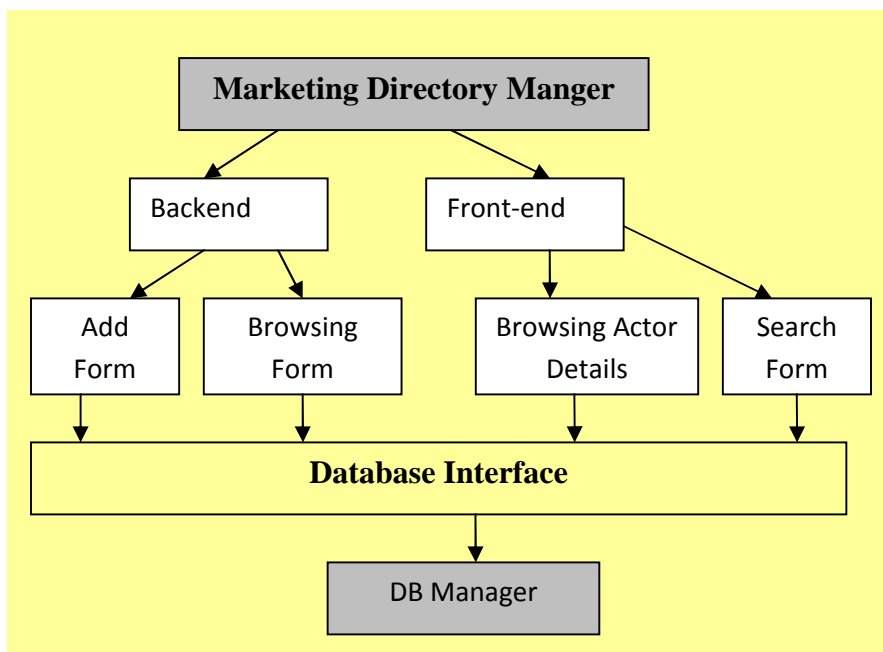


Figure 5. Structured Chart for Marketing Directory

3.1.2. Backend Portlets:

3.1.2.1. Add actor Portlet

Portlet Name	Add actor the marketing directories
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Actors, Group, Users, Product/Crop, Status
Source File(s)	ActorsActivites.aspx
Notes	

• Component Diagram for Adding Actor Form

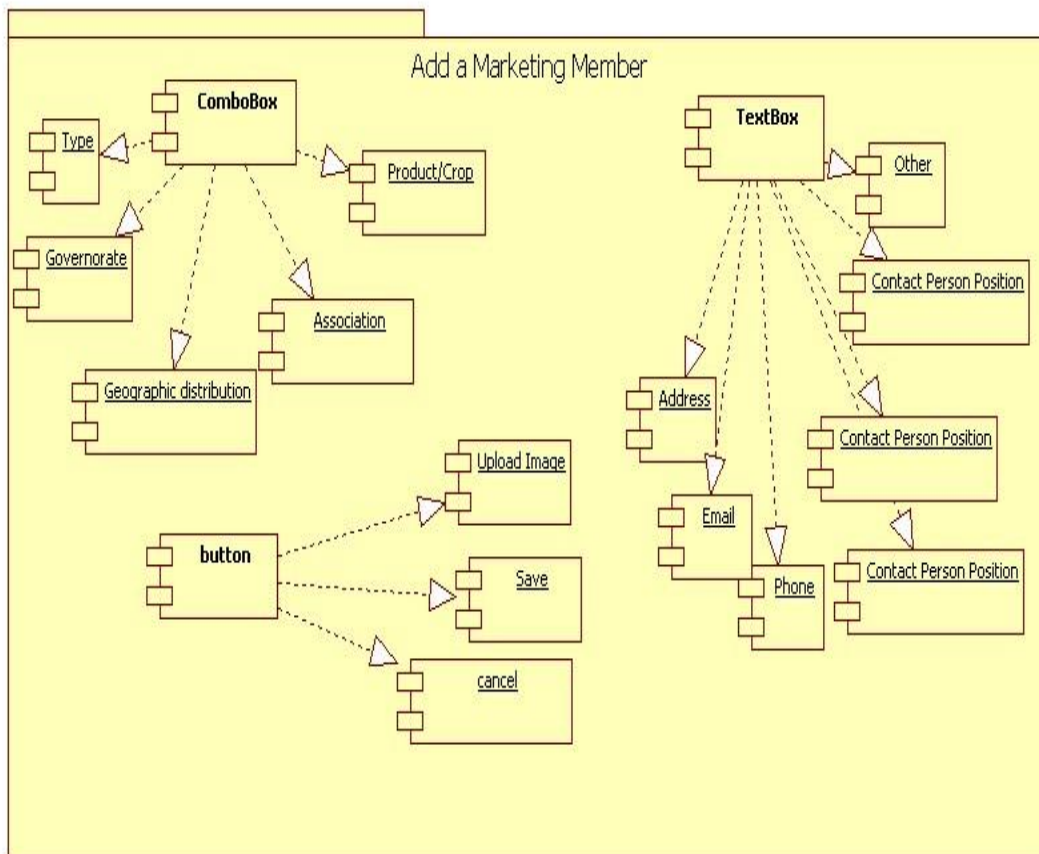


Figure 6. Component diagram for add actor form

• Sequence Diagram for Adding Actor form

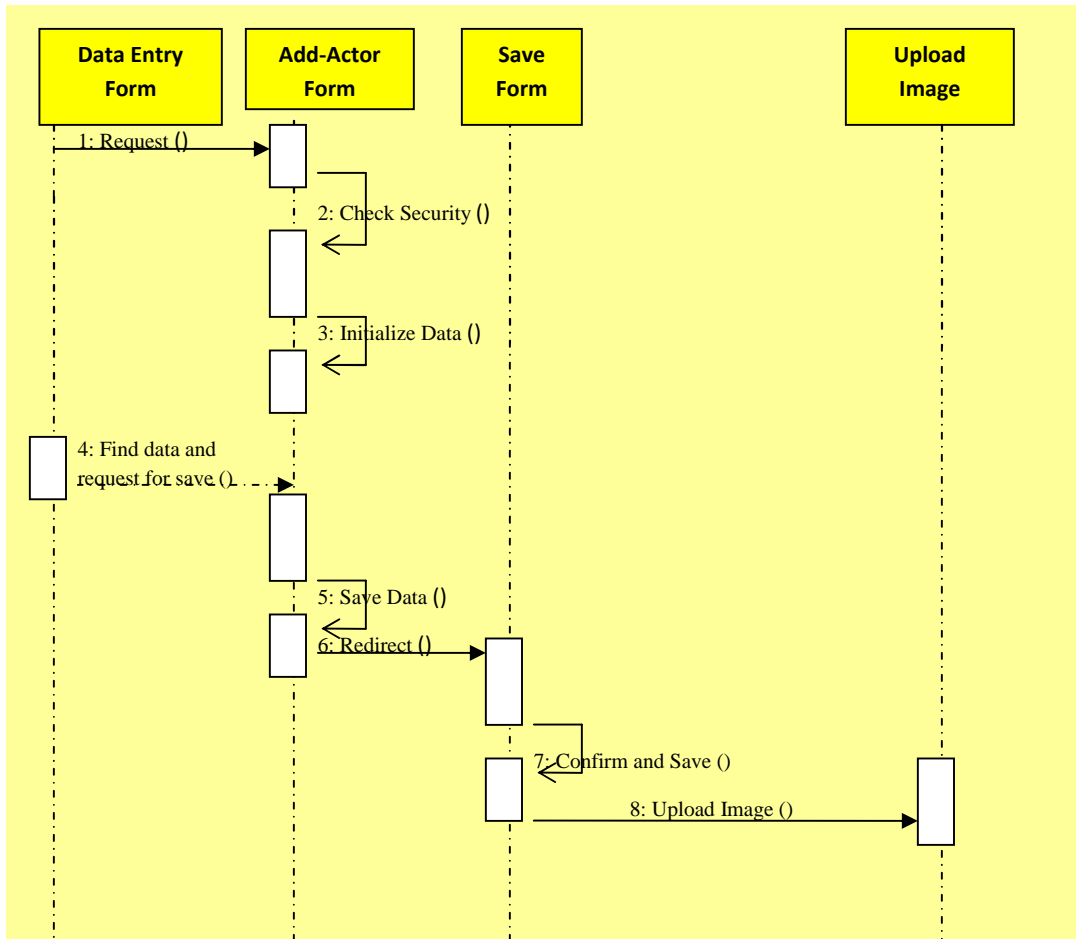


Figure 7. Sequence Diagram for Adding Actor to the Marketing Directory

3.1.2.2. Browsing Marketing Directory form Backend

Portlet Name	Browsing marketing directories
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Actors, Group, Users, Status
Source File(s)	actorlist.aspx
Notes	

• Component Diagram for Browsing Marketing Directory

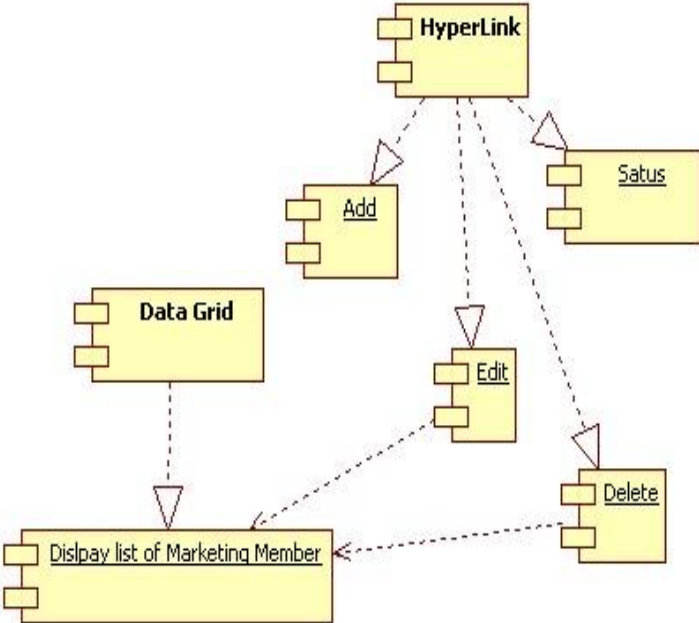


Figure 8. Browse Marketing Director at Backend

• **Sequence Diagram for Browsing Marketing Directory**

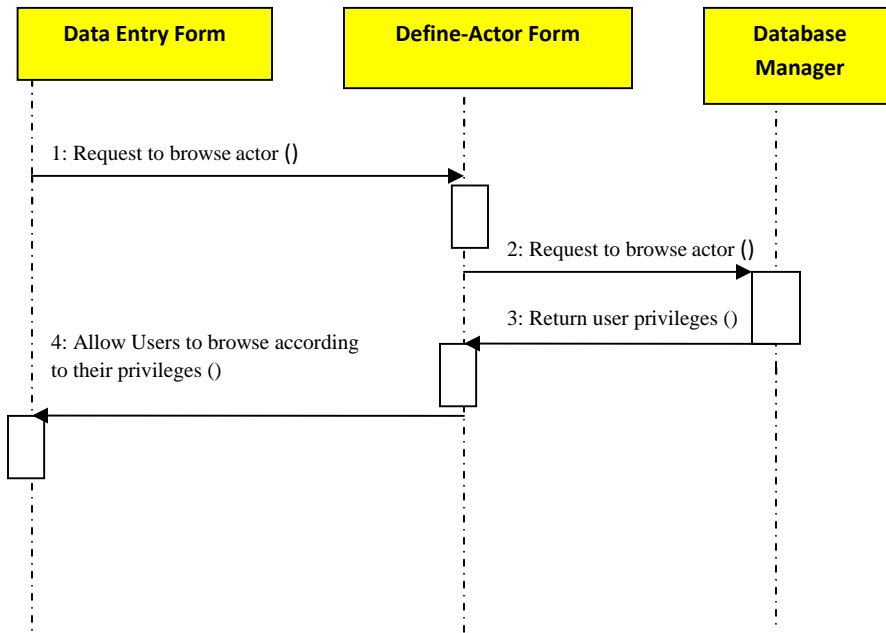


Figure 9. Sequence Diagram for Browsing Marketing Directory

3.1.3. Front-end Portlet:

3.1.3.1. Browsing marketing directory Form

Portlet Name	browse marketing directories
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes: Actors, Group, Users, Product/Crop, Status
Source File(s)	ActivityMember.aspx
Notes	Only the small enterprise that has been published will be displayed by this portlet

- **Component Diagram for Browsing Actor Details**

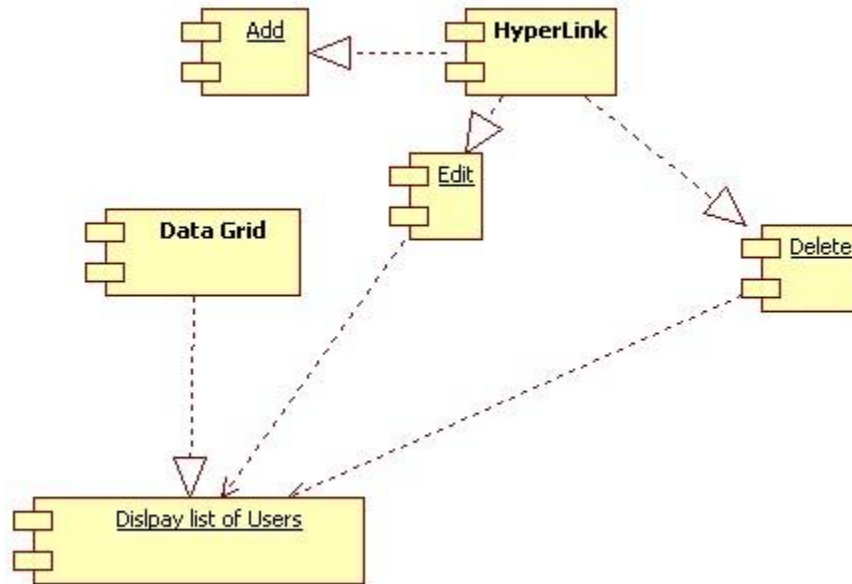


Figure 10 Component Diagram for Browsing Actor Form

- Sequence Diagram for Browsing Actor Form

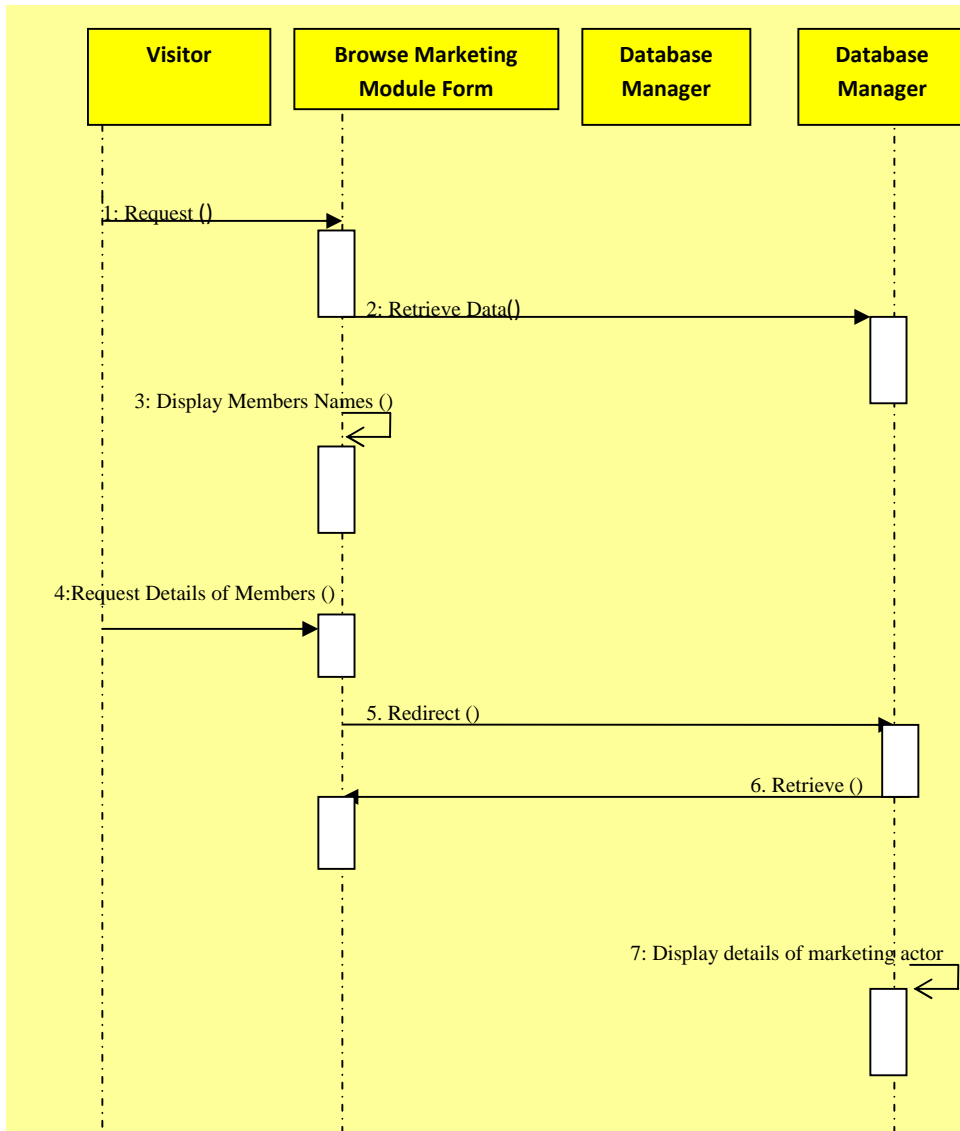


Figure 11. Sequence Diagram for Searching Actor to the Marketing Directory

3.1.3.2. Searching Marketing Directory Form

Portlet Name	searching Marketing Directory
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes: Actors, Group, Users, Product/Crop, Status
Source File(s)	ActivitySearch.aspx
Notes	Only the small enterprise that has been published will be displayed by this portlet.

