Palestine Polytechnic University College of Administration Science and Technology



"Home Finder System Using Information Visualization"

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Dedication

To those taught us throughout life: our parents, families,

teachers, and our colleagues.

To all of them say

"Thank You".

Acknowledgment

Completion of our project is the result of collective efforts of assorted individuals. My honest, thanks and gratitude to my supervisor Suzanne Sultan who is the best adviser and guider. I would like to thank Mr. Mahdi Atawneh and Mr. Anas Al sharabati for their kind support and assistance.

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Abstract

Searching for renting home is a difficult procedure that needs a lot of time and effort and the acquired information may be inadequate or not accurate. Besides, it's essential indispensable process for everyone. So, building web based home finder system using information visualization is required to facilitate searching home in a usable manner. By using home finder the home searcher can finds the available homes depending on entered home criteria. The system displays information in visual manner such as displaying homes on a map and using chart to help managers get specific information about homes. Home finer is built using Adobe Flex 4 and PHP scripting language.

الملخص

عملية البحث عن منازل للاستنجار هي عملية صعبة تحتاج إلى الكثير من الوقت والجهد. والمعلومات المكتسبة من الأشخاص قد تكون غير كافية أو غير دقيقة. إلى جانب ذلك ، فهي عملية مهمة للجميع لا غنى عنها. لذلك، من الضروري بناء مكتشف ويب للمنازل باستخدام تصوير المعلومات المرئية لتسهيل البحث في الصفحة الرئيسية بطريقة قابلة للاستخدام.

باستخدامها يمكن أن يجد المستخدم المنازل المتاحة اعتمادًا على المعابير التي يتم إدخالها من قبل المستخدم. ثم يعرض نظام المعلومات بطريقة مرئية المنازل التي تتوافق مع المعابير المدخلة على الخارطة واستخدام الرسم البياني لمساعدة المدير في الحصول على معلومات محددة حول المنازل. تم بناء الصفحة الرئيسية باستخدام Adobe Flex 4.

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Chapter 1 System planning

Introduction

Problem Statement

Objectives

Project Domain

Project Importance

System Development Stages

1.1 Introduction

Information Technology has had a great effect on the evolution in many fields such as, education, medical, industry, business and presenting services. Using computer technology to gain competitive advantage in the modern business and presenting services such as giving information about renting homes.

This chapter will be about the problem statement, which explains the problem of the routine searching for homes. Second, the system objectives, which are about the main goal of the system. Third, the project scope, which shows the homes, will cover in which domain. Fourth, the project importance, which explain that benefits that we get from the home finder system. Finally, we put table of tasks that contains each task we did in an expected time.

1.2 Problem statement

Usually when we need home for renting we ask our neighbors, friends and others. Did they give us exact information about it? We don't know, but usually this information is not reliable and accurate, did they give us the exact price, site, room number and its difficult to imagine it from oral description? So that makes the customer more confused, where I go? How I know where is the home? Who's the renter? And how can I see it? All of that takes from us effort and searching time.

1.3 Objectives

The main goal is to create free automatic interactive service system using information visualization such as maps ,charts and images, which helps people to find homes for renting according to specific criteria, like room number, price, address (location) and others. Also the system aims to display home video.

1

1.4 Project domain

The system will serve the people to find homes for renting in Hebron city only. The homes classified according to some criteria's the user choose it.

1.5 Project importance

The importance of the project appears in following points:

- Saving time and effort, in the search process for a variety and different houses.
- Using interactive and reliable system.
- learn ability (easy to learn):
 - o By using clear navigation.
 - Achieve usability system by following usability guidelines in developing system, such as designing usable interface.
 - Our system contains images, which are easier to grasp and understanding rather than texts.

1.6 System development stages

Every project needs a set of tasks carried out in stages .we will display the stages using textual description, table based and chart based (Gantt chart)

1. Collecting information and planning:

Collect information about the Topic, so we read some books such as"
Information Visualization Perception for Design", and "Introduction to Information
Visualization" book. Also we read papers such as information visualization for Chen,
2002. Moreover we conduct research on the Internet such as
www.cs.umd.edu/hcil/research/visualisation.shtml.

2. System requirement:

Determine the functional and non-functional requirements for the system in abstract manner, and find alternative systems and choose the best to be our project. We will also recall some of the risks that faced the systems developers.

3. requirement specification:

After we mentioned the system requirements, we will analyze the functional requirements and drawing models that depict the functional requirements by details, charts and diagrams.

4. System design:

In this stage, we will design the system element and database that will be used .

5. System implementation:

After the design process we will program the system.

6. System testing:

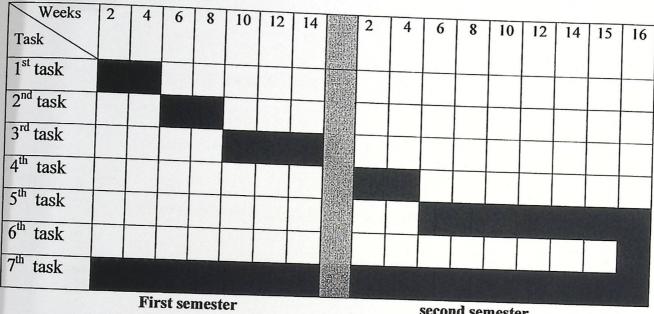
In this stage, testing must be accompanying to system implementation to chick the units of the code or to chick the entities system.

7. system Documentation:

Documentation will be continued from the beginning to end of the system development.

tasks	Description	weeks
1 st task	Collecting information and planning	4
2 nd task	System requirement	4
B rd task	requirement specification	6
th task	System design System implementation	2
th task	System testing	15
th task	system Documentation	32

Table 1. 1: Time division task



second semester

Figure 1. 1: Expected Gant Chart

Expected

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Weeks	2	4	6	8	10	12	14	MAN A									
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Figure 1. 2: Actual Gant Chart

Actual time.

Chapter 2 Background

Introduction

Definition of Information Visualization
Information Visualization Advantages
Information Visualization Applications
Information Visualization Techniques
Information Visualization Environments

2.1 Introduction

As time goes by, a lot of incidents is going to take place within our daily life but there is a station we must stop at to have it all considered like emails, credit card information and movement and other information. We cannot absorb it at all nor save it in our mind for a long time. Because of that we used visualization that we will talk about and explained through this chapter.

The field of information visualization is a very new science. Since the beginnings of 1980s. The modern study of visualization started with computer graphics, which has from its beginning been used to study scientific problems. Information visualization presumes that visual representations and interaction techniques take advantage of the human eye's broad bandwidth pathway into the mind to allow users to see, explore, and understand large amounts of information at once. Information visualization focused on the creation of approaches for conveying abstract information in intuitive ways.

2.2 The definition of information visualization:

Visualization: is constructing a visual image in mind, it's more like to a graphical representation of data or concept on your mind. (Oxford English dictionary.1989)

Information visualization: "is the use of computer-supported system, to visualize the Representations of abstract data to simplify cognition, and interacting with it." (Information visualization introduction to design, 2007)

Other definitions that may be more user-friendly include: "the process of analyzing and transforming non-spatial data into an effective visual form. The transformation of abstract data to a visual representation, which is rapidly understood by the user; and the visual appearance of data objects and their relationships". (Information visualization introduction to design, 2007)

2.3 Information visualization advantage:

Information visualization has many advantages such as:

- Visualization provides the ability to comprehend huge amounts of data by a human observer very easily and very quickly. So the important information is immediately available from more than one million measurements.
- Visualization allows the perception of emergent properties that were not expected.
- Visualization also facilitates understanding of both large-scale and small-scale data features.
- Visualization frequently enables problems with the data itself to become
 immediately obvious. Visualization usually reveals things not only about the
 data itself, but about the way it is collected. With an appropriate visualization,
 errors in the data often jump out at you. For this reason, visualizations can be
 very useful in quality control.

2.4 Information visualization Applications

Information visualization application areas: (Bin. Z & Chen.H(2004). Information Visualization .Boston University, MA, USA)

1. Visual Data Mining

Information visualization techniques can influence the data mining process By providing a platform for understanding data, and generating hypotheses about the data. And that based on human capabilities such as domain knowledge, perception, and creativity. Here some benefits of using information visualization in data mining:

- Identifying patterns that a data mining algorithm might find difficult to locate.
- Supporting interaction between users and data.
- Supporting interaction with the analytical process and output of a data mining system.

2. Digital Library Visualization

Browsing a Digital Library

It's used to retrieve information when a user does not have a specific goal, when he doesn't know he searching for what. Visualization supports browsing by providing an effective overview that summarizes the contents of a collection in a class. So there is two ways to browse for something:

Browse by subject hierarchy:

Cancer Map system: which it allows for users that they don't know what they want, to see any information they seek for it in a different blocks. In which it make the user recognizing what he wants very easy and very quickly.

• Browse by geographical locations:

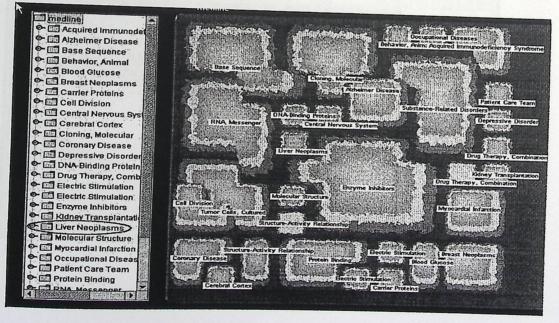


Figure 2. 1: Cancer Map

2.5 Information Visualization techniques

The following are examples of some common visualization techniques: (Bin. Z & Chen.H(2004). Information Visualization. Boston University, MA, USA).

1. table, matrix

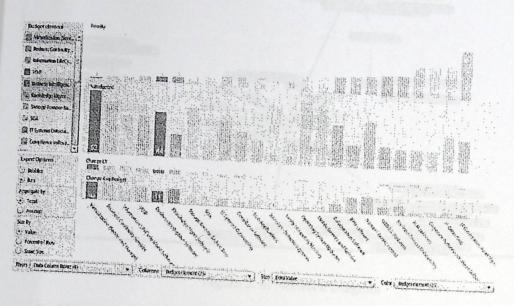


Figure 2. ¹:Table Visualization (Bin. Z & Chen.H(2004).

2. Charts (pie chart, bar chart, histogram, function graph, scatter plot, etc.)

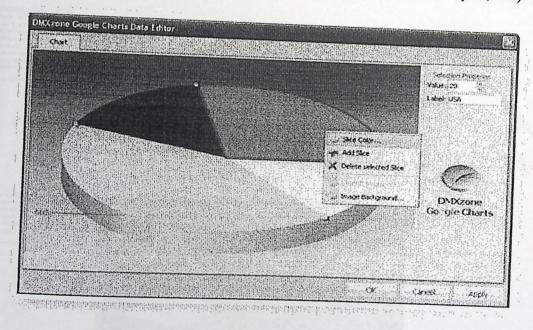


Figure 2. 3: Chart Visualization

3. Graphs (tree diagram, network diagram, flowchart, existential graph, etc.)

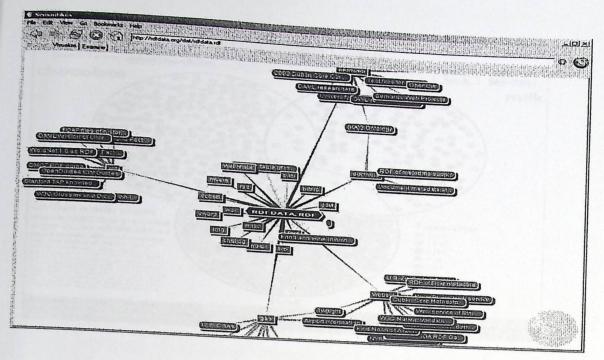


Figure 2. 4: Network Diagram

4. Maps

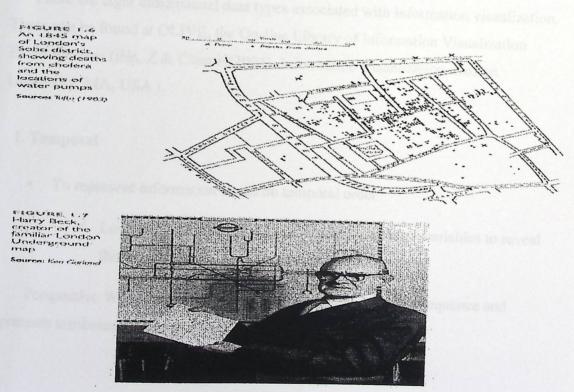


Figure 2. 5: Map Graph

5. Venn diagram

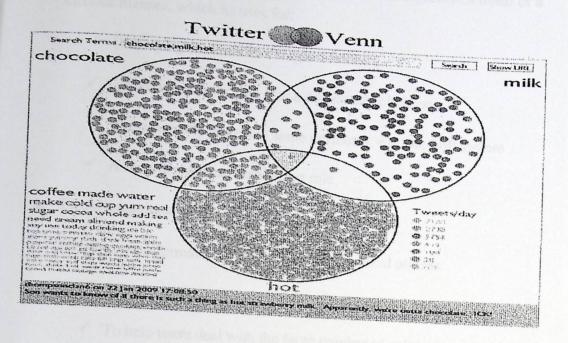


Figure 2. 6: Ven Graph

Information visualization environments:

There are eight dimensional data types associated with information visualization. These can be found at OLIVE, the On-line Library of Information Visualization Environments: (Bin. Z & Chen.H(2004). Information Visualization. Boston University, MA, USA).

1. Temporal

- To represent information based on temporal order
 - ✓ Location and animation are commonly use visual variables to reveal the temporal aspect of information ,for Example:

Perspective Wall lists objects along the x-axis based on time sequence and presents attributes along the y-axis.

2. One-dimensional (1D)

- To represent information as one-dimensional visual objects in a linear or a circular manner, which its uses for:
 - ✓ Displaying contents of a single document.
 - ✓ providing an overview for a document collection
 - ✓ Colors usually represent some attributes, e.g. See Soft system
 - ✓ A second axis may also play a role.

3. Two-dimensional (2D)

- To represent information as two-dimensional visual objects.
 - ✓ Visualization systems based on self-organizing map (SOM)
 - ✓ To help users deal with the large number of categories created for the mass textual data.

4. Three-dimensional (3D)

- To represent information as three-dimensional visual objects, for example:
 - ✓ Web Book system folds web pages into three-dimensional books
 - ✓ 3-D version of a tree or network.

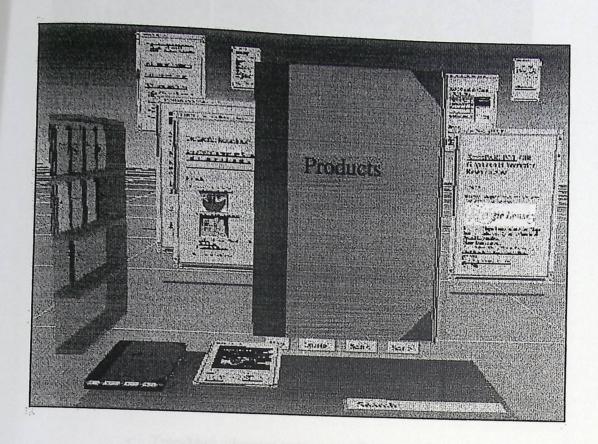


Figure 2. 7: 3D Environment

Multi-dimensional (MultiD)

 To represent information as multidimensional objects and projects them into a three-dimensional or a two-dimensional space, we need for Dimensionality reduction algorithm.