• Components Diagram for Searching Actor Form

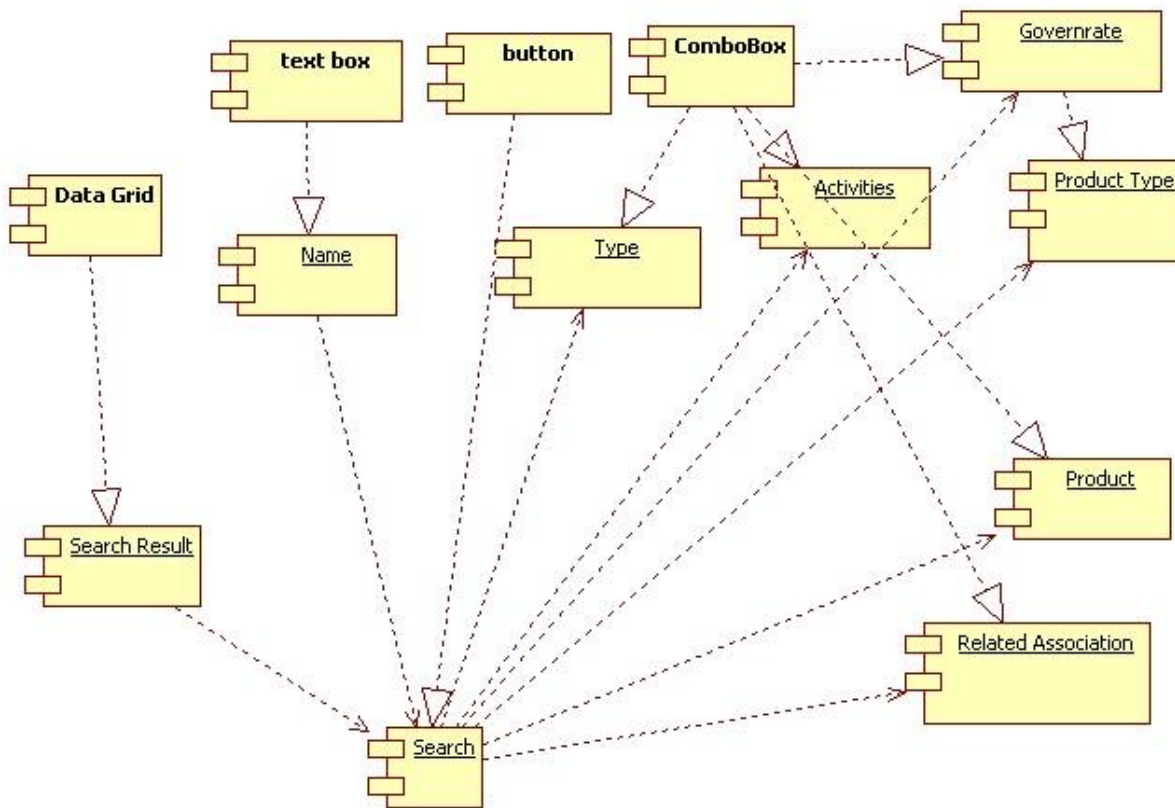


Figure12. Sequence Diagram for Searching Actor to the Marketing Directory

- Sequence Diagram for Searching Actor Form

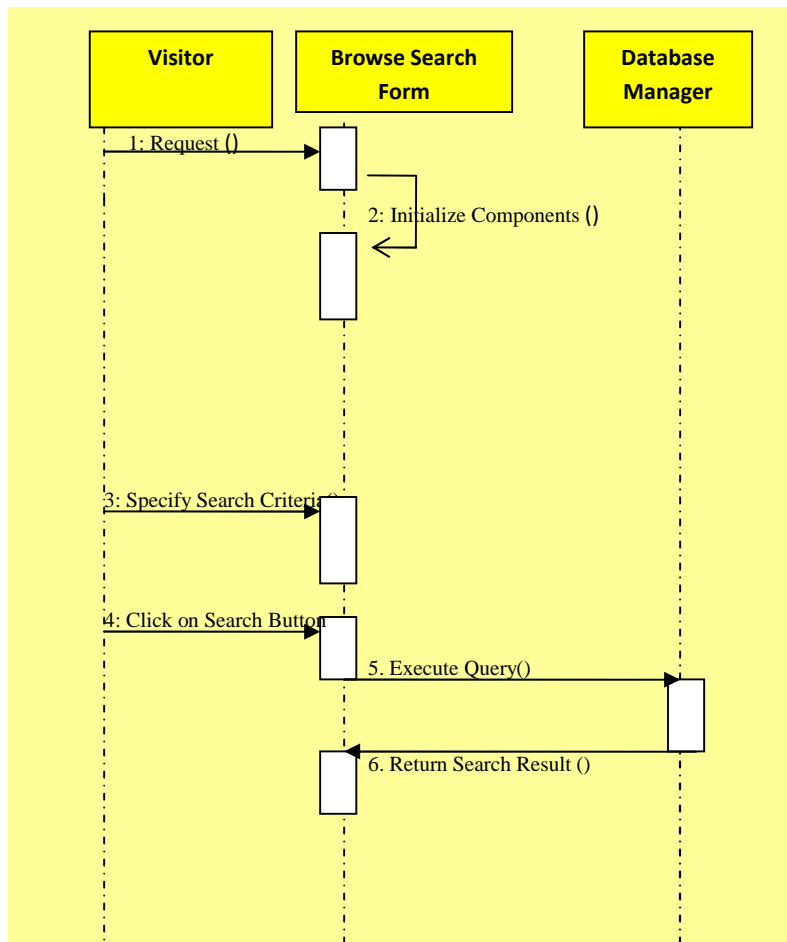


Figure 13. Sequence Diagram for Searching Actor to the Marketing Directory

3.1.4. ERD of all Marketing Director DB

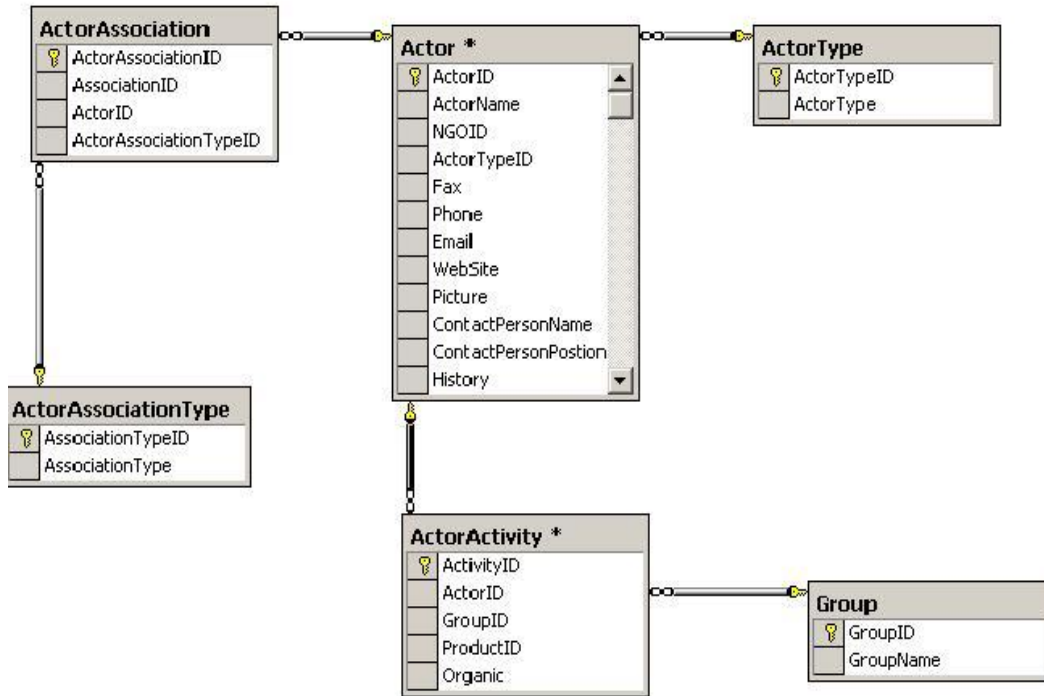


Figure 14. ERD of the Marketing Director

3.1.5. Related Tables Description

- **actortypelist.aspx Screen (Basic data Screen)**

<i>Table Name</i>	<i>ActorType Table</i>
<i>Description</i>	<i>Store basic data about module actors</i>

- **List of columns of the ActorType table**

<i>Name</i>	<i>Description</i>	<i>Type</i>	<i>Width</i>
ActorTypeID	Identity number for each actor type	smallint (pk)	2
ActorType	Describe actor type name	nvarchar	50

- **grouplist.aspx Screen**

<i>Table Name</i>	<i>Group Table</i>
<i>Description</i>	<i>Store basic data about activity type (growers, producers and exporters)</i>

- **List of columns of the Group table**

<i>Table Name</i>	<i>Description</i>	<i>Type</i>	<i>Width</i>
GroupID	Identity number for each group activity	smallint (pk)	2
GroupName	Describe group activity name	nvarchar	50

- **productInsert.aspx Screen (Basic data Screen)**

<i>Table Name</i>	<i>Product Table</i>
<i>Description</i>	<i>Store basic data about products and crops type.</i>

- **List of columns of the Product table**

<i>Name</i>	<i>Description</i>	<i>Type</i>	<i>Width</i>
ProductID	Identity number for each product	int (pk)	4
Product Parent ID	Identity number for each parent product	int (fk)	4
Product Name	Describe group product name	nvarchar	100

3.2. Marketing Opportunities

3.2.1. Component Diagram

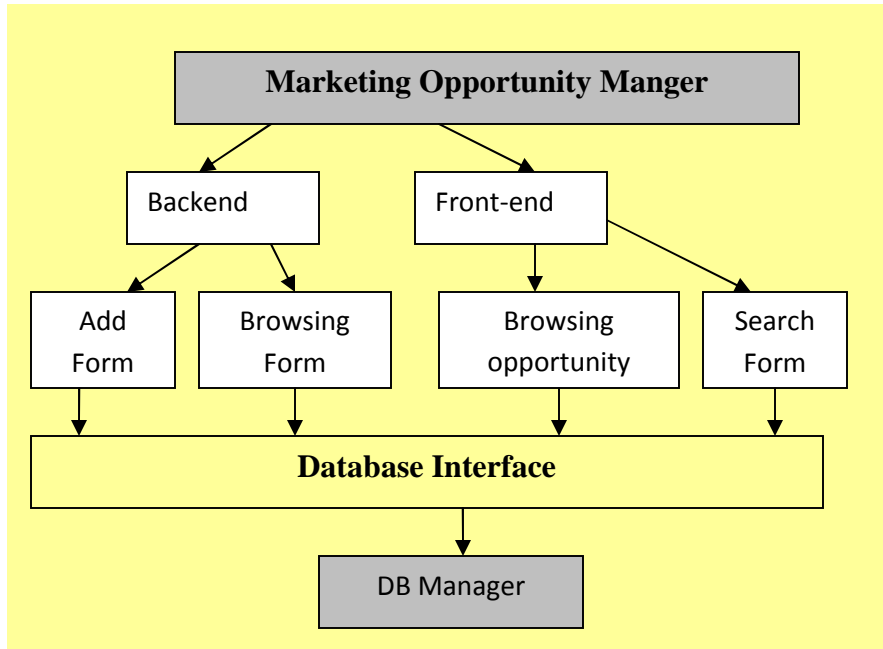


Figure 15. Structured Chart for Marketing Opportunities

3.2.2. Backend Portlets:

3.2.2.1. Opportunity Adding Portlet

Portlet Name	Add marketing opportunity
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Opportunity, Opportunity Type, Opportunity, Users, Actors, Status.
Source File(s)	OpportunityOfInternalActoradd.aspx
Notes	

• **Component Diagram for Adding Opportunity Form**

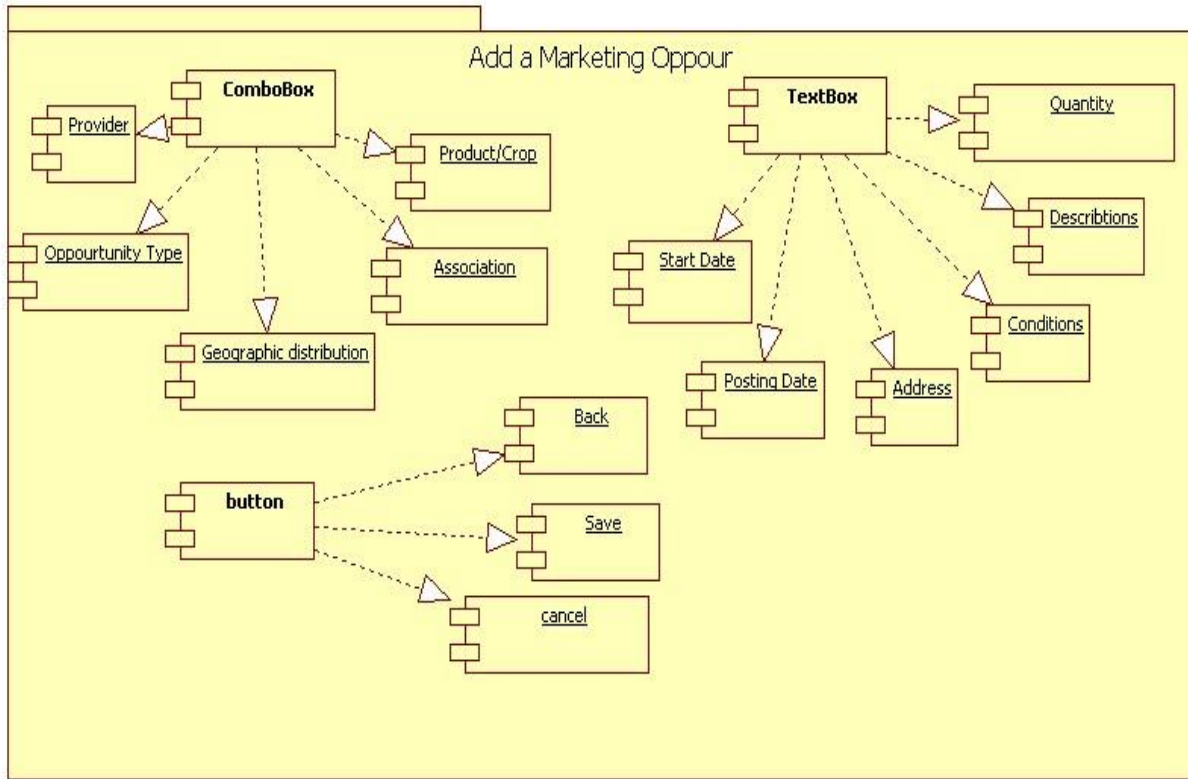


Figure 16. Component diagram for add opportunity form

• Sequence Diagram for Adding Opportunity form

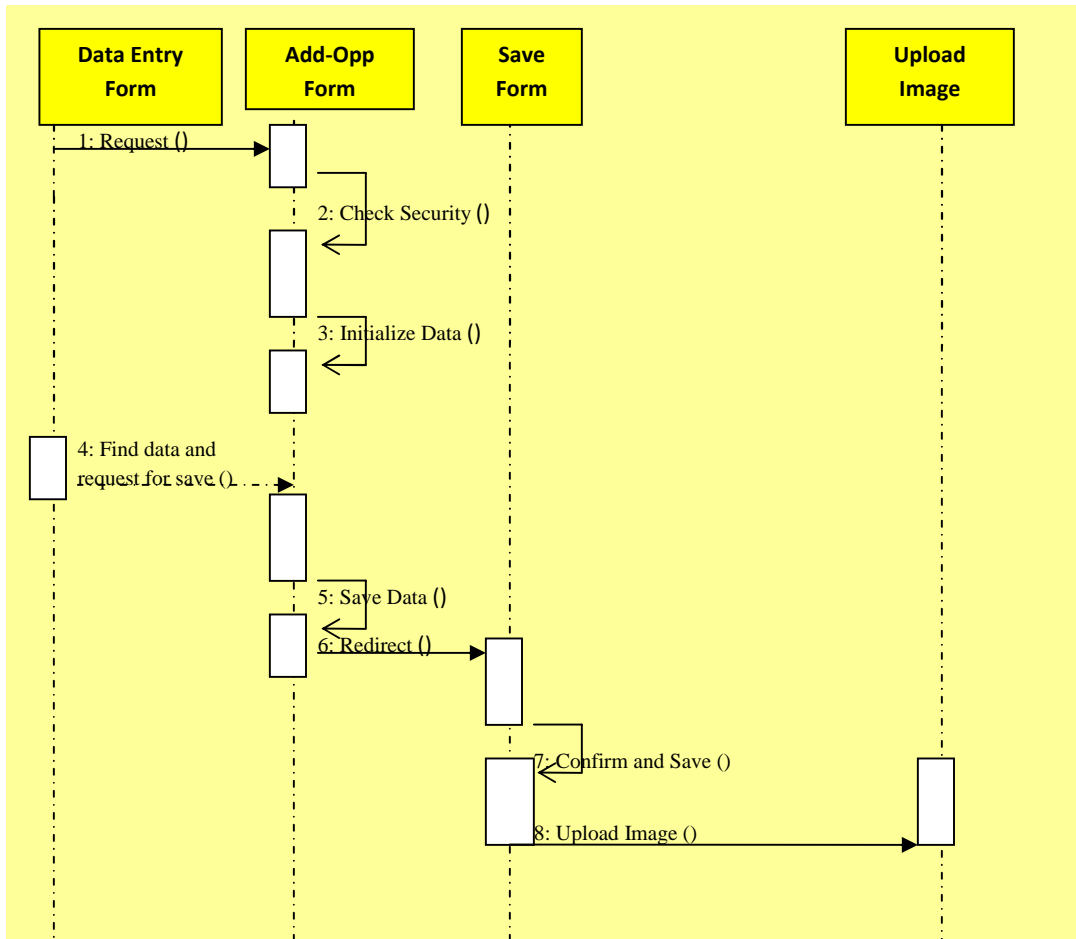


Figure 17. Sequence Diagram for Adding Opportunity

3.2.2.2. Browsing Marketing Opportunity form Backend

Portlet Name	Browsing marketing opportunities
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Opportunity, Opportunities Type, Opportunities, Users, Actors, Status.
Source File(s)	opportunityofinternalactorlist.aspx
Notes	

• Component Diagram for Browsing Opportunity Directory

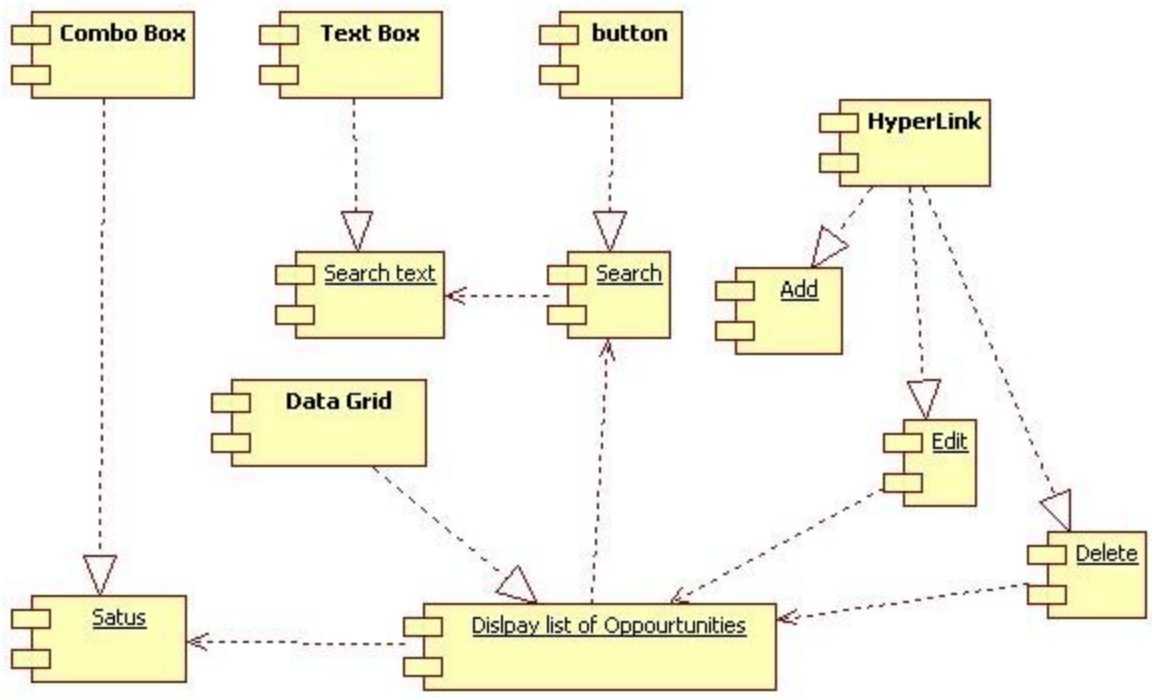


Figure 18. Browse Opportunities at Backend

• **Sequence Diagram for Browsing Opportunity**

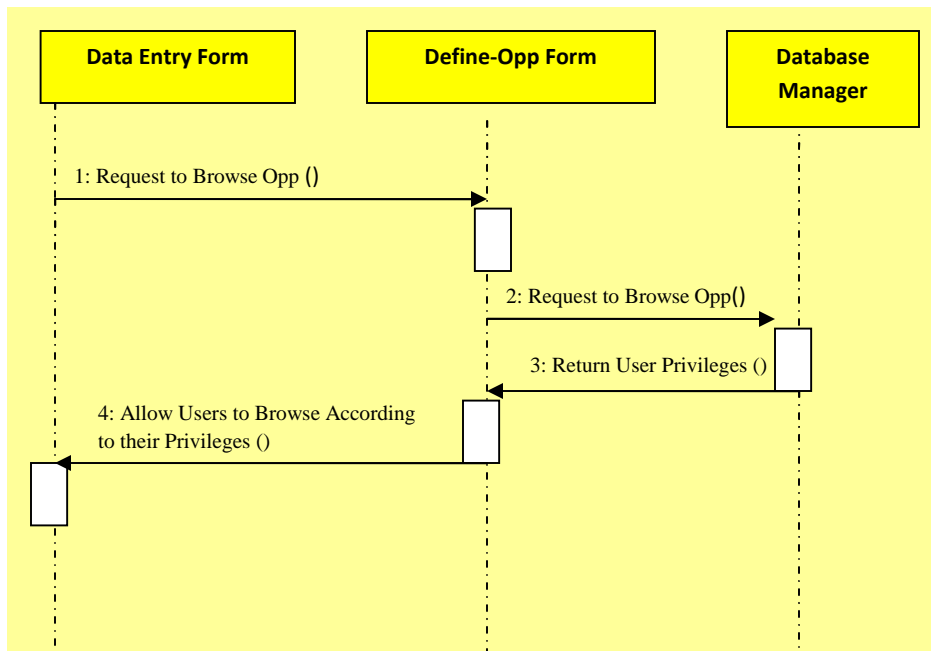


Figure 19. Sequence Diagram for Browsing Marketing Opportunities

3.2.3. Front-end Portlet:

3.2.3.1. Browsing marketing opportunity form

Portlet Name	Browse Marketing Opportunities
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Opportunity, Opportunity Type, Opportunity, Users, Actors, Status.
Source File(s)	Opportunities.aspx
Notes	Only the <i>Opportunities</i> that has been published will be displayed by this portlet

- Component Diagram for Browsing Opportunity Details

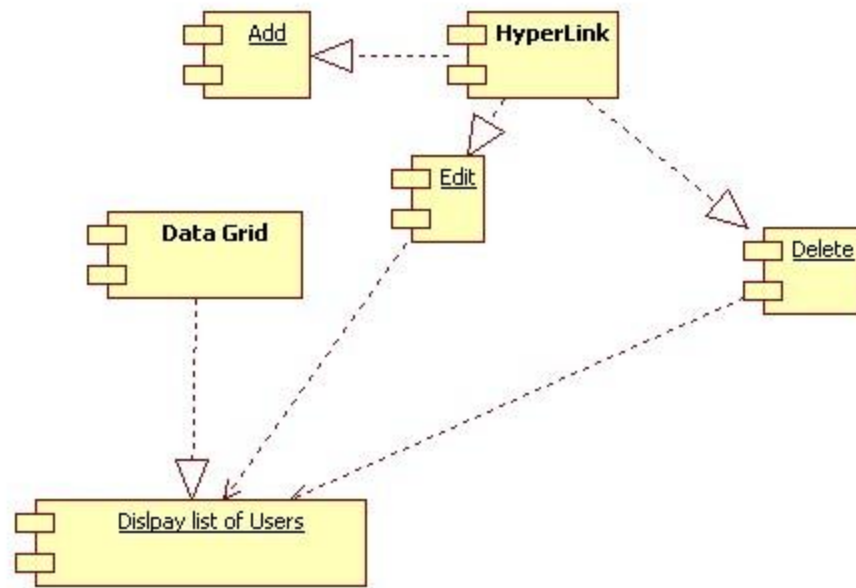


Figure 20. Component Diagram for Browsing Opportunities Form

- **Sequence Diagram for Browsing Opportunity Form**

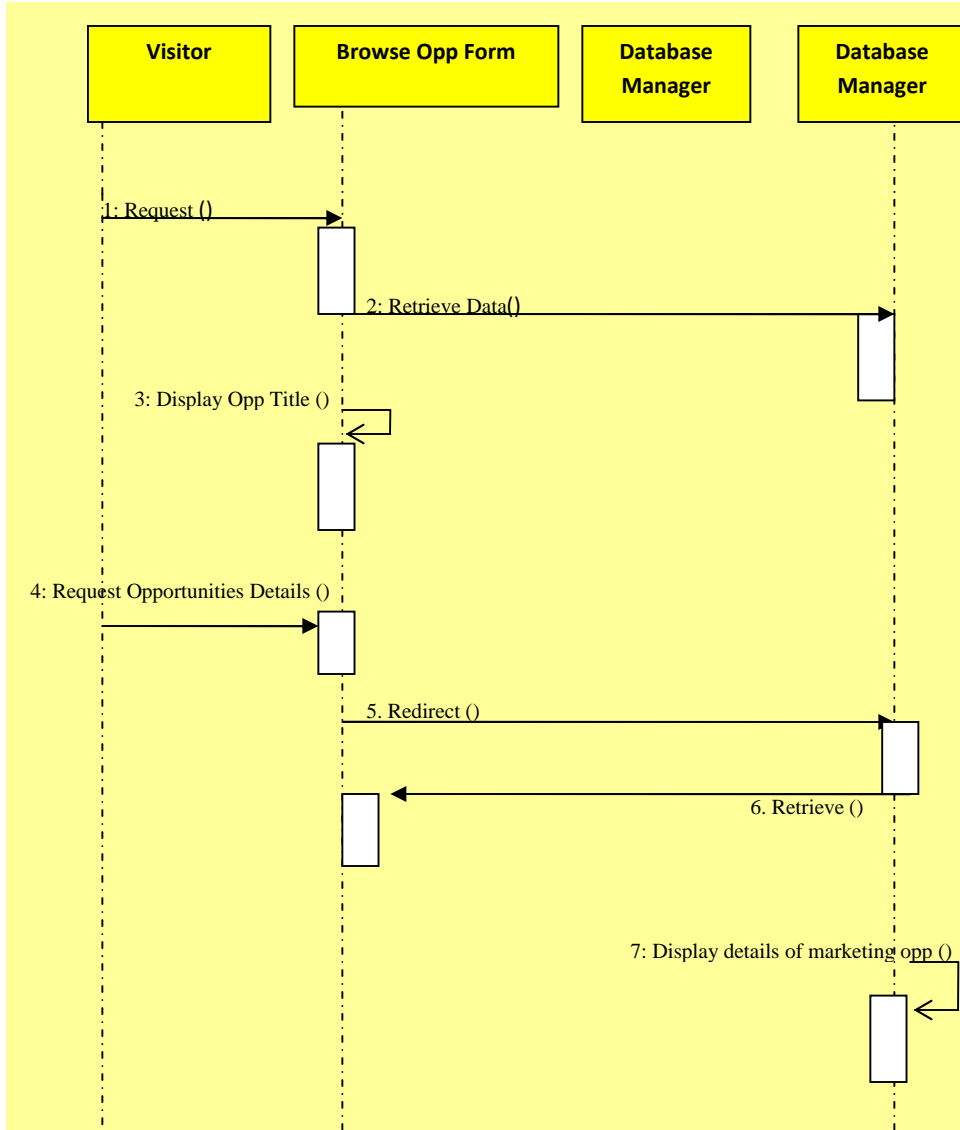


Figure 21. Sequence Diagram for Searching Opportunities

3.2.3.2. Searching Marketing Opportunity Form

Portlet Name	Searching Marketing Opportunities
--------------	-----------------------------------

Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes: Actors, Group, Users, Product/Crop, Status
Source File(s)	OppSearch.aspx
Notes	Only market oppourtunities that has been published will be displayed by this portlet.

• **Component Diagram for Searching Actor Form**

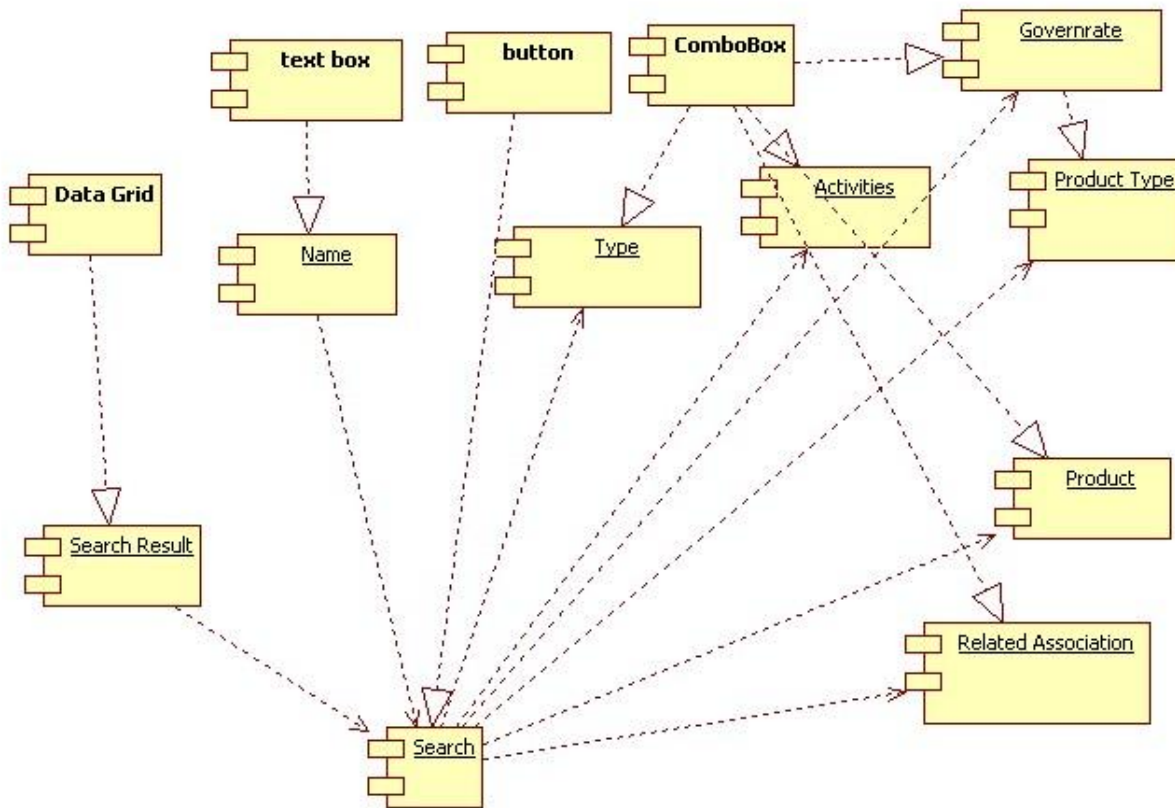


Figure 22. Sequence Diagram for Searching Opportunities

• **Sequence Diagram for Searching Opportunities Form**

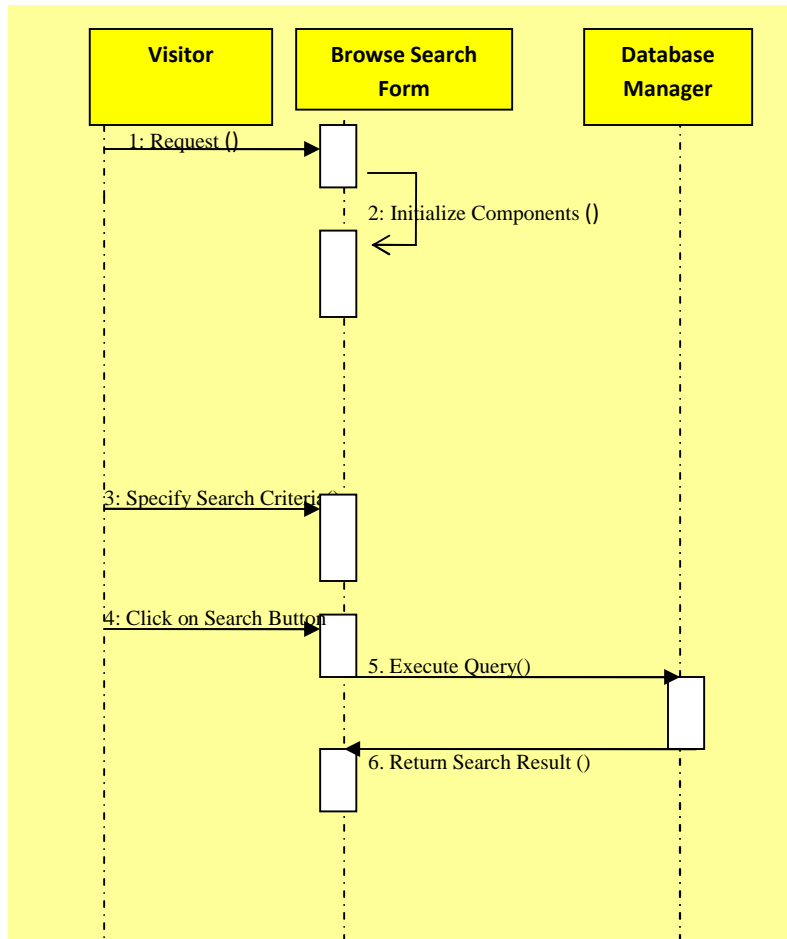
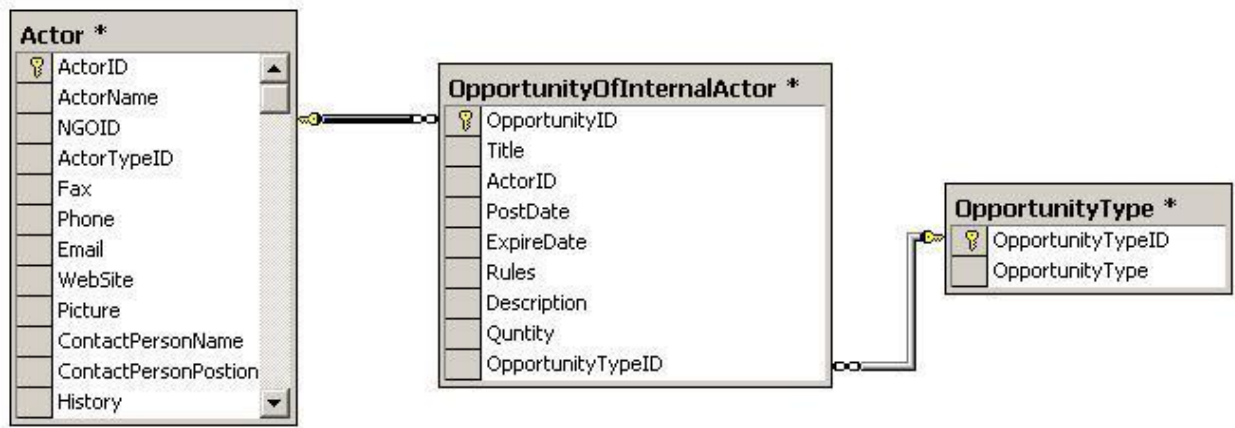


Figure 23. Sequence Diagram for Searching Actor to the Opportunities

3.2.4. ERD of Opportunity DB



3.2.5. Related Tables Description

- **Opportunitytypelist.aspx Screen**

<i>Table Name</i>	<i>Opportunity Table</i>
<i>Description</i>	<i>Store basic data about opportunity type.</i>

<i>Name</i>	<i>Description</i>	<i>Type</i>	<i>Width</i>
Opportunity type ID	Identity number for each Opportunity	smallint (pk)	2
Opportunity type	Describe group Opportunity name	Nvarchar	500

3.3. Sub Modules – Marketing Guide Publications

3.3.1. Component Diagram

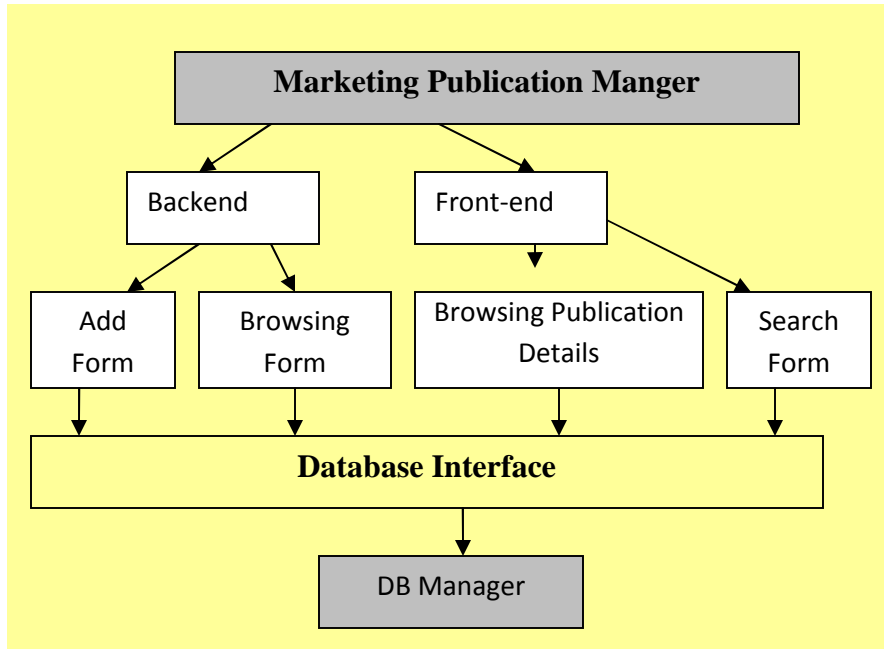


Figure 24. Structured Charts for Marketing Publications

3.3.2. Backend Portlets:

3.3.2.1. Publication Adding Portlet

Portlet Name	Add marketing publication
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Publication, Publication Type, Users, Actors, Status.
Source File(s)	Publicationadd.aspx
Notes	

- **Component Diagram for Adding Publication Form**

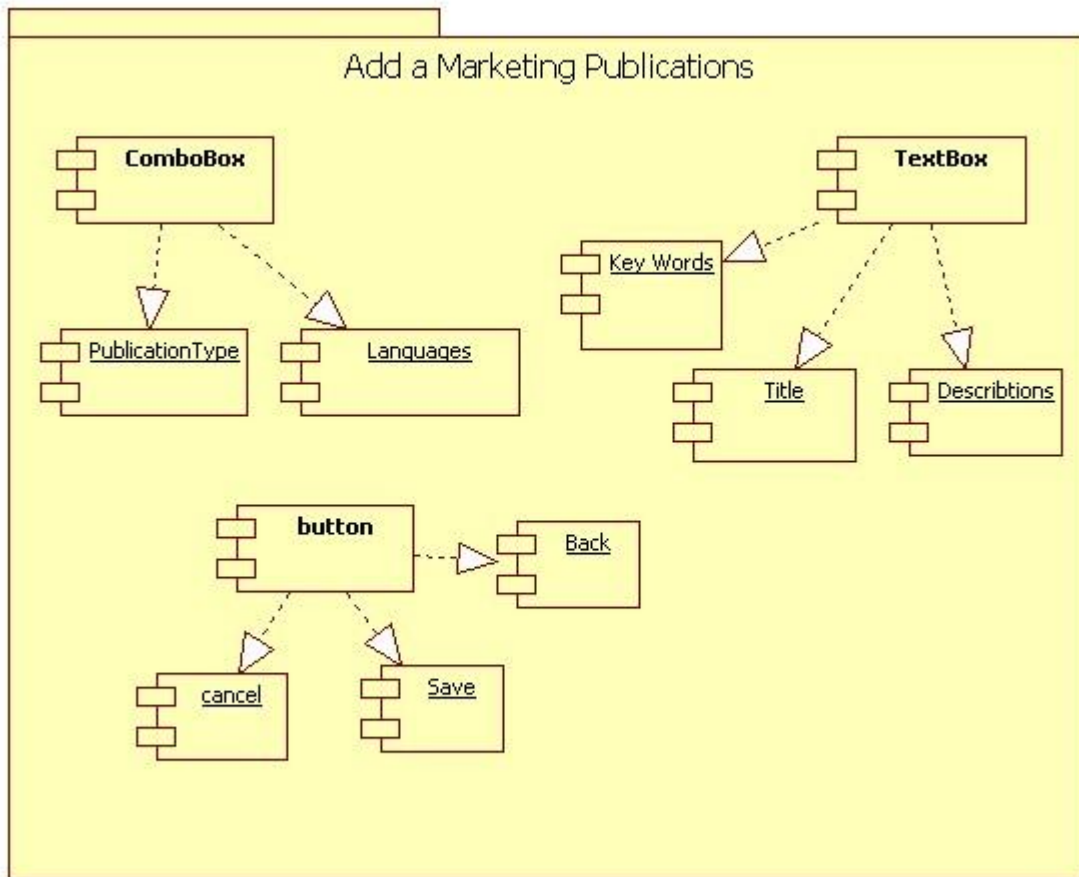


Figure 25. Component diagram for add publication form

• Sequence Diagram for Adding Publication form

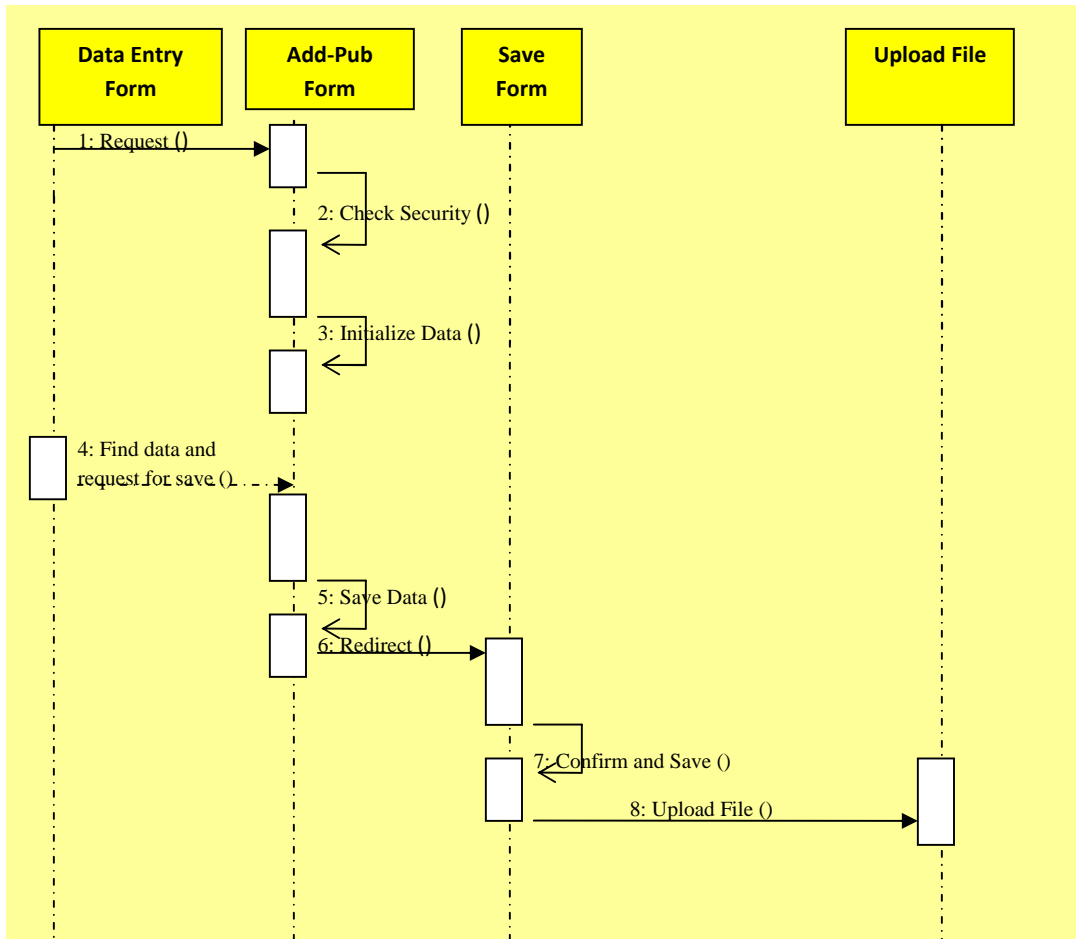


Figure 25. Sequence Diagram for Adding Marketing Publications

3.3.2.2. Browsing Marketing Publications form Backend

Portlet Name	Browsing marketing publication
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Publication, Publication Type, Users, Actors, Status.
Source File(s)	Publicationlist.aspx
Notes	