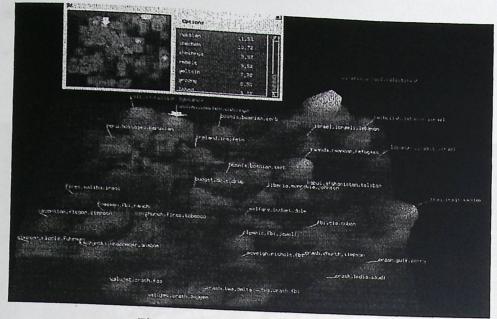


Figure 2. 8: Milti Model Environment

5. Trees

- Used to represent hierarchical relationship
 - Examples
 - Tree-Map allocates space according to attributes of nodes

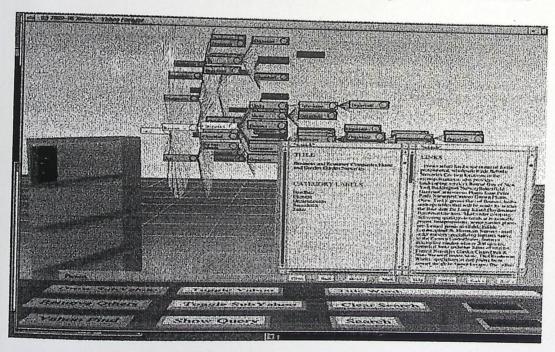


Figure 2. 9: Tree Envitonment

6. Network

 To represent complex relationships that a simple tree structure is insufficient to represent. Like Documents that linked by the internet.

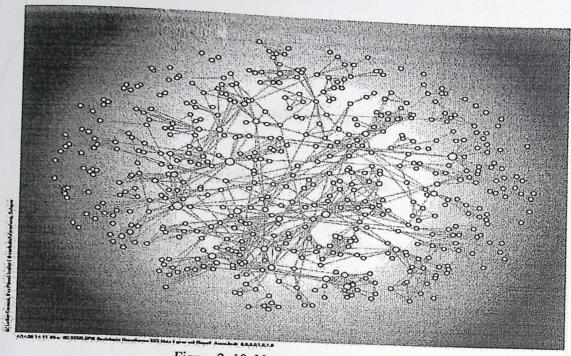


Figure 2. 10: Network Environment

Chapter 3 System Requirements

Introduction

Questioners Analysis

Description of Functional Requirement

Use Case Diagram

Sequence Diagram

3.1 Introduction

In order to solve the problem statement that is talked about in the first chapter, several alternatives will be discussed in this chapter. Indeed, we judge against different alternatives to get optimal solution. Finally, we will argue the system requirements of the proposed system. System requirements are divided into two portions: functional and nonfunctional requirements.

3.2 Alternatives

Our system approach is to convert the manual searching for homes into electronic system. In order to facilitate the searching operation for home, there are four alternatives.

3.2.1 Desktop using textual representation system

This system is used in the real estate desktop office, where the customer come to the office, to find homes for renting ,but this system shows the information in textual representation (words, table).

3.2.2 Desktop with visual representation

As before the system is used in the real estate office, where the customer come to the office, to find homes for renting, but this system shows the information in a visual way.

3.2.3 Web with textual representation

This system is a web application designing for home renting. The user can find home for renting through choosing some criteria. All user can deal with the system remotely, but this system shows the information in text or tables.

3.2.4 Web with visualization

As in previous system it is a web application system, which is designed for home renting. The user can find home for renting through choosing some criteria. The system shows the information in a visual representation.

Alternative Advantages and Disadvantages 3.3

In order to choose the best solution, we mentioned in the table below the advantage and disadvantage for each alternative.

Alternatives	Advantages	Disadvantages
	1. Easy to develop and build.	If the data is overcrowded and
Desktop using textual representation system	2. Centralized data. This mean it's restructured from one place and one person. So that makes it more secure and easy to backup.	illustrated in one screen will makes the user more confused, so he cannot perceive it and can't compare it.
	Walky butulance interface that resemble maps	2. It's difficult to pick the needed information from dense information, because the displayed
Wich with lexibal	L. Avadable 24 hours a day. 3 days a week.	information using test or tables.
Desktop with visual representation	1. The displaying result is easy to be perceived by using information visualization in spite of the dense of textual representation.	Take time to develop because of using visualization.

	2. Centralized data. This mean it's restructured from one place and one person. So that make more secure and easy to backup.	
Desktop with visual representation	3. Easy to learn, using information visualization.	down, the web page will not be available.
	4. Attractive to be used, by using intuitive interface that resemble maps.	Falke time and effort to develop.
	2. Easy to learn, by using	2. Difficult as accurately determine
Web with textual representation	 Available 24 hours a day, 7 days a week. Updates can be made quickly and easily. 	1. If the data is overcrowded and illustrated in one screen will makes the user more confusing, so he cannot perceive it and compare it with the other information
1656 3, 178	unions arteringes and disadvanages is	otbliky abacy

In this section, we will discuss several costing in order as follow:

- Development cost
- Operational cost

Each cost includes hardware cost, software cost and human resource cost and another cost.

3.3.1 The first alternative: Desktop with textual representation

✓ Development cost:

Which include hardware cost, software cost, human cost and others costs.

1. Hardware cost:

The table below illustrates the cost of hardware resource for the system development:

Element	Ilmito manual		
	units number	Unit cost	Total cost
Computer	1	600\$	600\$
Printer	1	400\$	400\$
Flash memory(4GB)	1	10\$	10\$
	Total		1010\$
Table 3 2-Har	dware Costs of System		1010\$

Table 3. 2:Hardware Costs of System Development (www.amazon.com)

2. Software cost:

The table below shows the software costs of the system development:

Element	Units number	Unit cost	Total cost
Microsoft windows 7 ultimate	1	200\$	200\$
Microsoft office professional 2007	1	150\$	499.95\$
Visual Studio 2005	1	200\$	744\$
Photoshop	1	100\$	100\$
dopica	1	Free	Free
Tota	1543.95\$		

Table 3. 3:Software Cost of System Development

3. Human resource cost:

The team project consists of three members that exchange their roles to implement this project. The table below shows the human cost for the system development:

Name	Week/hour		cost
Developer 1	30	Cost/hour	Total/month
Developer 2	30	10\$	1200\$
Developer 3	30	10\$	1200\$
		10\$	1200\$
Total Table 3. 4: Human Cost of Start			3600\$

Table 3. 4: Human Cost of System Development.

4. Another costs:

There are extra costs are needed such as (transportations, papers, printing and pens, consultation....etc) there is 200\$ needed to cover it.

✓ Operational cost:

1. Hardware cost:

The following table lists the costs for the hardware required to operate this project:

Hardrage	Element	Unit numb	er Un	it cost	Total cost
computer	Manuaces .	2	600\$		1200\$
	STURES CO	Total			1200\$

Table 3. 5: Hardware Cost of Operating System.(www.amazon.com)

2. Software cost:

The table below shows the cost of software resources:

Element	Unit License number License cost			
	number	Zieense number	License cost	Total
Microsoft windows 7	1	3		cost
ultimate		3	200\$	600\$
Visual Studio 2005	1	3		
	Tr		391\$	1173\$
Table 3. 6: Sof	Tota	Operating South		1773\$

Table 3. 6: Software Costs of Operating System (www.amazon.com)

3. Human resource cost:

The human resources include the following person in order to operate the system.

Total human cost for administrator 250\$.

4. Other costs:

Other cost that needed to operate the system, there is another 0.5\$ to cover the CD's cost.