✚ **Component Diagram for Browsing Marketing Publications**

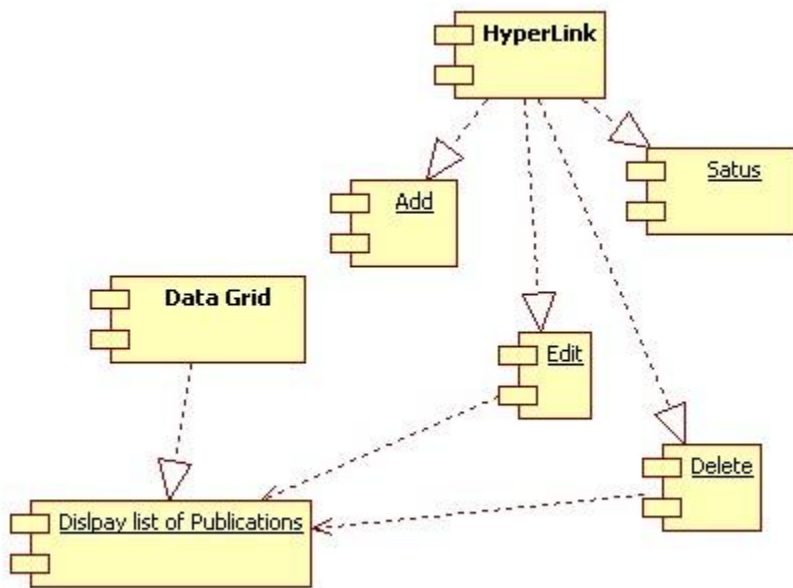


Figure 26. Browse Publications at Backend

- Sequence Diagram for Browsing Publications

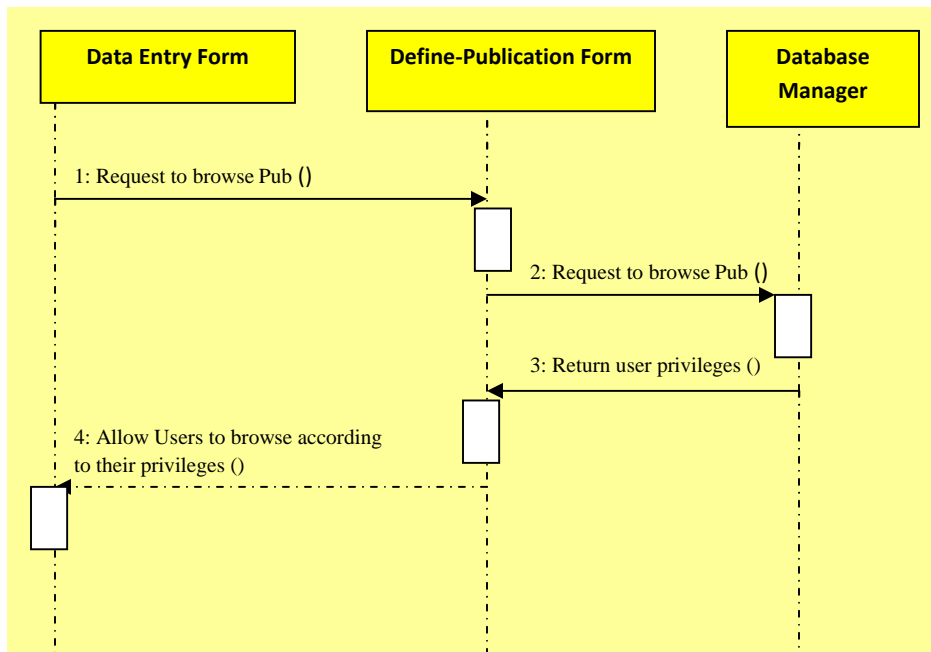


Figure 27. Sequence Diagram for Browsing Marketing Publications

3.3.3. Front-end Portlet:

3.3.3.1. Browsing marketing publications form

Portlet Name	Browse Marketing Publications
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Publication, Publication Type, Users, Actors, Status.
Source File(s)	Publication.aspx
Notes	Only the <i>Publications</i> that has been published will be displayed by this portlet

- Component Diagram for Browsing Publications Details

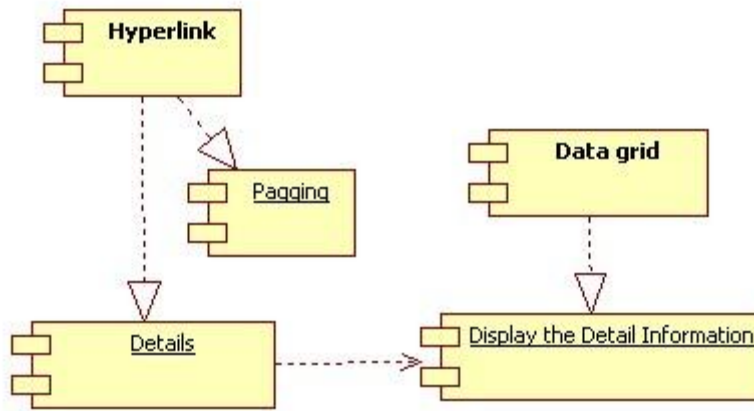


Figure 28. Component Diagram for Browsing Publication Form

- **Sequence Diagram for Browsing Publications Form**

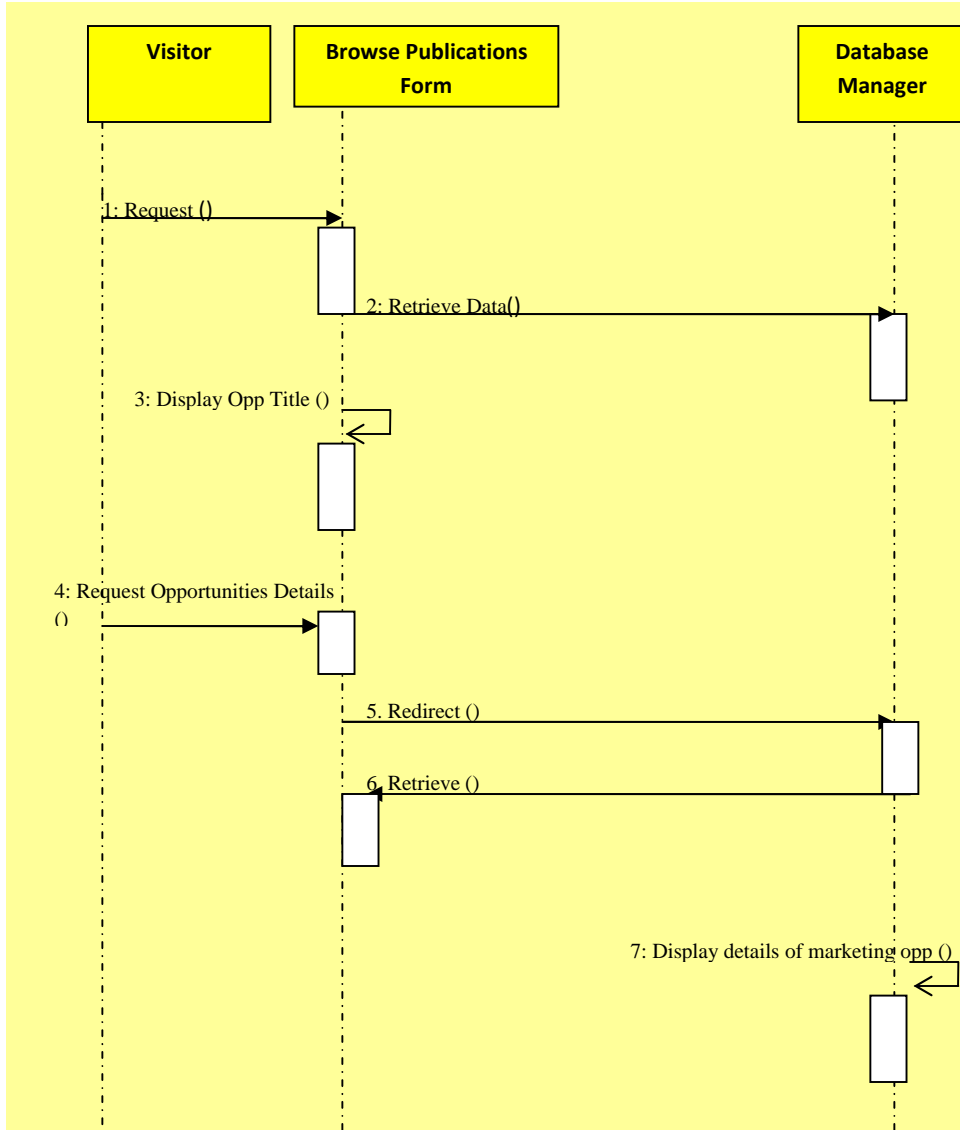


Figure 29. Sequence Diagram for Searching Publications

3.3.3.2. Searching Marketing Publications Form

Portlet Name	Searching Marketing Publications
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Publication, Publication Type, Users, Actors, Status.
Source File(s)	PubSearch.aspx
Notes	Only market publications that has been published will be displayed by this portlet.

Component Diagram for Searching Publication Form

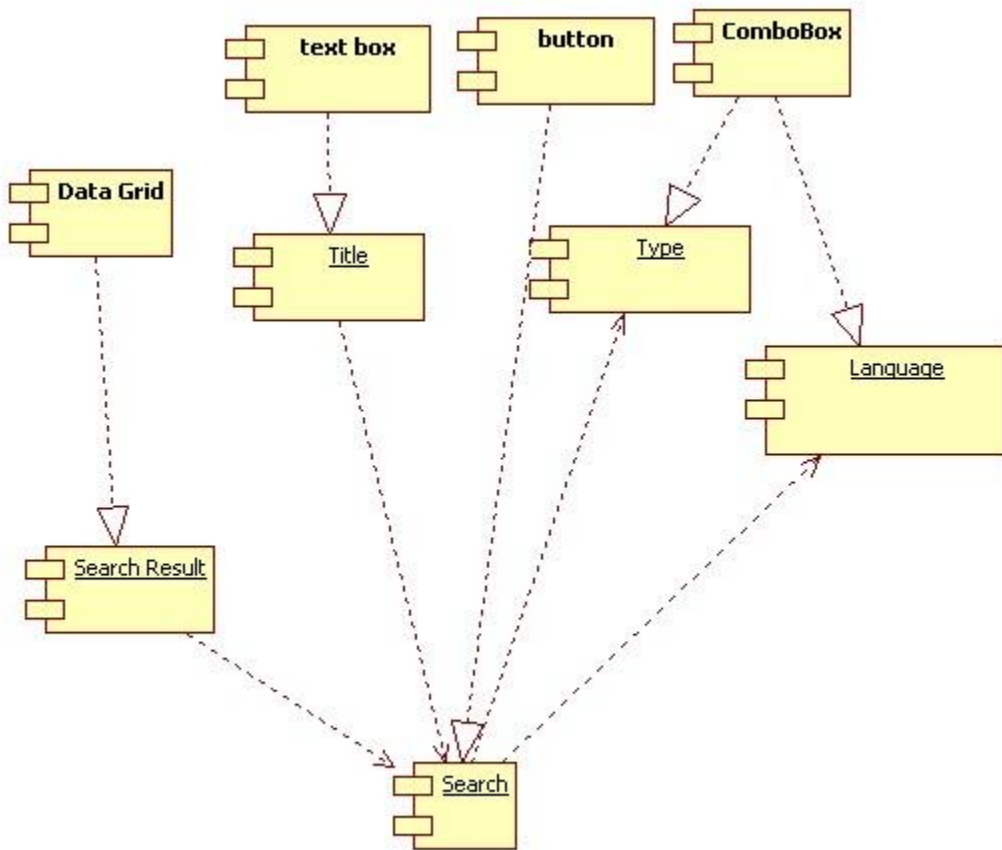


Figure 30. Sequence Diagram for Searching Publications

• Sequence Diagram for Searching Publications Form

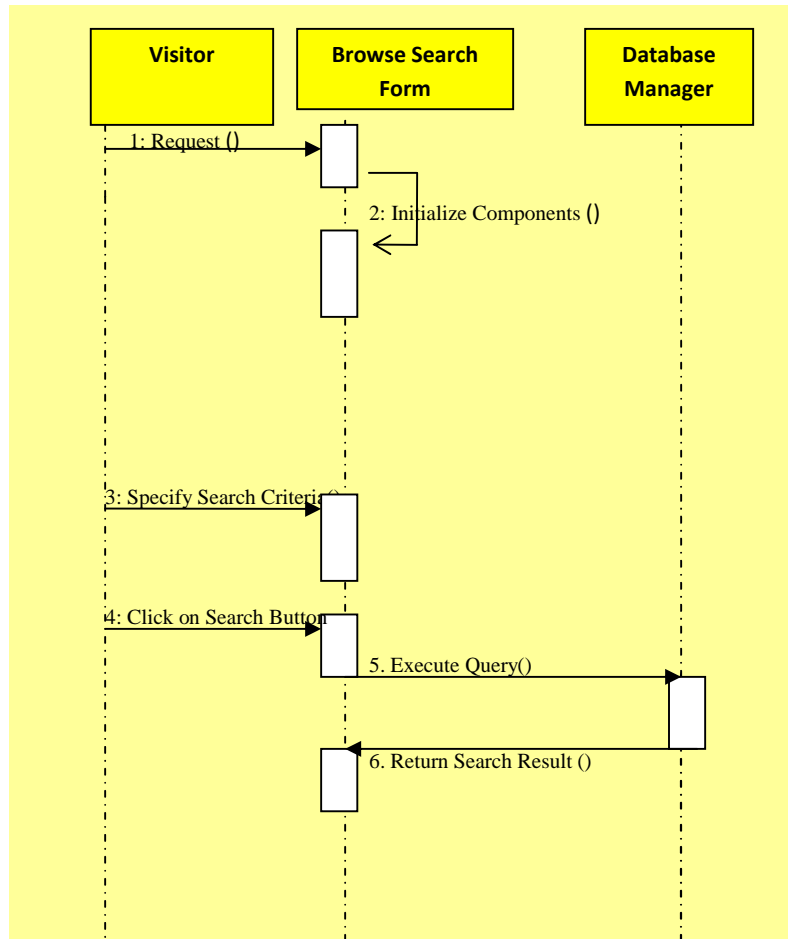


Figure 31 Sequence Diagram for Searching Marketing Publications

3.3.4. ERD of all Marketing Publications DB

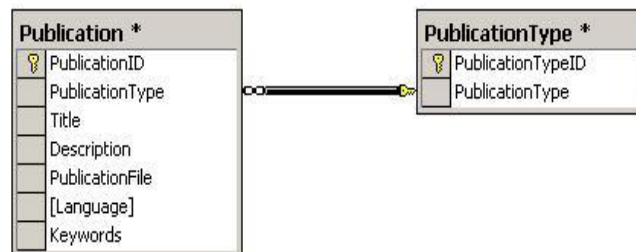


Figure 43. ERD of the Marketing Publications

3.4. Sub Modules – Marketing Successful Stories

3.4.1. Component Diagram

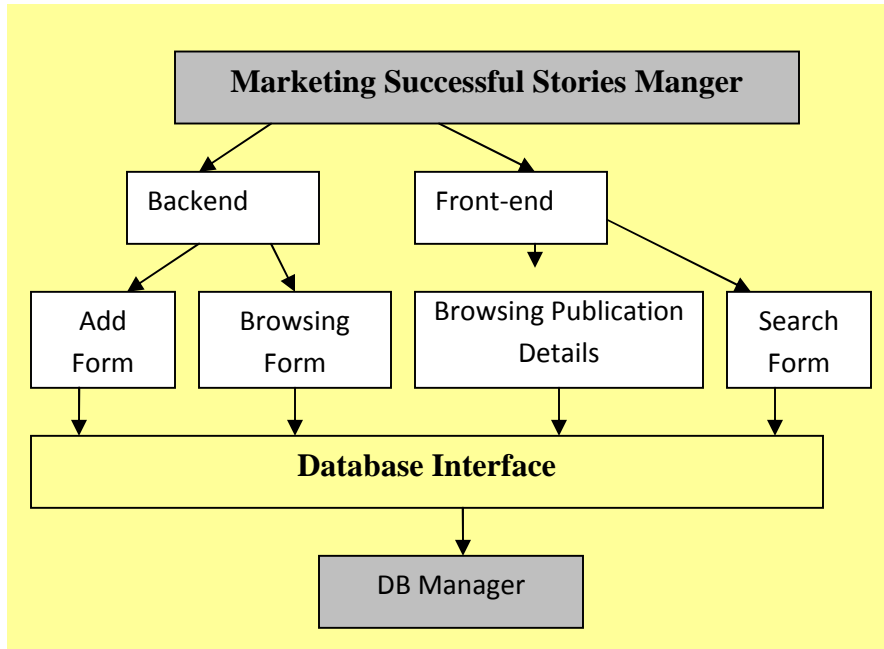


Figure 32. Structured Charts for Marketing Successful Stories

3.4.2. Backend Portlets:

3.4.2.1. Publication Adding Portlet

Portlet Name	Add marketing Successful Stories
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Successful Stories, Governorate, Users, Actors, Status.
Source File(s)	Publicationadd.aspx
Notes	