Total costs of system development for the first alternative:

Resources	Costs	
Hardware resources development cost	1010\$	
Software resources development cost	1543.95\$	
Human resources cost	3600\$	
Other resources cost	200\$	
Fotal	6353.95\$	

Table 3. 7: Total Development System Cost

Total cost for operational system:

Resource	Cost	
Hardware resources operational cost	Cost	
	1200\$	MATHER TO
Software resources operational cost	1773\$	Total cost
Human resources cost	1773\$	
	250\$	20813
Other resource cost	10\$	1 899 955
Total	100	11 100
A SAME AND A SAME AS	3233\$	2.1.2.1.4.9.00

Table 3. 8: Total Operating System Cost.

We summarized the cost for the first alternative:

st Operational cost
Operational cost
AND THE RESIDENCE OF THE PARTY
1200\$
1773\$
1775\$
250\$
100
10\$
3233\$

Table 3. 9: Total Cost for the 1st alternative.

3.3.2 The second alternative: Desktop with visualization representation

✓ Development cost:

Which include hardware cost, software cost, human cost and others costs.

1. Hardware cost:

The table below illustrates the cost of hardware resource for the system development:

Element	units number	Unit cost	Total cost
Computer	1	600\$	600\$
Printer	1	400\$	400\$
Flash memory(4GB)	1	10\$	10\$
Total			1010\$

Table 3. 10: Hardware Costs Of System Development

2. Software costs:

The table below shows the software costs of the system development:

Microsoft windows 7 ultimate	Units number	Unit cost	Total cost
Microsoft office professional 2007	1	200\$	200\$
Adobe flex	1	150\$	499.95\$
Visual Studio 2005		200\$	31.49\$
Photoshop	1	200\$	744\$
dopica	I have so the t	100\$	100\$
		Free	Free
Total			1575.44\$

Table 3. 11: Software Cost of System Development.

3. Human resource cost:

The team project consists of three members that exchange their roles to implement this project. The table below shows the human cost for the system development:

Name	Week/hour	Cost/hour	Total/month
Developer 1	30	10\$	1200\$
Developer 2	30	10\$	1200\$
Developer 3	30	10\$	1200\$
	Total		3600\$

Table 3. 12: Software Cost of System Development.

4. Another costs:

There are extra costs are needed such as (transportations, papers, printing and pensile, consultation....etc) there is 200\$ needed to cover it.

✓ Operational cost:

1. Hardware cost:

The following table lists the costs for the hardware required to operate this system:

Element	Unit number	IImi4	
computer	2	onit cost	Total cost
		600\$	1200\$
	Total	17735	1200\$
Human rescurse a	Table 3 12: Hard		1200\$

Table 3. 13: Hardware Cost of Operating System.

Software cost:

The table below shows the cost of software resources:

Element	Unit number	License number	License cost	Total
Microsoft windows 7	1	2		cost
ultimate	10102	3	200\$	600\$
Visual Studio 2005	1	3	391\$	1173\$
Hurtan rozamor	Tota	I	303	1773\$

Table 3. 14: Software Costs for Operating System

2. Human resource cost:

The human resources include the following person in order to operate the system:

Total human cost for administrator 250\$.

3. Other costs:

Other costs that needed to operate the system, there is another 0.5\$ to cover the CD's cost.

Total costs of system development for the second alternative:

23001162	second afternative:
Costs of hardware resources development	Costs
Costs of software resources development	1010\$
Costs of human resources development	1575.44\$
Costs of human resources development	3600\$
Costs of other resources	200\$
Total	
Table 3. 15: Total David	6385.44\$

Table 3. 15: Total Development System Cost.

Total cost for operating system:

Resource	Cost	dal engl
Hardware resources operational cost		
	1200\$	
Software resources operational cost	1773\$	1998
Human resource cost	250\$	5
Other resource cost	230\$	
	50\$	
Total	3273\$	
Table 3, 16: Total C		

Table 3. 16: Total Operating System Cost.

We summarized the costing for the second alternatives:

Donat	
Development cost	Operational cost
1010\$	1800\$
1575.44\$	1773\$
3600\$	250\$
200\$	50\$
	3273\$

Table 3. 17: Total Cost for the 2nd alternative.

3.3.3 The third alternative: Web with textual representation

✓ Development cost:

Which include hardware cost, software cost, human cost and others cost.

1. Hardware cost:

The table below illustrates the cost of hardware resource for the system development:

Element	units number	Unit	
computer	1	Unit cost	Total cost
Printer	1	600\$	600\$
Flash memory(4GB)	1	400\$	400\$
	Total	10\$	10\$
Tabl	e 3. 18: Hardware Cos	etc of C	1010\$

Table 3. 18: Hardware Costs of System Development.

2. Software costs:

The table below shows the software costs of the system development:

	Units number	Unit cost	
Microsoft windows 7 ultimate	1	omit cost	Total cost
		200\$	200\$
Microsoft office professional 2007	1	1500	17 18
Visual Studio 2005		150\$	499.95\$
		200\$	744\$
Photoshop	1	1000	
Hosting Cost		100\$	100\$
	1	150\$	150\$
Domain Name Cost	1		
ADSL Line	•	150\$	150\$
ADSL LINE	1	100\$	100\$
dopica	1		λ.ΟΟΦ
	1	Free	Free
Tota	l	30403	1943.95\$

Table 3. 19: Software Cost of System Development.

3. Human resource cost:

The team project consists of three members that exchange their roles to implement this project.

The table below shows the human cost for the system development:

Name	Week/hour	Cost/hour	Total/month
Developer 1	30	10\$	1200\$
Developer 2	30	10\$	1200\$
Developer 3	30	10\$	1200\$
	Total		3600\$

Table 3. 20: Human Cost of System Development.

4. Another cost:

There are extra costs are needed such as (transportations, papers, printing and pens, consultation....etc) there is 200\$ needed to cover it.

✓ Operation cost:

1. Hardware cost:

The following table lists the costs for the hardware required to operate this system:

Element	Unit number	TI	
computer	and addition	Unit cost	Total cost
	2	600\$	1200\$
Internet (DSL Modem)	1	1000	1200\$
		100\$	100\$
	Total		1300\$

Table 3. 21: Hardware Cost of Operating System.

2. Software cost:

The table below shows the cost of software resources:

Element	Unit number	License number	License cost	Total
Microsoft windows 7	1	3	200\$	cost
ultimate	Comiced	364.65	2004	000\$
Visual Studio2005	1	3	391\$	1173\$
Hosting Cost	1	1	150\$	150\$
Domain Name Cost	1	1	150\$	150\$
ADSL Line	1 3 20 1011	1 skeptess system	100\$	100\$
	Total			2173\$

Table 3. 22: Software Costs for Operating System.

3. Human resource cost:

The human resources include the following person in order to operate the system:

Total human cost for administrator 250\$.

4. Other costs:

Other costs that needed to operate the system programs, there is another 0.5\$ to cover the CD's cost.

Total cost for operational system:

Cost	
1300\$	
2173\$	
250\$	
3773\$	
	Cost 1300\$ 2173\$ 250\$ 50\$

Table 3. 23: Total Operating System Cost.

Total costs of system development for the third alternative:

Resources	Costs
Hardware resources development cost	1010\$
Software resources development cost	1943.95\$
Human resources development cost	3600\$
Other resources cost	200\$
Total	6753.95\$

Table 3 .24: Total Development System Cost.

We summarized the cost for the third alternative:

Resource	Development cost	1005
Hardware resource	1010\$	Operational cost
Software resource	1943.95\$	1300\$
Human resource	3600\$	2173\$
Other resource	200\$	250\$
Total	6753.95\$	50\$
Ta	ble 3. 25: Total Cost for the 2-d	3773\$

able 3. 25: Total Cost for the 3rd alternative.

3.3.4 The forth alternative: Web with visual representation

✓ Development cost:

Which include hardware cost, software cost, human cost and others cost.