- **Component Diagram for Adding Successful Story Form**

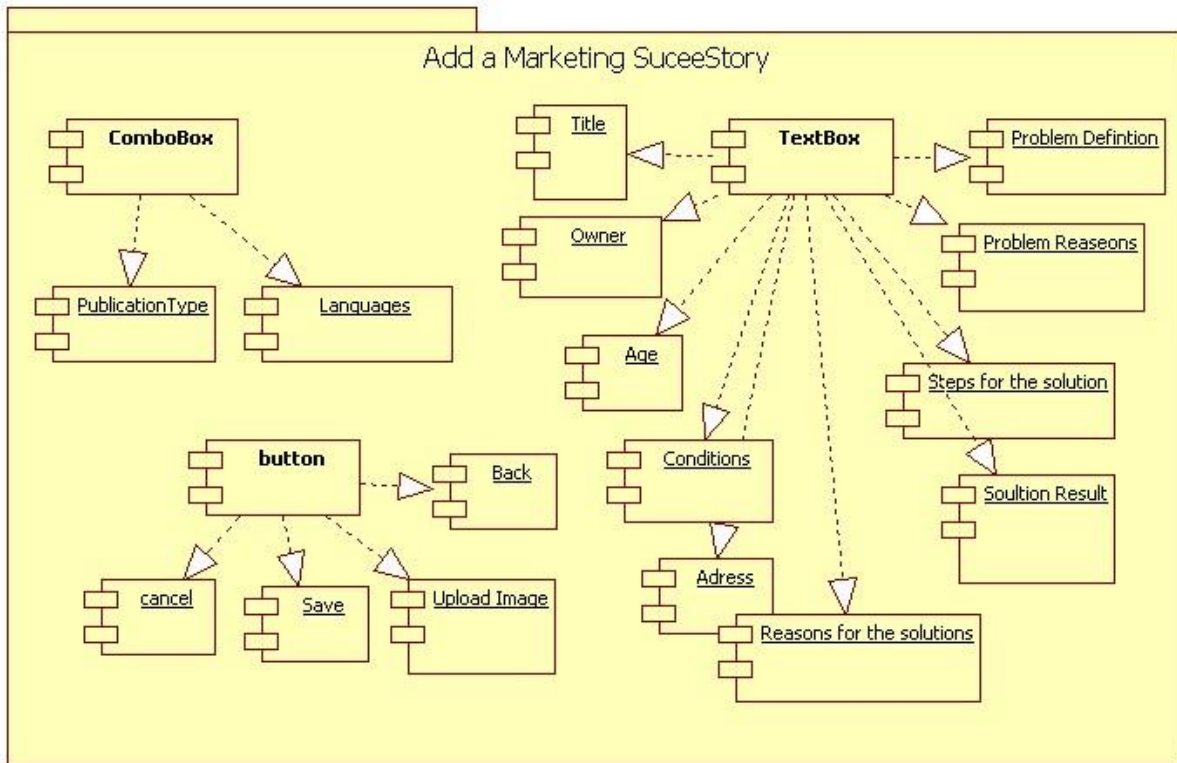


Figure 33. Component diagram for add Successful Story form

• Sequence Diagram for Adding Successful Stories form

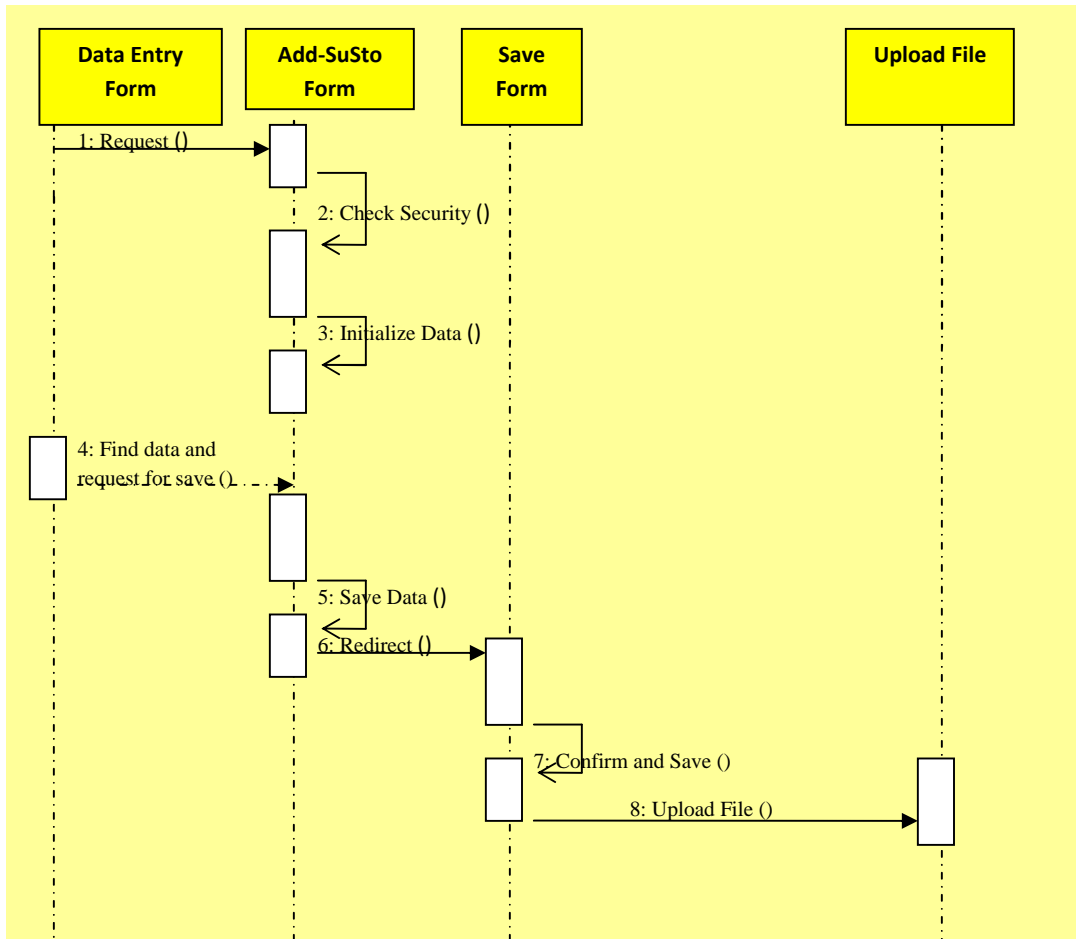


Figure 34. Sequence Diagram for Adding Marketing Successful Story

3.4.2.2. Browsing Marketing Successful Story form Backend

Portlet Name	Browsing marketing Successful Story
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Successful Story, Users, Actors, Status.
Source File(s)	Publicationlist.aspx
Notes	

- **Component Diagram for Browsing Marketing Successful Stories**

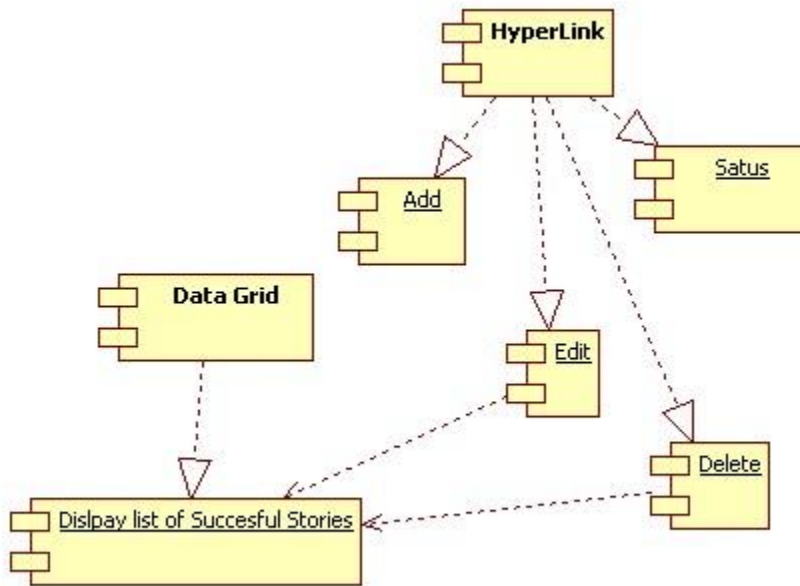


Figure 35. Browse Successful Story at Backend

• **Sequence Diagram for Browsing Successful Story**

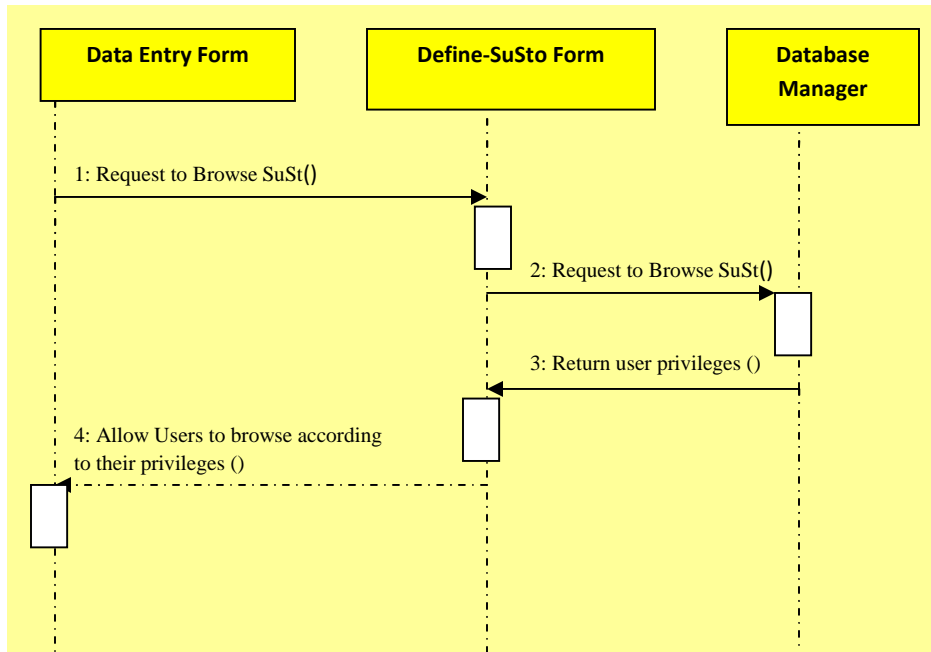


Figure 31. Sequence Diagram for Browsing Marketing Successful Story

3.4.3.Front-end Portlets:

3.4.3.1.Browsing marketing Successful Story form

Portlet Name	Browse Marketing <i>Successful Stories</i>
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Successful Stories, Governorate, Users, Actors, Status.
Source File(s)	SuccStorieslist.aspx
Notes	Only the <i>Successful Useful Story</i> that has been published will be displayed by this portlet

- **Component Diagram for Browsing Successful Stories Details**

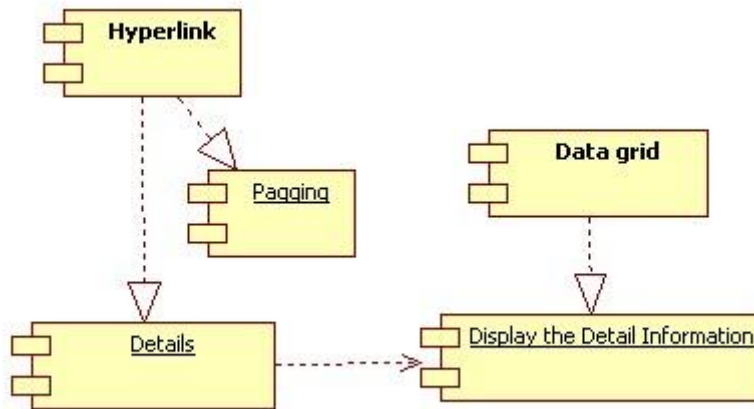


Figure 32.Component Diagram for Browsing Successful Stories Form

• Sequence Diagram for Browsing Successful Stories Form

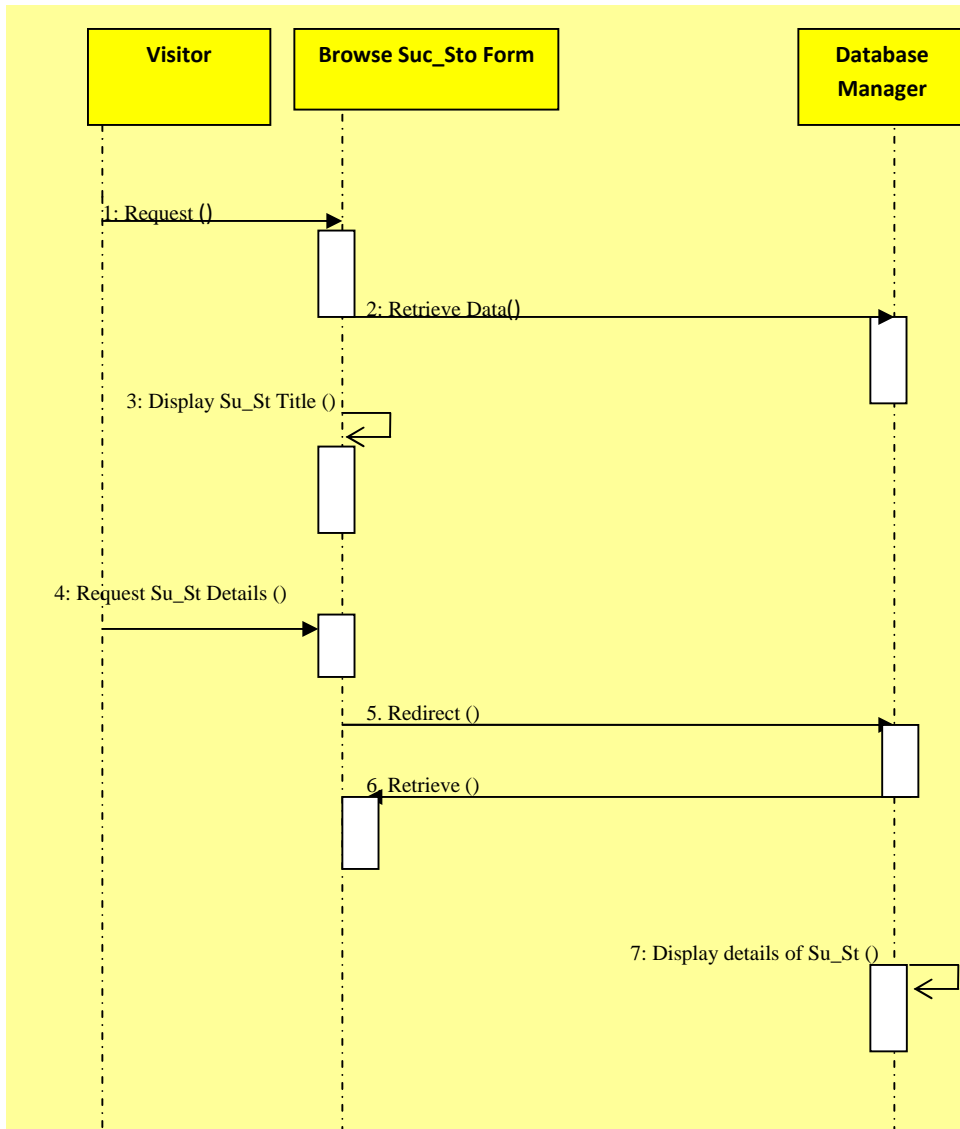


Figure 33. Sequence Diagram for Searching Successful Stories

3.4.3.2. Searching Marketing Successful Stories Form

Portlet Name	Searching Marketing Successful Story
Portlet Function	
Reuse	<input type="checkbox"/> Written from scratch
Depends on other Portlets?	No
Depends on Database Tables	Yes, Successful Story, Users, Actors, Status.
Source File(s)	
Notes	Only Successful Stories that has been published will be displayed by this portlet.

• **Component Diagram for Searching Successful Stories Form**

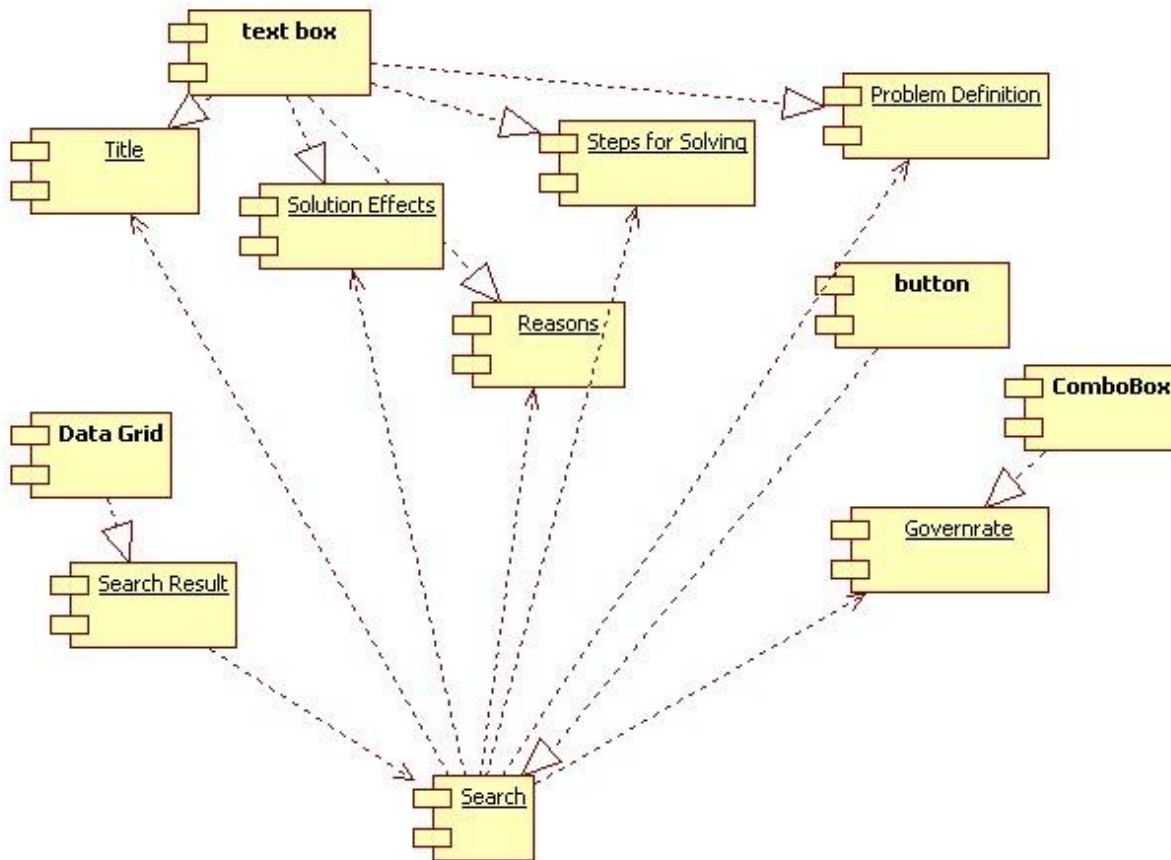


Figure 39. Sequence Diagram for Searching Successful Stories

• Sequence Diagram for Searching Successful Stories Form

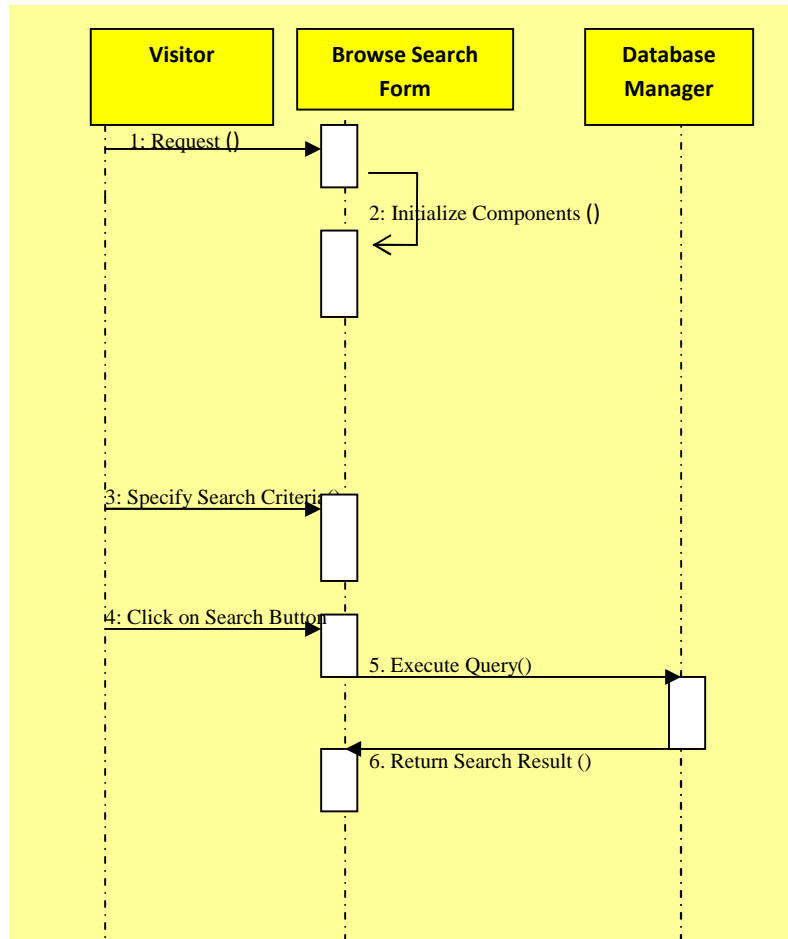


Figure 40. Sequence Diagram for Searching Marketing Successful Stories

3.4.4. ERD of Marketing Successful Stories

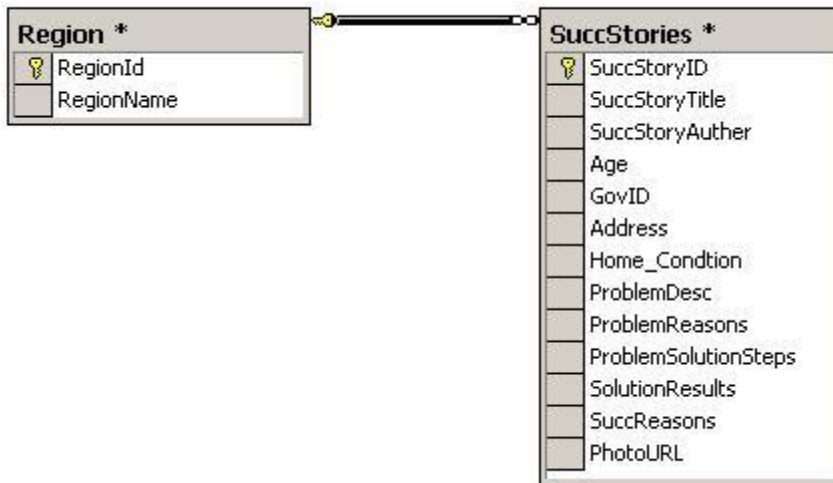


Figure 44. ERD of the Marketing Successful Stories

3.4.4. Related Tables Description

<i>Table Name</i>	<i>SuccStory Table</i>
<i>Description</i>	<i>Store basic data about successful Story</i>

- **List of columns of the SuccStory table**

<i>Name</i>	<i>Description</i>	<i>Type</i>	<i>Width</i>
SuccStoryID	Identity number for each Successful Story	int(pk)	4
SuccStoryAuther	Successful Story Author	nvarchar	50
Age	Author Age	nvarchar	50
GovID	Governorate Id of the author	int(fK)	4
Address	Author Address	nvarchar	50
Home_Condtion	Environmental Conditions	nvarchar	50
ProblemDesc	Problem Descriptions	nvarchar	100
ProblemReasons	Problem Reasons	nvarchar	100
ProblemSolutionSteps	Problem Solution Steps	nvarchar	500
SolutionResults	Solution Result	nvarchar	100
SuccReasons	Successful Reasons	nvarchar	100
PhotoURL	Location of the uploaded Image	nvarchar	100

Section 4. Function Description

The backend of the MIM provides the basic data entry functionality for special users of the stakeholders who have authentication to create new, preview, modify, and delete data records.

4.1. Insert New Record

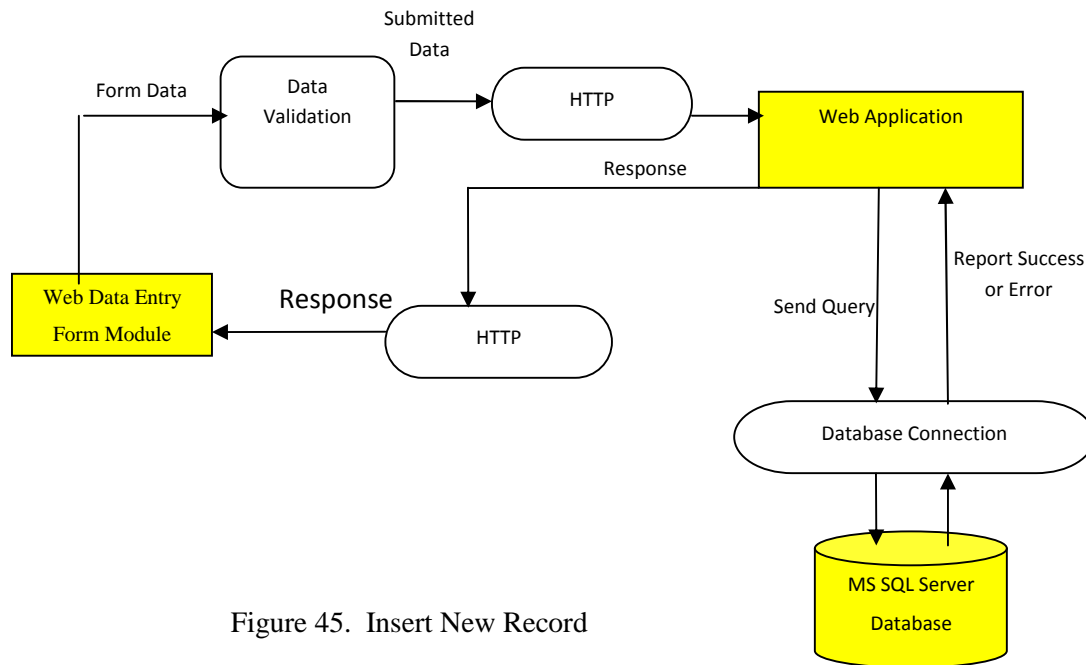


Figure 45. Insert New Record

The insert new record task is performed according to the following scenario:

- 1 – The user requests the new data entry form
- 2 – The form drop down menus controls are initialized from lookup tables
- 3 – The user fills in form fields and presses the submit command button
- 4 – Form Data are validated locally at client site, and mandatory data are checked for completion
- 5 – If data are complete and consistent, form data are submitted to the web server via the POST or GET method
- 6 – The web application initializes a database connection to the database server
- 7 – The web application execute the appropriate SQL command to insert form data into MIM database
- 8 – The web application closes the database connection.

4.2. Update Data Record

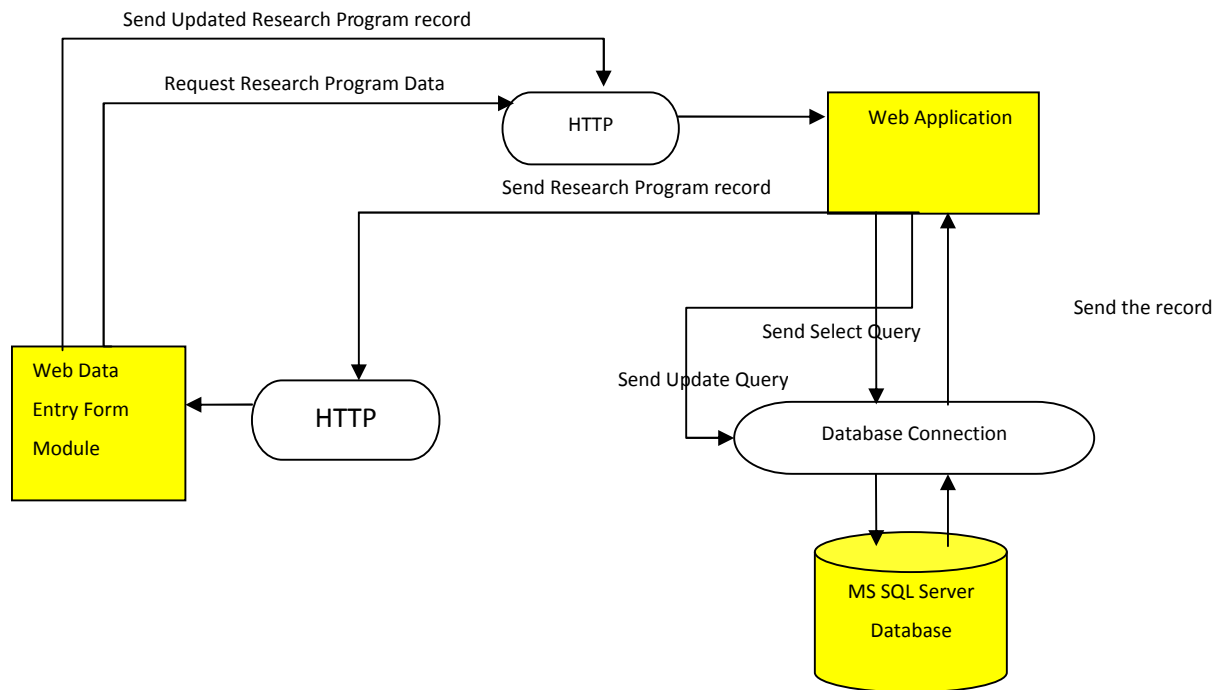


Figure 46.Update record data

The task of updating data record can be undertaken according to the following scenario:

- 1 – The user selects one the update link for the record
- 2 – The selected record data are retrieved and rendered into the data entry form to allow user review and update data if required
- 3 – After modifying the data fields, the user clicks the submit button to send the data for saving into the database.
- 4 – After validating form data, the form fields' values are sent to the web application via the POST or GET method
- 5 – The web application receives the data and opens a connection with the MIM database server
- 6 – The web application execute an SQL update command the update data.
- 7 – The web application closes the database connection

4.3. Delete Record

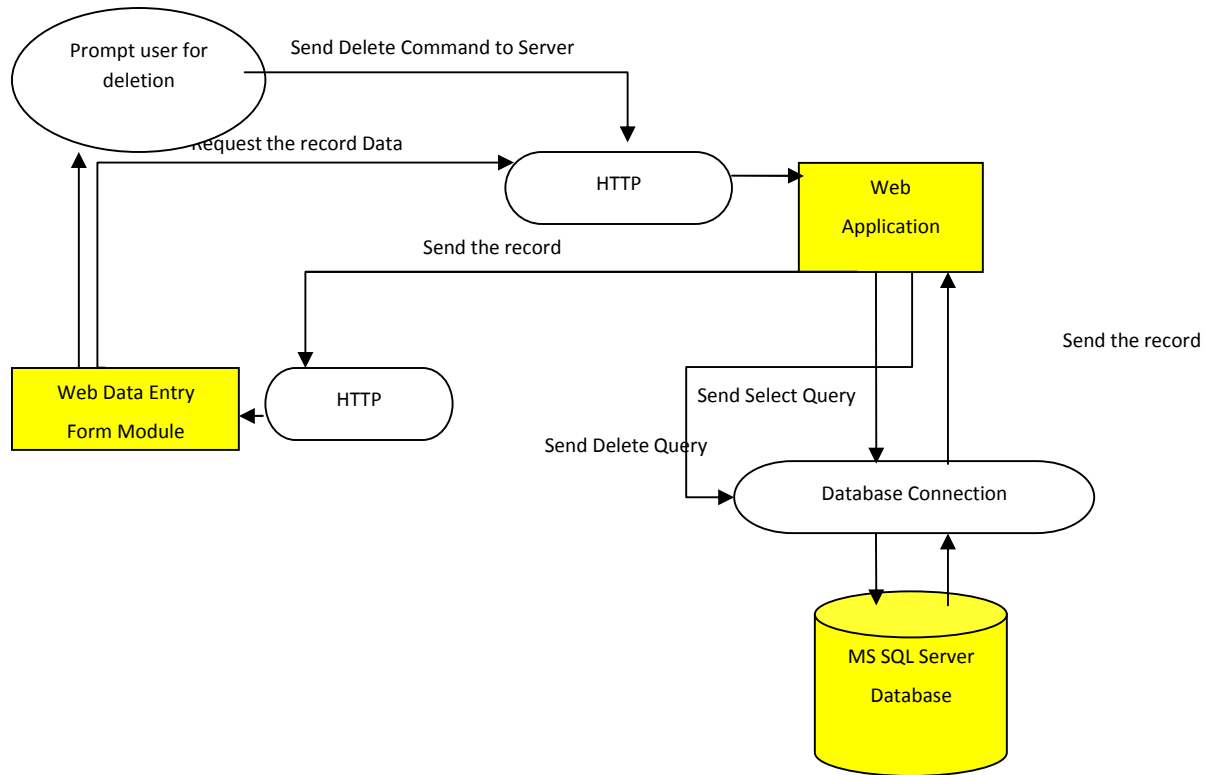


Figure 47. Delete record

The task of deleting record can be performed according to the following scenario:

- 1 – The user selects one the record,
- 2 – The selected record data are retrieved and rendered into the data entry form to allow user review
- 3 – The user clicks the delete button to remove the record from the database
- 4 – If the record has Childs, then the user is informed that deletion cannot be executed, and then the user has to remove all Childs records before deleting the record. Otherwise the user is giving a warning at client side that s/he is about to remove a record from the database. If the user confirms the deletion action, a delete action is sent to the web application
- 5 – The web application opens a database connection to the MIM database server
- 6 – The web application executes an SQL statement to delete the record
- 7 – The web application closes the connection to the MIM database

Section Five. Graphical User Interface

5.1. Front-end Screens

Font-end of the marketing module consists of four sub-modules that are marketing directories, opportunities, marketing publications guider and successful stories.

The screenshot shows a Microsoft Internet Explorer browser window displaying the website <http://www.radcon.sci.eg/marketing/>. The page layout includes a top navigation bar with 'الرئيسية' (Home) and 'اتصل بنا' (Contact Us) buttons. A large banner image at the top depicts farmers in a field. Below the banner, there are several content modules. A callout box points to the browser's address bar, indicating the 'Front-end URL: Radcon.claes.sci.eg/marketing'. Another callout box points to the banner area, labeled 'Marketing information module'. A third callout box points to a sidebar module titled 'دليل الترويجي' (Promotional Guide), which lists various services and contact information, labeled 'Marketing Directories'. The main content area features a section titled 'نصائح معلومات التسويقية' (Marketing Information Tips) with a list of articles and a small image of oranges.



Figure 48. Front-end Home page Screen

Figure 48.Main Page of Marketing Module

✚Sub-Directories : Marketing Directory

It consists of four sub-links that are *growers, producers, exporters and advanced search* links. For each *growers, producers, exporters'* link, there are associated members names that will be appeared when click on this link. For example, all *growers'* names and their types (company, farm, etc...) will be appeared after click on the *growers'* link as shown in figure2. All information (personal, activity, contact) about a grower will be appearing after click on his name as sown in figure49.

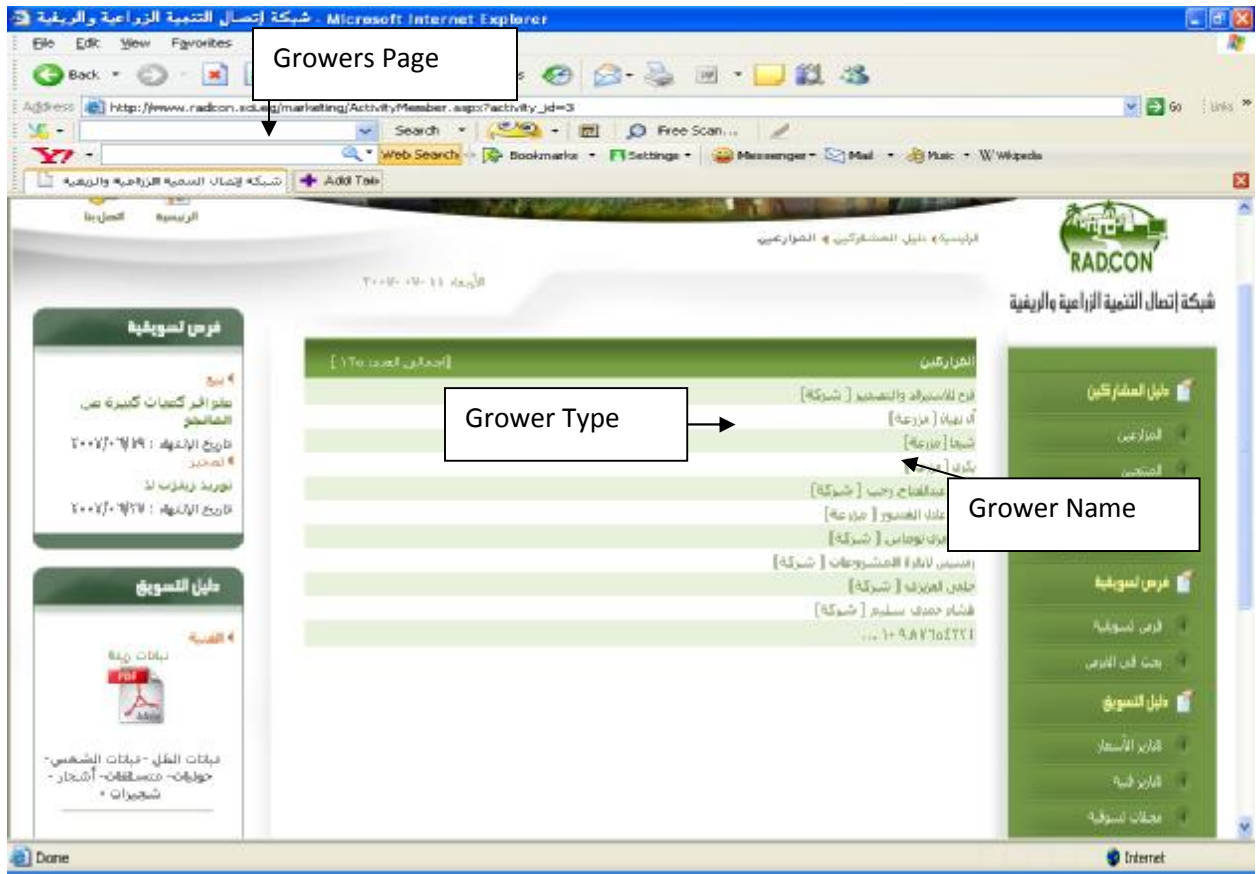
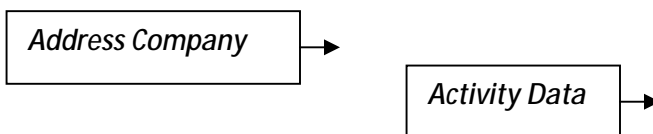


Figure 49. Growers' names Screen



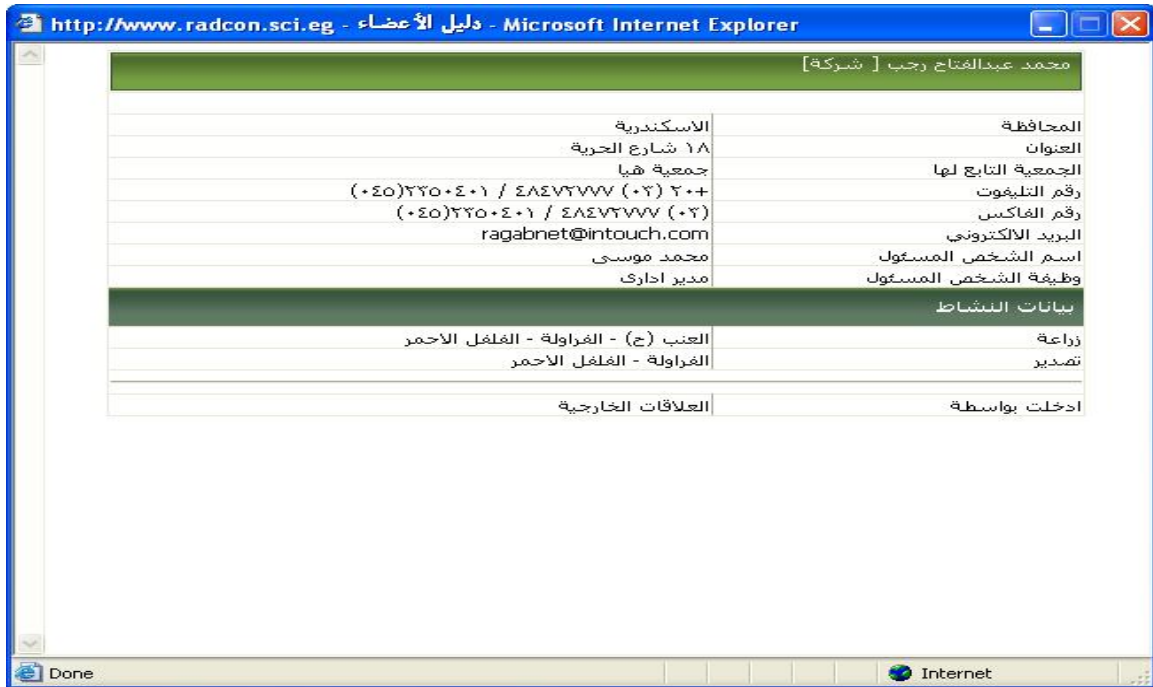


Figure 50. Grower Details Screen

- And as the same in both growers and producers.

- **Advanced Search**

This link provides the advanced search capability. By using this capability different search criteria (search by *Grower Name, Type, Activity, Crop/product and the Related Association*) can be applied.

- **Input:** specific searching keywords.
- **Output:** Display one or more page that reflects the search target that associated paging capabilities.