1. Hardware cost:

The table below illustrations hardware resources for system development:

Number unit		development.
Trambel and	Cost unit	Total cost
1	600\$	600\$
1 state assisted in	400\$	400\$
1) 42400 is 2005 is	10\$	10\$
Total		1010\$
	Number unit 1 1 1	1 600\$ 1 400\$ 1 10\$

Table 3. ٢٦: Hardware Costs of System Development

2. Software costs:

The table below shows the software costs of the system development:

Element	Units number	Unit cost	Total cost
Microsoft windows 7 ultimate	1	200\$	200\$
Microsoft office professional 2007	1	150\$	499.95\$
Adobe flex	1	200\$	31.49\$
Visual Studio2005	1	200\$	744\$
Photo shop	1	100\$	100\$
Hosting Cost	1	150\$	150\$
Domain Name Cost	1	150\$	150\$

ADSL Line	
adopica 1 100\$	100\$
Total	Free
Table 3. 27: Software Cost of System 7	1975.44\$

Table 3. 27: Software Cost of System Development.

3. Human resource cost:

The team project consists of three members that exchange their roles to implement this project. The table below shows the human cost for the system development:

Name	Week/hour	C 15	1.0003
Developer 1		Cost/hour	Total/month
	30	10\$	1200\$
Developer 2	30	10\$	
Developer 3	30		1200\$
	30	10\$	1200\$
	Total		
	Table 3, 28: Human 6		3600\$

Table 3. 28: Human Cost of System Development.

4. Another cost:

There are extra costs are needed such as (transportations, papers, printing and pens, consultation....etc) there is 200\$ needed to cover it.

Total costs of system development for the fourth alternative:

Costs	1.003
1010\$	12179
1975.44\$	
3600\$	
200\$	
6385.44\$	sie die
	1010\$ 1975.44\$ 3600\$ 200\$

Table 3. 29: Total Development System Cost.

✓ Operation cost:

5. Hardware cost:

The following table lists the costs for the hardware required to operate this system:

Element	Unit number	Timit	
computer	3	onit cost	Total cost
Internet (DSL Modem)	1	600\$	1800\$
,	The state of the s	100\$	100\$
Tobl	Total	435	1900\$

Table 3. 30: Hardware Cost of Operating System

6. Software cost:

The table below shows the cost of software resources:

Element	Unit number	License number	License cost	Total
Boltonio resences de	eleginam enst	1975.445		cost
Microsoft windows 7 ultimate	1 when to car	3	200\$	600\$
Visual Studio2005	1	3	391\$	1173\$
Hosting Cost	163.33 Total	Aveloped the system	150\$	150\$
Domain Name Cost	1	1	150\$	150\$
ADSL Line	1	1 security at	100\$	100\$
	Total	est son	ANCHARLACE A	2173\$

Table 3. 31: Software Costs for Operating System

7. Human resource cost:

The human resources include the following person in order to operate the system:

Total human cost for administrator 250\$.

8. Other cost:

Other cost that needed to operate the system programs, there is another 0.5\$ to cover the CD's cost.

Total cost for operational system:

Resource	Cost
Hardware resources operational cost	
	1900\$
Software resources operational cost	2173\$
Human resource operational cost	
	250\$
Other resource operational cost	50\$
Total	
Table 3 32: Total 6	4373\$

Table 3. 32: Total Operating System Cost.

Total costs of system development for the fourth alternative:

Costs
1010\$
1975.44\$
3600\$
200\$
6785.44\$

Table 3. 33: Total Development System Cost.

We summarized the cost for the forth alternative:

Resource	Development cost	Operational cost
Hardware resource	1010\$	1900\$
Software resource	1595.44\$	2173\$
Human resource	3600\$	250\$
Other resource	200\$	50\$
Total	6785.44\$	4373\$

Table 3. 34: Total Cost for the 4th alternative.

We summarized the cost for the all alternative:

All Alternatives	Devel	
Desktop with textual representation	Development Cost	Operational Cost
Desktop with visualization	6353.95\$	3233\$
representation	6385.44\$	3273\$
Web with textual representation	6753.95\$	
Web with visual representation	6785.44\$	3773\$
Table 3. 35: Total C		4373\$

Table 3. 35: Total Cost for the all alternative.

Optimal solution:

After our study of each of the alternative systems in all respects. It's clear that the fourth alternative it's the more expensive but in order to meet the user need one we found the best to choose a web visualization system for the following reasons:

- Using the web will make the system available 24 hours, seven days a week.
- Using Information visualization focused on the creation of approaches for conveying abstract information in intuitive ways.
- Ability gives immediate feedback of the results.
- Increase effectively and decreasing time and effort

3.4 **Functional requirements**

Functional requirements determine what the system does? Or in other words it defines specific behavior or functions. the functional requirement of the proposed system done by three different categories of users:

- System administrator.
- Home owner.
- Renter users.

Requirements definition

- System administrator requirements
- 1. Check home information reliability manually
- 2. Make different operations in database related to home and user such as:
 - a. Adding new home.
 - b. Adding user.
 - c. Updating user: enables in case of appearing a new obligation and new user information that needed to update.
 - d. Updating Home: enables in case of appearing a new obligation and new home information that needed to update.
 - e. Delete user: enabled in a case of user death.
 - f. Delete home: enabled in case of demolishing the house.
- 3. Update his password.
- 4. Viewing a chart that defines some important data, which is one of the technique that is used to visualize information.

• Home owner requirements

- 1. Filling and sending the home information to the administrator.
- 2. Viewing charts that defines time of clicked for a specific houses.
- 3. Make different operations related to his home information and his information to the database:
 - a. Update User: enables in case of appearing a new obligation and new user information that needed to update.
 - b. Update Home: enables in case of appearing a new obligation and new home information that needed to update.

c. Delete Home: enabled in case of demolishing the house

• Renter requirements

- 1. Choosing the home criteria.
- 2. Display the home information and video, depending on a map. and this is one of the techniques used to visualize information.
- 3. Viewing a collection of photos for homes and displaying its information.
- 4. Displaying Hebron map to know more about the city areas in order to rent homes in area they prefers.

3.5 Nonfunctional requirements

Functional requirements define the behavior and the function of the system, whilst, the nonfunctional system specifies criteria that can be used to judge the operation of a system, rather than specific behaviors.

Which is a collection of known standards and by these standards we can develop the system, and develop some properties changed on the system.

Ease of usage

Clear interfaces, expressive icons, ease navigation screens, and some visualization techniques, assist people to help themselves to do what you want them to do. So in this way we will achieve ease if usage.

· Symmetry and harmony

Symmetry is beautiful, and leaded to harmony. In order to achieve it we will Use the same skin in all screens and the same button positions.

Our system will achieve accuracy, by checking the home and the owner information reliability and accuracy from Hebron City Hall.

3.6 Risks and risk analysis for the system

There is no system built without problems, even our system. So in this section we will take about the risks and limitation that faces the developer while developing it. Also we will take about some expected solution to solve these problems, which are mentioned in the tables bellow.

Limitation	Solution	
Disagreement between team members. Also not finishing within the determined period.	 Distribute the tasks between the team. Doing schedule to determine in it the date of finishing some tasks. The period between each meeting not very long. 	
2. Analyzing the system is not sufficient, because of propping new requirement.	,	
3. The budget will be exceeded than the determined.	Planning the tasks within the budget.	

Table 3. 36: limitation and solutions

Our system will achieve accuracy, by checking the home and the owner information reliability and accuracy from Hebron City Hall.

3.6 Risks and risk analysis for the system

There is no system built without problems, even our system. So in this section we will take about the risks and limitation that faces the developer while developing it. Also we will take about some expected solution to solve these problems, which are mentioned in the tables bellow.

Limitation	Solution
Disagreement between team members. Also not finishing within the determined period.	 Distribute the tasks between the team. Doing schedule to determine in it the date of finishing some tasks. The period between each meeting not very long.
2. Analyzing the system is not sufficient, because of propping new requirement.	Training continuously, and learning everything that the
3. The budget will be exceeded than the determined.	system need.Planning the tasks within the budget.

Table 3. 36: limitation and solutions

Power outages Losing or damaging the backup copy	Solution Having UPS, or motor for providing electricity. Making more than one copy
3. Server shutdown	Making the system works automatically in another server.
Table	3 37: riples - 1

Table 3. 37: risks and solutions

Chapter 4 Requirements specification

Introduction

Alternatives

Feasibility

Functional Requirements

Non Functional Requirements

Limitations and Risk Analysis for the System

4.1 Introduction

Collecting information is vital process to get clear understanding about the nature of proposed system. In order to get information about the most important home criteria that the user looks for, questionnaire is built and analyzed. In this chapter will include questionnaire analysis section, full detailed description of the system's functional requirements, which have been mentioned in the previous chapter. In addition this step is important to develop and complete the system. Second, we illustrate some model, which present the functionality provided by a system in terms of actors.

5.2 Questionnaire analyzing

The questionnaire has been done by the research team. Thirty subjects are participated from both genders. The subjects present all level of society, 10 students from both gender and 20 of other level of society.

The following table shows questionnaire analysis in percentage for each home criterion:

	نتائج تحليل الاستبيان: نص السوال	النسبه المنويه		نتانج تحليل الاستبيان: نص السوال النسبة المنوية		
	Distrator	1	۲	٣	٤	0
30-3	درجة الاهتمام بسعر المنزل	%.	%Y	%٢٣	%٣.	%£.
	درجة الاهتمام باستقلالية المنزل	%٣	%٣	%٣.	%17	% EY
1	درجة الاهتمام بالموقع	%•	%Y	%٣	%٣٣	%°Y
:	درجة الاهتمام بمساحة البيت	%٣	%18	%٢٧	%٤.	%17
C	درجة الاهتمام بأن يتكون البيت من طابقين	%٣.	%£.	%٢٧	%٣	%.
•	درجة الاهتمام بعدد غرف المنزل	%•	%٢٠	% ٤٣	%٣٤	%٣
٧	درجة الاهتمام ببيت مشمس	%٣	%٣	%18	%17	%7٤
٨	درجة الاهتمام بأن يتوفر بالبيت	%٢٣	%٤٦	%10	%15	%٣
	تسهيلات (كالمصعد وحارس)					
9	درجة الاهتمام بأن يكون البيت بناؤه حديث	%1.	%٢.	%٢٧	%٣.	%15
١.	درجه الاهتمام بوجود حديقة	%٣	%٢٣	%٢٧	%٢٧	%٢.
11	درجة الاهتمام ببعده عن مكان محدد	%15	%YY	%٤٣	%1.	%Y

Table 4. 1: Questioner Analysi

Description of functional requirements

Functional requirements determine what the system does? Or in other words it defines specific behavior or functions. The functional requirement of the proposed system done by three different categories of users:

- System administrator.
- Home owner.
- Renter users.

The description of their requirement done as follow.

System administrator requirement 4.3.1

a. Adding new home

Description	Thoral
	The administrator will be able to add new home
	and user's information.
Inputs	Entering the home and users information to the
•	database.
Source	administrator
Outputs	Naw home and a 1 i C
	New home and user's information will be added
	to the database.
Requirements	The information that related to a specific home
Update his passes	must be accepted from the administrator
	Table 4. 2: administrator requirements

Table 4. 2: administrator requirements

b. Opdate some or all information's.

Description	The administrator can change and update the information about a specific home and users if there is changes on the control of the changes of the change of
Inputs Source	there is changes come from the owner. The owner Id for home, first name for users administrator
Outputs	The information in the database is modified.
Requirements	The owner Id and first name that entered must exists in the database
	Table 4. 3: administrator

Table 4. 3: administrator requirements

c. Delete

The administrator will be able to delete any
home and use C
home and user from the database.
Owner Id for home, first name for user
administrator
Delete a particular house or user from the
database
The home No must exist in the database.

Table 4. 4: administrator requirements

1. Update his password

Description	The administrator can to change his password
Inputs	His new password
Source	administrator
Outputs	The new password
Requirements	He must enter as an administrator and enter his
	id

Table 4. 5: administrator requirements

Home Owner Requirements

1. Filling and sending the home information to the administrator.

The home owner will fill inc.
The home owner will fill information about his home in a form then send it to the administrator.
data about the home
The owner
After the administrator accept the home the home can be viewed by the renter
Open the form and fill it with the data

Table 4. 6: Home owner requirements

- 2. Make different operations related to his home information and his information to the database:
- a. Update some data:

The owner can change and update specific	
information about a his home and information	
The new data	
owner	
The information in the database is modified.	
OwnerId	

Table 4. 7: Home owner requirements

b. Delete:

Description	The owner will be able to
	The owner will be able to delete his home from the database.
Inputs	ownerId
Source	owner
Outputs	Delete his house from the database
Requirements	Table 4. 8-P. Ta
	Table 4 8.D

Table 4. 8:Renter requirements

4.3.2 Renter Requirements

1. Choosing the home criteria

Description	The users have to choose the home properties that he would like to have it like choosing the most suitable price for him.
Input	Choosing the home properties.
Source	The renter
Output	The homes that related to the criteria that the user choose
Requirements	The homes should be in the database.

Table 4. 9: Renter requirements

2. display the home information and video

Description	The user can see the home information that related to the criteria that he choose it from the dynamic query .also can see the video to the home and that done by clicking on the points that on the map
Input	Choosing all the required criteria.
Source	The renter
Output	The homes that related to the criteria that the user choose
Requirements	Click on the mark that will appear in the map

Table 4. 10: Renter requirements

3. Viewing a collection of photos for homes and displaying its information.

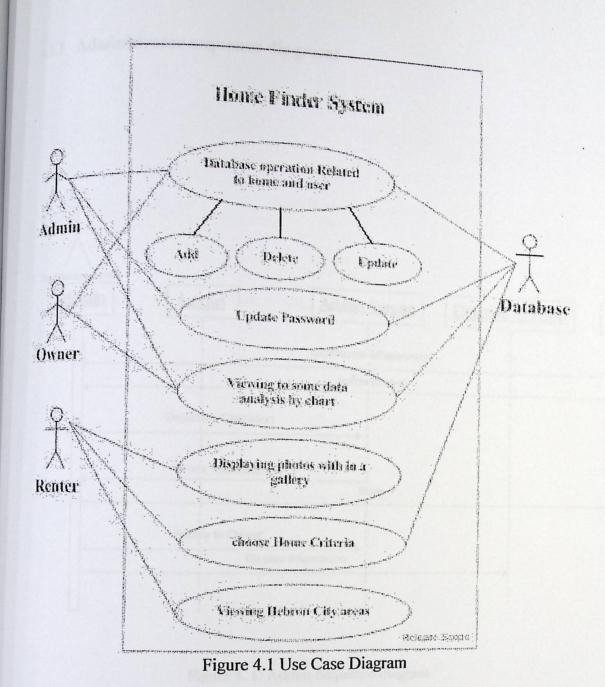
Input Let Mouse over the picture Source The renter Output The picture that will selected and it description	Description	The user can navigate photos for homes within a gallery
Source The renter Output The picture that will selected and it description		And read some information that related to specific home picture
Output The picture that will selected and it description	Input	Let Mouse over the picture
	Source	The renter
Requirements Click the glary icon	Output	The picture that will selected and it description
	Requirements	Click the glary icon