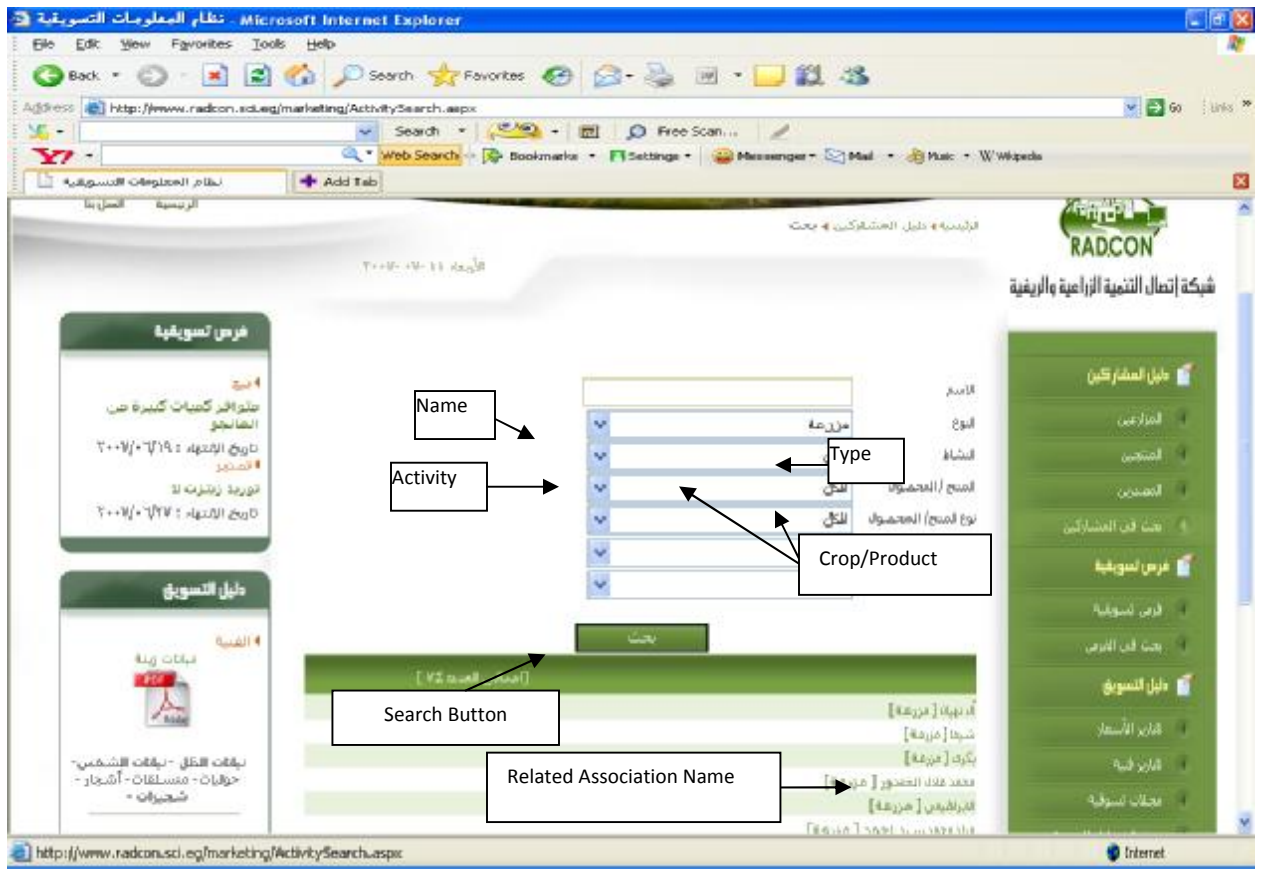


Figure 51. Advanced Search Screen

Different search criteria are available. Public user can search about "All farms that grow fruits and are members ". By choosing grower type: individuals, farm, company, organization. Figure 51 represents search result, there are different farm names. For more information about that farm, a user can click on the name of each of them.

- **Sub-Modules: Marketing Opportunities**

Second link in the home page of the marketing modules is the marketing opportunities. As shown in figure52, after clicking on the marketing opportunity link, all available opportunities (export, Import, Buy and Sell) will appear. For more details, a user can click on the name and see all opportunity information as shown in figure7.



Figure 53. Marketing Opportunities Screen

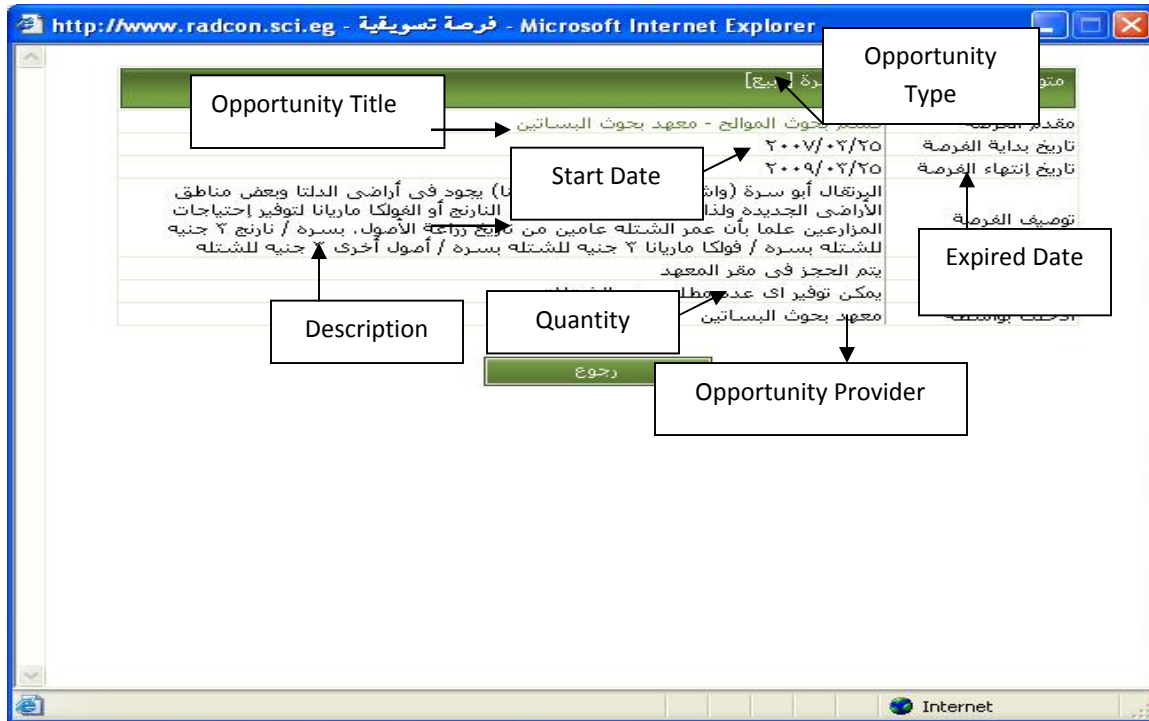


Figure 54. Opportunity Details Screens

- **Opportunities Advanced Search**

This link provides the advanced search capability. By using this capability, different search criteria (search by *Grower Name, Type, Activity, Crop/product and the Related Association*) can be applied.

- **Input:** Select or enter specific searching keywords.
- **Output:** Display one or more page that reflects the search target.

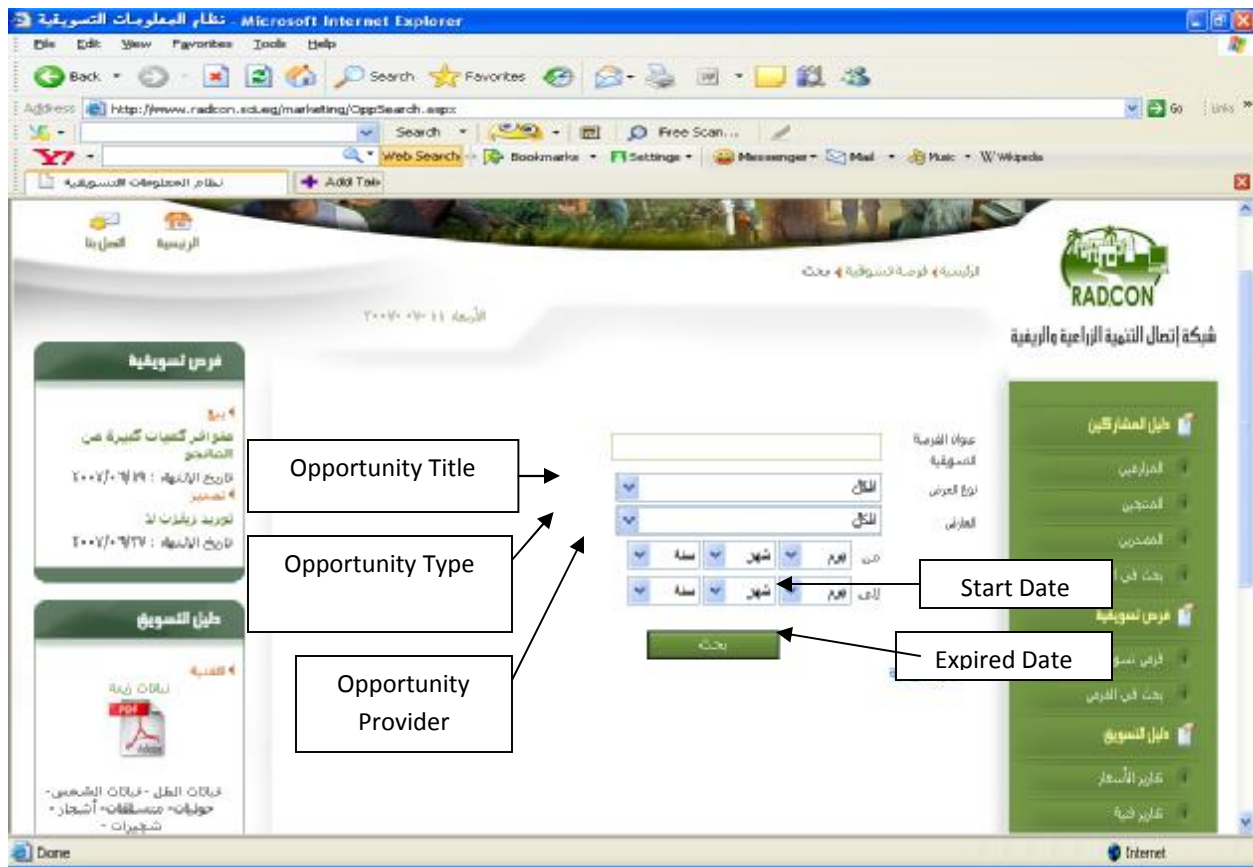


Figure 55. Opportunity Search Screens

- *Marketing Guider*

By using this link, user can get all marketing publications (technical reports, local and foreign market prices reports, magazines, etc...). As shown in figure 8, for each publication type there is a link that leads to see more information about it with download facilities, as shown in figure 56.

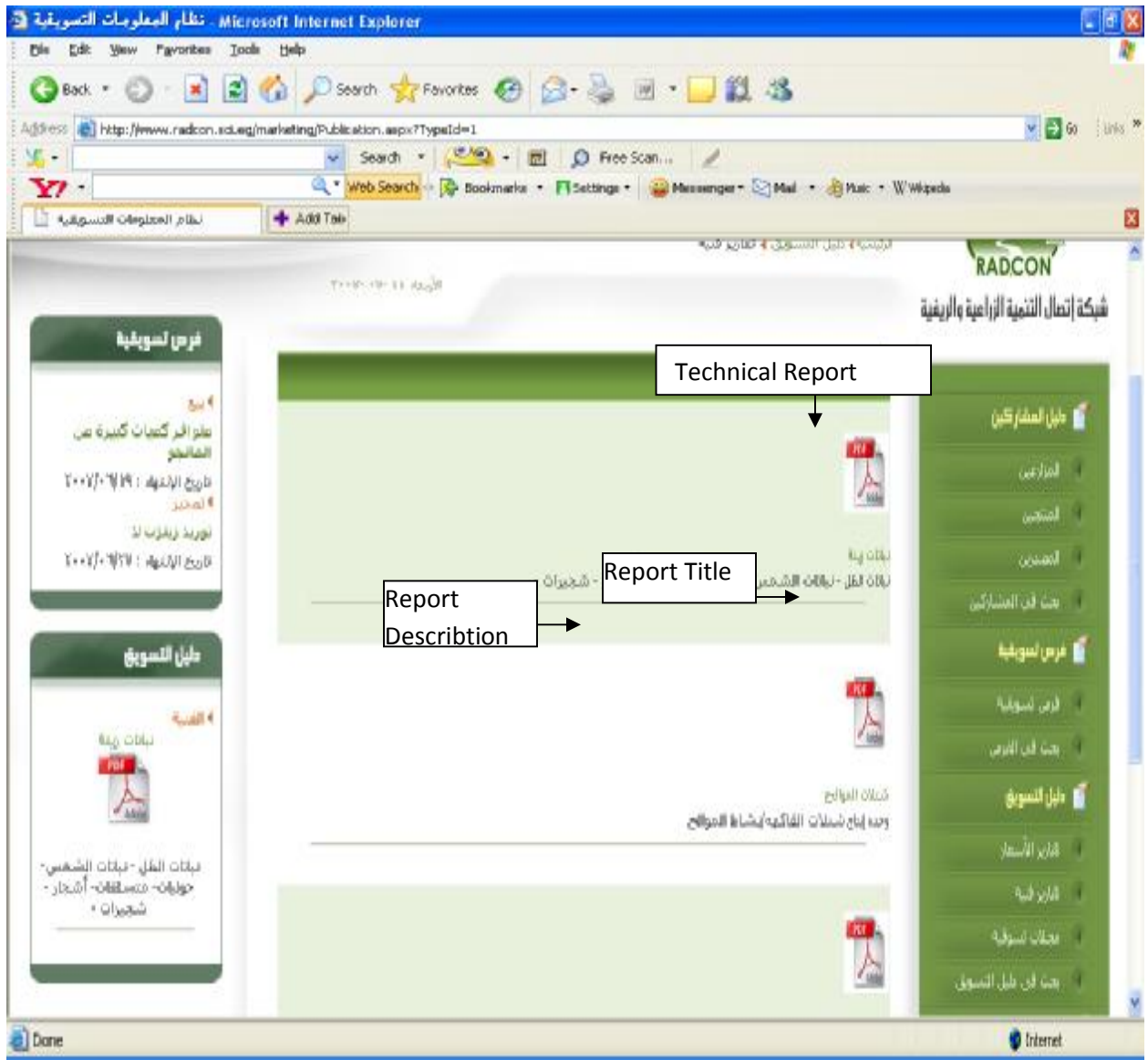


Figure 56. Marketing Guider Screen

- *Advanced Search*

This link provides the advanced search capability. By using this capability different search criteria (search by *Publication Title*, *Publication Type*) can be applied.

- **Input:** Select or enter specific searching keywords.
- **Output:** Display one or more page that reflects the search target.

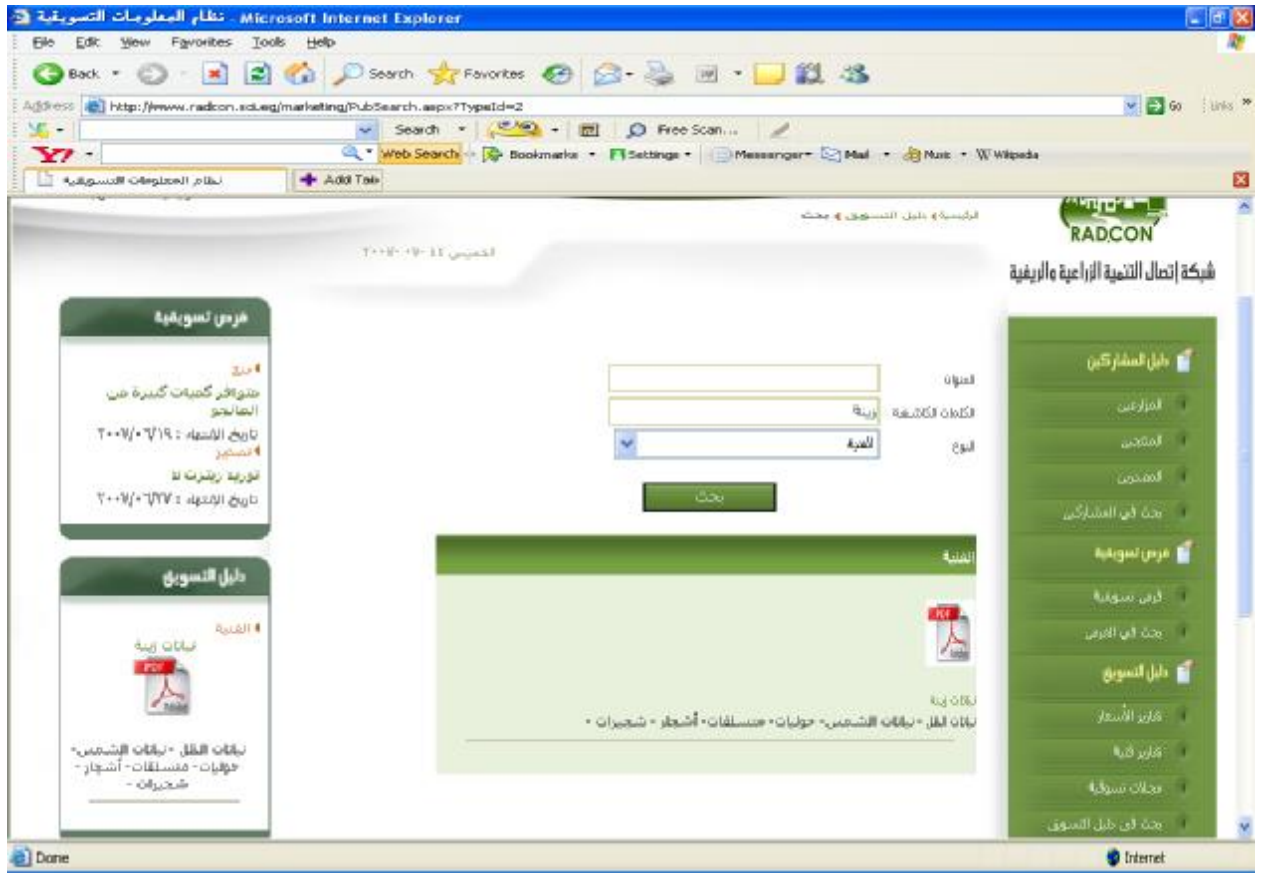


Figure 57. Guider Search Result Screen

To see more details, user can click on the publication title. A new window will appear, as shown in Figure 58.



Figure 58. Marketing Publication Details Screen

5.2. Back-end Screens

- *Marketing Directories (Members Data)*

By clicking on this link, member data form of will appear. As shown in figure 59, Member data consists of two parts, the first is personal and contact information data (Name, Type, Related association, fax, telephone, web site contact person, contact person job , other information and with capability of upload an image).