Table 4. 11:Renter requirements

4. Displaying Hebron map.

	know more
oron map to	know more
to rent home	know more es in area they

4.4 Use case diagram



٤٨

4.5 Sequence diagram

4.5.1 Administrator sequence diagram:

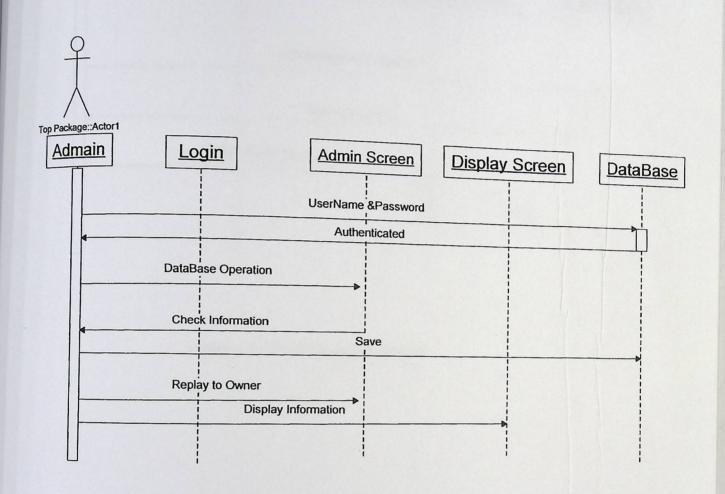


Figure 4. 1: Admin Sequence diagram

4.5.2 Home owner sequence diagram:

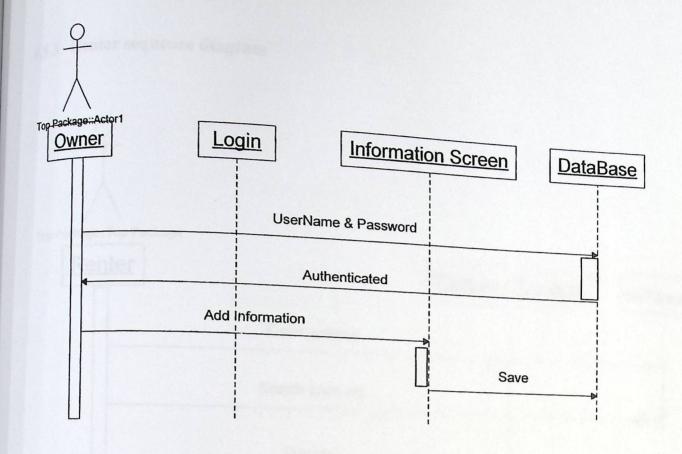


Figure 4. 2: Owner Sequence diagram

4.5.3 Renter sequence diagram

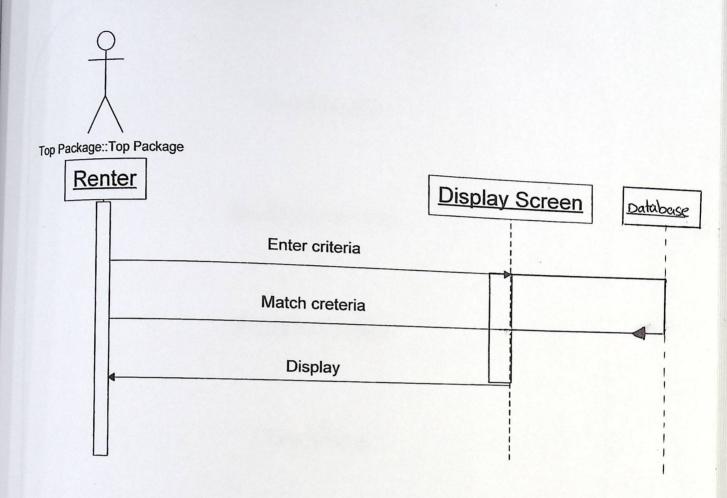


Figure 4. 3: Renter Sequence diagram

Chapter 5 System Design

Introduction

Database Design

Screens Design

Test Plain

5.1 Introduction

The primary deliverable of the design phase is design specifications that satisfy the software requirements. This chapter is divided into several sections. In each section one of the design specification is described such as designing database, screens a finally, text plan is discussed at the end of this chapter.

5.2 Database Design

There are several tables in data base as follows:

- User table:
- Home table:
- Places table:

The following are data dictionaries for each table. Include the description for each field and validation is there in note column

Field	description	Type	size	PK/Fk	notes
User Id		Integer number	11	PK/auto increment	Auto Increment
Personal Id	the Owner Personal identification card	Integer number	9	unique	required
First Name	the user first name	text	50	460000000000000000000000000000000000000	required
Middle Name	the user middle name	text	50		required
ast Name	the user last	text	50		required
Phone No	the user phone	Integer number	11	o taka	required
Work No	the user Work	Integer number	11		null
Address	the user home Address where he is	text	100		required
mail	living the user email	text	100		required

Group	the user type admin, or owner where admin set to 1	Integer number	1		
	Table	e 5. 1: data diction	onary for user	tabl	

The following table describes the data dictionary for the home table:

Field	description	Туре	size	the nome table:	
Home Id		Integer number	11	PK/auto	notes
Home No	The home No where it is identeficates from the Hebron City Hall	Integer number	9	increment unique	Auto Increment required
Owner Id		Integer number	50	FK	required
Place		Integer Number	11	FK	required
Address		text	50		required
Price		Float number	3		required
Area		Float number	11		null
Number of Rooms		Integer number	2		required
Floor No		Integer number	2		required
Other Feature		text	300		Null
Video		text	100		Null
oicture		text	100		Null
X		Float number	3	unique	required
(Float Number	3	unique	required
Rented		Integer Number	1		
ccepted		Integer No	1		

Table 5. 2: data dictionary for Home table

Gald	description	Type	Mai La Dinasa		
Field Place Id		Integer	size	PK/Fk	Mozor
Place		number		PK/auto	notes
21.00	Hebron city	text	0	increment	Auto
Place	areas				Increment
	Tab	le 5. 3: data dicti	000		
		ווטום שייים	ollary for Plac	es table	

ctionary for Places table

The figure below shows the relations between two tables (class). Each class has its own properties and methods. Properties are described in previous tables. The methods will be described below.

User class methods:

- Add User: it's enable the admin and owner to adjoin user
- Delete User: its enable the admin to cross out user from database
- Update User: its enable the admin and owner to exchange the old user data with the new.

Home Class Methods:

- Add Home: it's enable the admin and owner to adjoin Home.
- Delete Home: its enable the admin to cross out home from the database.
- Update Home: its enable the admin and owner to exchange the old home data with the new.

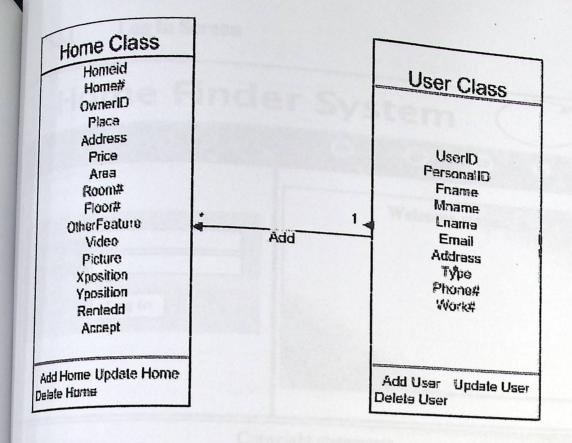


Figure 5. 1: Database Class Diagram

5.3 Screens design

In the direction of facilitating the process of designing before going on the actual design; we will produce the screen prototypes using (Pidoco). The prototypes helps us in determining which aspects are valuable and which parts need to be changed, revised, or discarded. The prototyped screens are shown below with a logical design for each one.