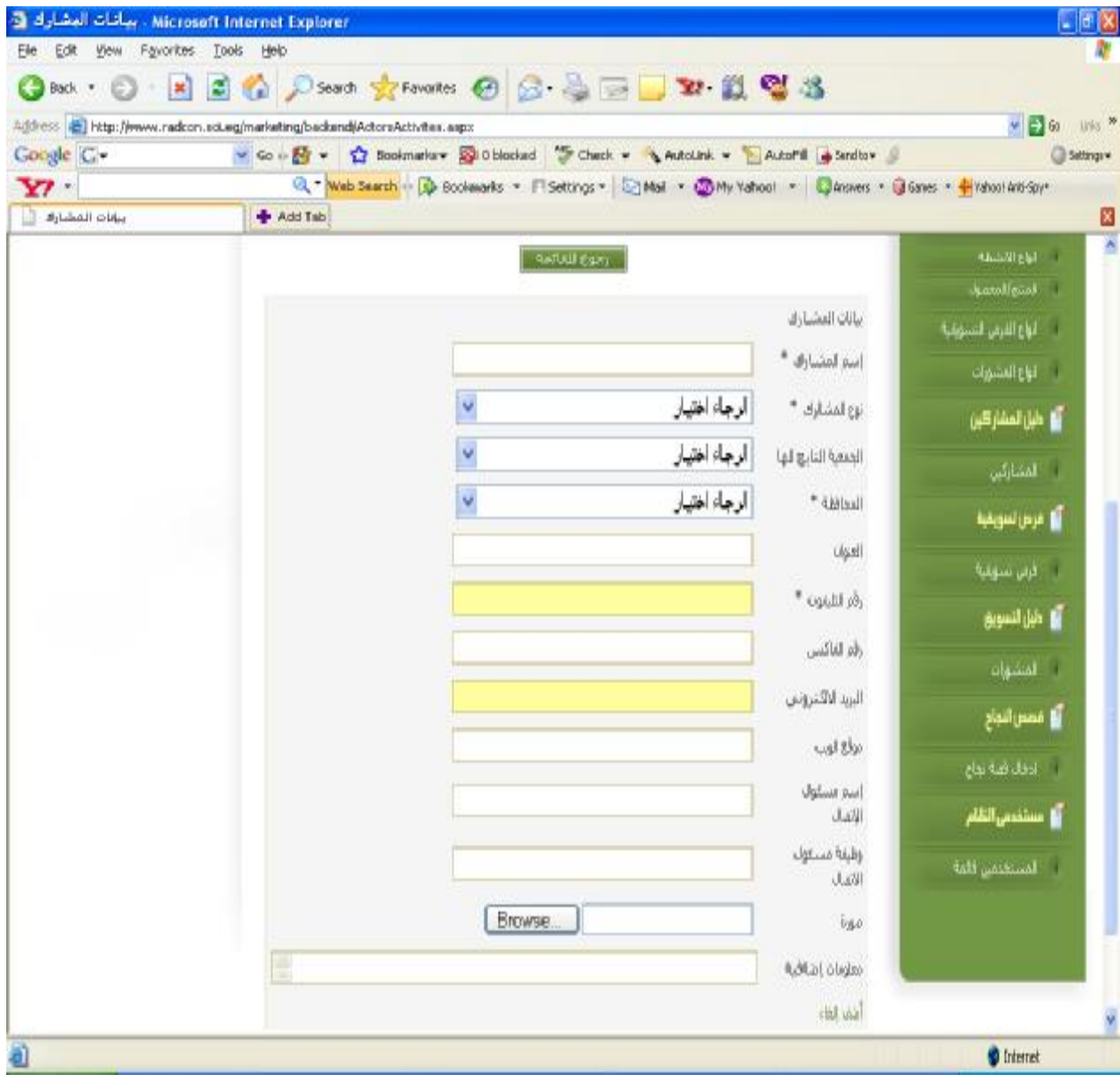


Figure 59_1. Member Data entry Screen

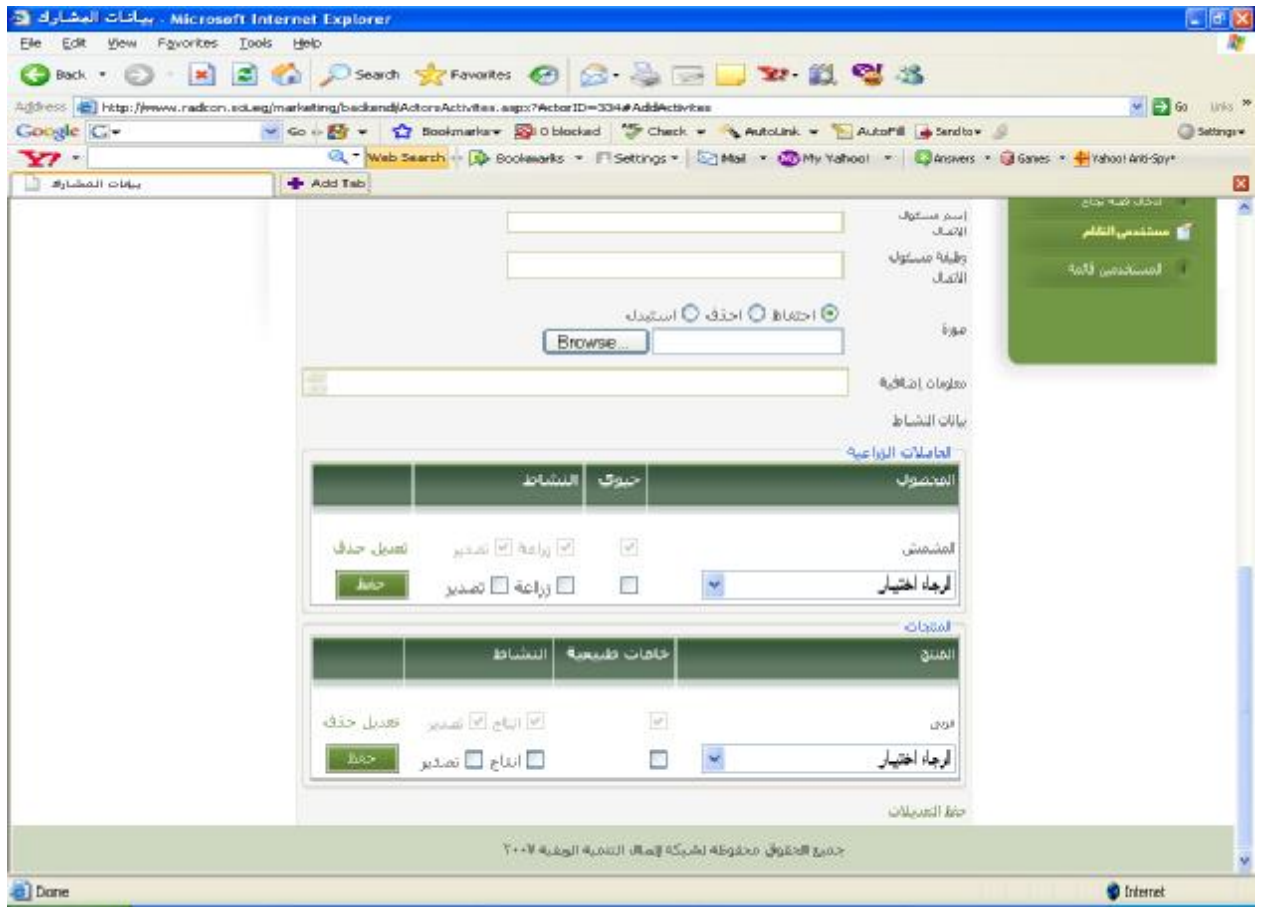


Figure 59_2. Member Data entry Screen

After entered all basic data, data entry can add member activity data. As shown in figure14, member activity data consists of *Product/Crop* name, type (organic or not, activity (growing and export for crops and producer and exporter for product).

As shown in figure 61, back-end user has different capabilities (Explore, Edit, Delete and publish (for approver only)).

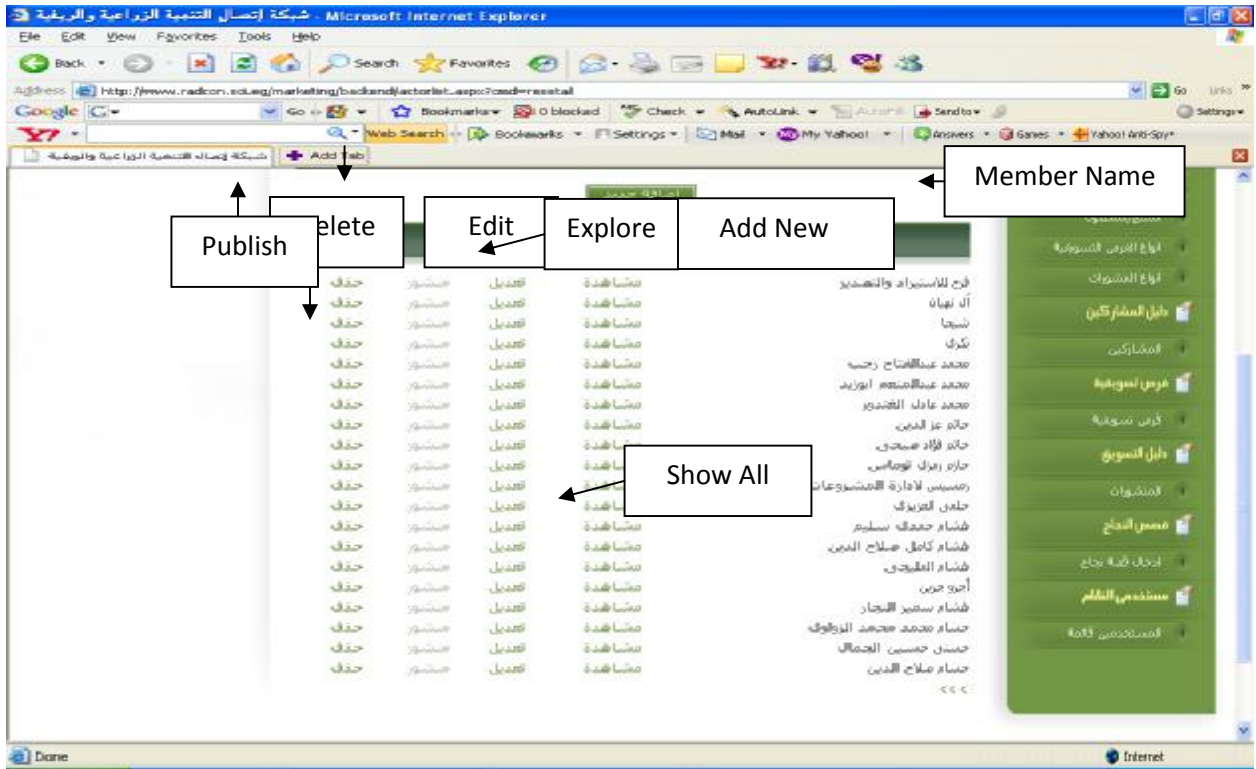


Figure 61. Editing Member Data Screen

- Marketing Oppourtunity Data

As shown in figure62, marketing oppourtunity data entry form consists of all needed information about marketing oppourtunities.

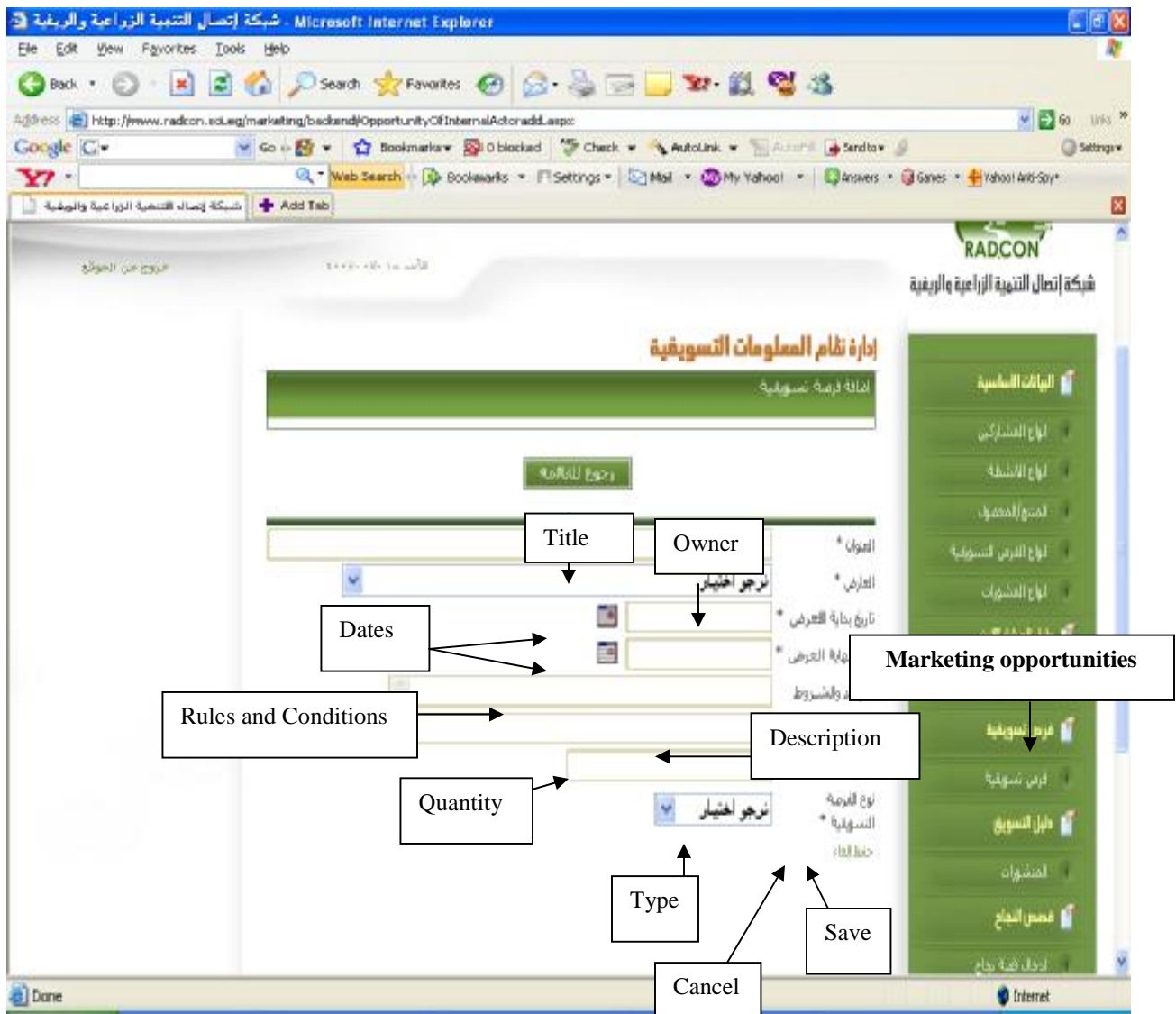
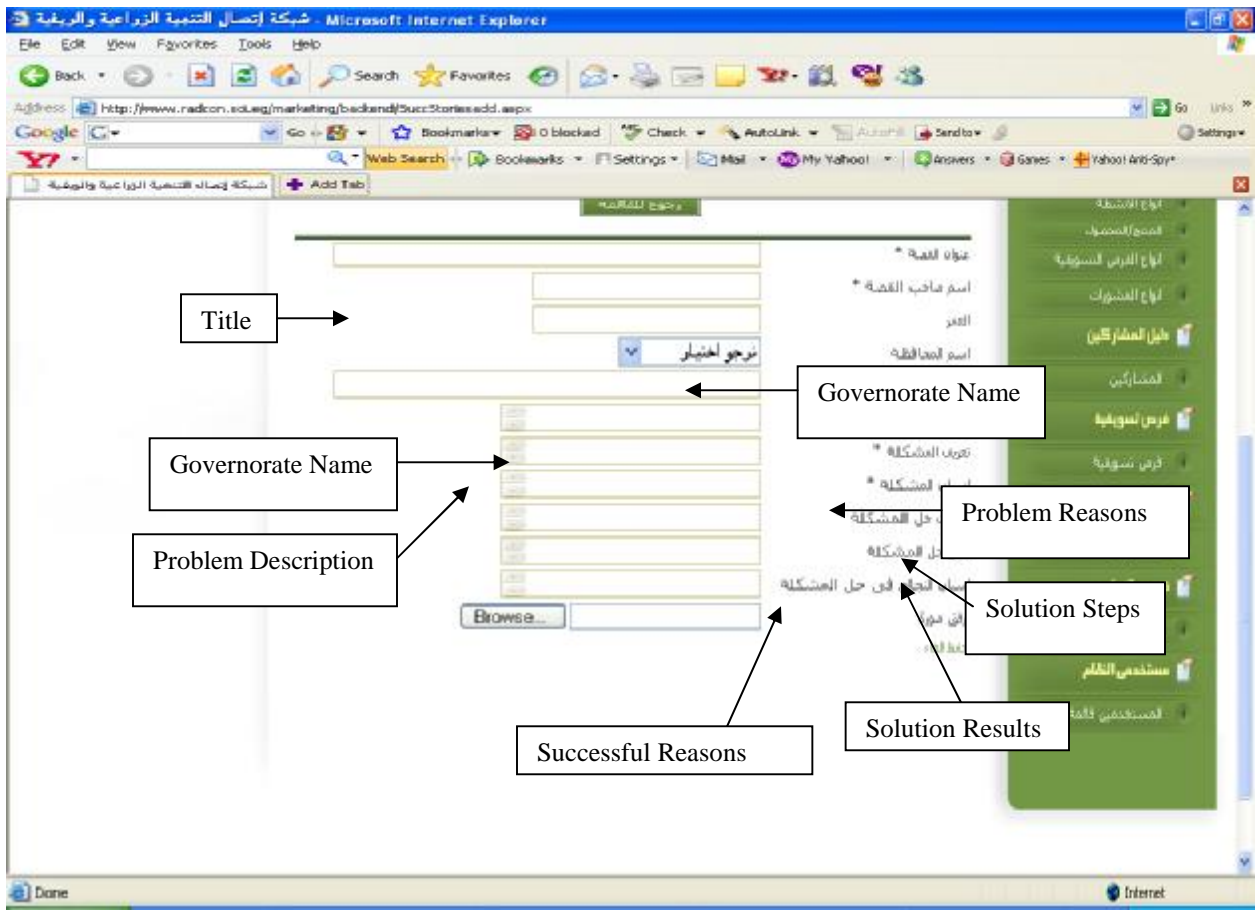


Figure 62. Opportunity Data Entry Screen

- Marketing Publications Data

As shown in figure18, marketing succesful stories data entry screens, data entry can complete all needed data that appears in the front-end.



Section Six. Testing Cases

6. 1. Graphical User Interface (GUI) Component and Usability Checklist

✚ General Features to be Tested are:

Go to the front-end and backend components browse all their pages and check:

- The same screens appear each time application is launched.
- Consistent and logical navigation flow.
- Uses of standard GUI features (e.g., pull-down menus, dialog boxes, toolbar buttons) and application windows have consistent look and feel.
- Data formats are consistent throughout application windows
- Menu options can be accessed via keyboard commands and/or arrow keys, following Microsoft conventions. Mouse-only access to options should be avoided.
- Controls on page must respond properly to Tab order and hot-keys (alt-keys). In Microsoft Windows, a user should be able to use the Tab key to move from one control to the next. This should work in a logical manner such as from left to right, or top to bottom.
- Interface RECOVERS gracefully from anticipated user errors (e.g., invalid input)
- Information and error messages are useful, accurate, and correctly spelled
- Unnecessary warnings do not appear .

✚ Handling Error Messages

The Tester should make sure to address these key questions:

- Are alphabetic or non-numeric data rejected when the user attempts to enter these as inputs to numeric data fields and vice versa?. Type checking should be performed on all data fields to prevent alphabetic or other non-numeric characters being accepted as valid data in numeric data fields.
Type checking should also be performed when reasonable to prevent numeric characters being accepted as valid data in alphabetic data fields. This is harder because, for instance, a text comment field might legitimately allow a number as part of a comment.
- Are warnings provided when data values or combinations of data are entered that may cause failure in the software's calculation process?
Software should also alert the user when values are entered that may cause the solution method to fail. Failures can include non-convergence, convergence to the wrong solution, or in extreme cases evaluation of a singularity.

6.2. All System Components

Error type	Output	Test Cases
<i>Backend Login and Logout</i>	<i>Login and Logout Errors</i>	<ul style="list-style-type: none"> Go to the back end Login by: <i>User Name: "Admin" and Password: "Omran"</i> as an example. Create a new data entry and approver. By using both users privilege, find out if it works when exit and rerun it again for several times.
<i>Usability</i>	<i>Usability Errors</i>	<p>Navigate through the all pages and find out the following:</p> <ul style="list-style-type: none"> Is it obvious to the user which actions are available to him? Is the web pages consistent from page to page, including font sizes and colors, adjust of displays, meaningful titles, meaningful buttons in name and actions, use the same language. If a user forgets to fill in a required field, is there a friendly error message and a change of the color of the field label to some other conspicuous color.
<i>Unit Testing</i>	<i>Functionality Errors</i>	<p>Apply random test cases that contains the following:</p> <ul style="list-style-type: none"> Valid data Invalid data. Field type (by trying value of wrong types for numeric field try nominal and visa versa). Range checking. (Field boundary).
<i>Load Testing</i>	<i>Load errors</i>	<p>Apply load testing (simulation):</p> <p><i>Data Flow Test</i></p> <ul style="list-style-type: none"> Login as a defined <i>Data Entry</i>. Fill the needed data to create a new record in each sub-module. Save record by clicking on the "save" button. Check if the systems automatically go to "show all data" page.

- If yes try to edit some fields and save it again.
- Browse the entered record and check that all entered data is appeared.
- Check that all buttons: “Edit” and “Delete” are appeared.
- Go to the front-end and check that this record not publish yet.
- Return again to the backend, enter as a defined approver.
- Check that: all entered record, from the associated data entry, is appeared and click on “publish” button.
- Go to the front-end and check if this record is published or not.

General Test Guide

- Make sure that numeric-only fields accept only numeric values
- Follow the tutorial/test cases, but then skip a step, or do them in a different sequence.
- Uninstall, then re-install in non-default directory/drive:
- Install in a non-default directory/drive
 - Click on the cancel button(s) during the installation process
 - Change the Program Folder that the shortcut in the Windows Start menu is going be located at, to make sure that the changes work
- Check online help features (include the buttons to open the help features).
- Check print feature
 - If there are logins, enter invalid login information for each field
- Check error messages for clarity. Check to make sure error message come up when they are supposed to.
- If there is a database, make sure all connections through

the applications are valid when accessing the data. For example, when the user pulls up a table in the application, a "could not connect" or similar types of errors should not occur.

- For databases, make sure single quotes and double quotes are tested to verify they do not corrupt the database.
- Modify the data files (such as adding an extra comma) to make sure the system gives a correct error message.
- For administrative features, make sure only administrators of the applications may access those features
- Add duplicate records.
- Delete all records to make sure it does not crash the application.
- Check with compatibility with Microsoft office applications
- Click all buttons to make sure they work
- Check Open File features
- Check all options available for some fields. And try to change fields' values randomly, and use different combinations of fields.
- Check for spelling within the applications
- Maximize, Minimize, and Resize windows to make sure the application responds correctly.

- Check all menu items, including pop-up menus that come up when the user right clicks an item.
- Measure how the system react to any input also how the output degrade for input degradation by applying the following cases:
 - For numeric fields, choose the minimum and maximum numbers.
 - For date fields, try very near date and very far date.

Robustness

Robustness Errors