There is main menu in all system screens. The menu includes the following items:

- Home
- Renting:
- Gallery:
- Sign up: let the owner to enter his own information.
- About us:
- Contact us:

Figure 5. 2: Login Screen

The following table describes the login screen description:

Object	Fieldname	Data type	Description	Validation
textbox	Username	Text	Enter username	The username must be as the email address of the user.
textbox	Password	Text	Enter password	The password not less than 6 characters.
	T Was a substant	Townson specific tree		

Table 5. 4; Login description

shexpressed th	ne site	er Syste	-111	
Fill In The Folk	woing blanks w	ith The P		-
- manufacture manu	. Salaninini	rith The Required In	formation	
naND	The state of the s			
	7			
ame				
Name	1	Marine and the second		
ama.	Ĭ.			
Address				i
	E a a a a a a a a a a a a a a a a a a a	The same of the sa		
*				
e#	1			
#	Ė			
	Save	Reset		

Figure 5. 3: Sign Up Screen

The following table describes the sign up screen description:

Object	Fieldname	Description	Data type	Validation
textbox	Personal ID	The person identification card number	Integer Number	Class validation.
textbox	First name	Owner first name	Text	Class validation
textbox	Middle name	Owner middle name	Text	Class validation
textbox	Last name	Owner last name	Text	Class validation
textbox	Home address	Owner home address where the owner live.	Text	
lexibox	Phone number	owner phone no	Integer Number	Class validation
textbox	Work number	owner work no if available	Integer Number	Class validation
textbox	Email	Owner email address	Text	Class validation
Button	Save	Saving owner information		Class validation
Button	Reset	Clear all field		

Table 5. 5: Sign up screen description

Figure 5. 4: user operations in admin screen

	add at an extended a second	
UserID		
Personal(D)		
FirstName	To the second se	
MiddleName	E patricipal visit and service description	
Last Name	· ·	
HomeAdd ress		
Phone#		
Wark#		
Email		
	Close Close	
	Save Reset Close	

Figure 5. 5: Add user screen

The following table describes Add user screen description:

Object	Fieldname	Description		
textbox		The person	Data type Integer number	Validation
Itar		identification card number	o- number	class validation
textbox	First name	Owner first name	Text	Class validation
textbox	Middle name	Owner middle name	Text	Class validation
textbox	Last name	Owner last name	Text	Class validation
textbox	Home address	Owner home address where the owner live.	Text	
textbox	Phone number	owner phone no	Integer Number	Class validation
exbox	Work number	owner work no if available	Integer Number	Class validation
extbox	Email	Owner email address	Text	Class validation
Button	Save	Saving owner information		_
utton	Reset	The person identification card number		
utton	Close	Owner first name		

Table 5. 6: add user screen description

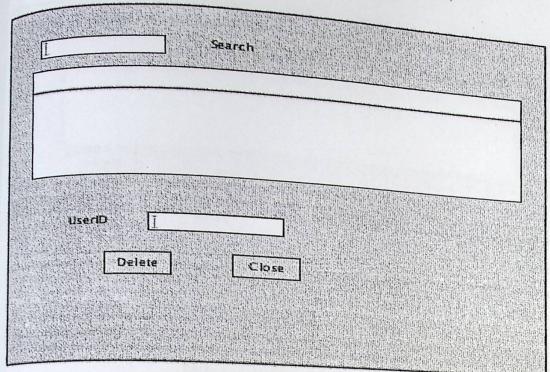


Figure 5. 6: delete user screen

The following table describes delete user screen description:

Object	Fieldname	Description	Data type	Validation
Input textbox	First name	Entering the user	Integer	
		first name, in	Number	
		order to display		
		its information.		
Input textbox	User Id	User id that	Integer	Class validation
		displayed in the	Number	
		datagrid		AND STATE OF THE S
outton	Delete	Delete the User	<u></u>	_
		from the database		
button	Close	Close the screen		

Table 5. 7: delete user screen description

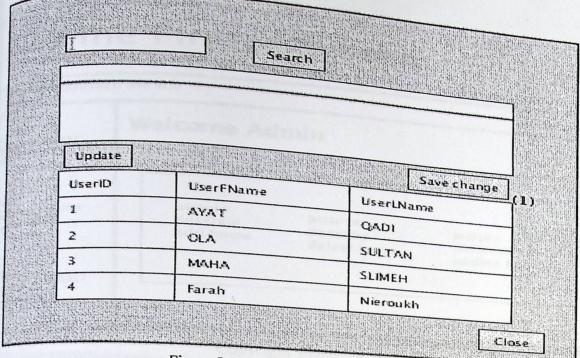


Figure 5. 7: update user screen

The following table describes update user screen description:

Object	Fieldname	Description	Data type	Validation
Textbox	First name	The user first name, in order to display its information	Integer Number	
button	Update	Present the datagrid to enable update		_
button	Save change	Save the updated information		
button	Close	Close the screen		
utton	search	present all the users with the entered first name		

Table 5. 8: update user screen description

	Welcome Ad	maia	
ure Unbe User	Liser Operation		
ture cribe Home ne ture cribe Chart	picture describe add home	picture describe delete home	picture describe update home

Figure 5. 8: home operation admin screen

			The same of the same
Place	first entry	J	
Home#	Fug		
Room#			
Floor#			
יין ועטו וי	[:		
Price		away want to	
Address	Allenbare		
Area	5		
Мар	Frame contains		
Х	First		
Y	(r)	r válco	
ther Feature			
Video		Browse	
Picture	7	Brows2	lose

Figure 5. 9: add home screen

The	Fieldnam	ole describes add home screen descri	ption:	
Object	e		CVI DE NET DE RIVERS	
00	User Id	Entering The user identification	Data type	Value
LOX	USELIA	card number	Inta	Validation
ribox		oura number	Integer Number	Class
/	Place	Contains Hebron areas		Class validation
op Down			Text	
1	Home	Entering the home		
box		Entering the home number.	Integra	
100	number		Integer Number	Should identify
		E. d. i		from Hebron city
fox	Address	Entering home address	T	hall
10.1			Text	
_	number	Entering home room number		
10X	of Rooms	The room number	Integer Number	CI
			o	Class validation
OX.	Price	Entering home price	Inter	
			Integer Number	Class validation
	Floor	Entering home fla		- undation
X	number	Entering home floor number	Number	Class
	number			Class validation
X	Area	Entering home area	Elect	
			Float number	Class validation
	Mon	Mon for the 1		
er	Map	Map for the selected place		
X	X	Home X position	Float Number	~
			Ploat Number	filled by clicking
				on the map
				where the home
	Y	Home Y position		is located
	1	Home i position	Float Number	filled by clicking
				on the map
				where the home
				is located
	Other	Other features the owner want to	Text	
	feature	display		
	Video	Entered home video	Text	Class validation
	rideo	Entered nome video	Text	Class varidation
	Picture	Entered home picture	Text	Class validation
1	Browse	D . C 1 .1		
	blowse	Browsing for a home video		
1	Browse	Browsing for a home picture		
+	164			
I	Add	Add the information in the		
		database		
(Close	Close the screen		
		CIOSE THE SCIECH		

Table 5. 9 :add home screen description

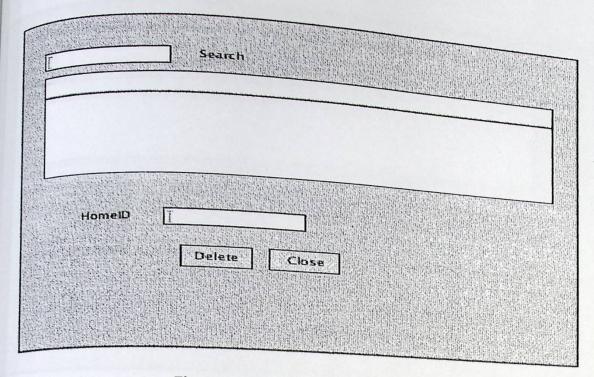


Figure 5. 10: delete home screen

The following table describes delete home screen description:

Object	Fieldname	Description	Data type	Validation
textbox	Owner ID	Enter the owner id do display his homes in a datagrid	Number	
textbox	HomeId	Enter the Home Id to delete it	Number	
button	Delete	Delete home from the database.		
button	Close	Close the screen	_	
button	search	Present all the owner homes that is related to his id		

Table 5. 10: delete home screen description

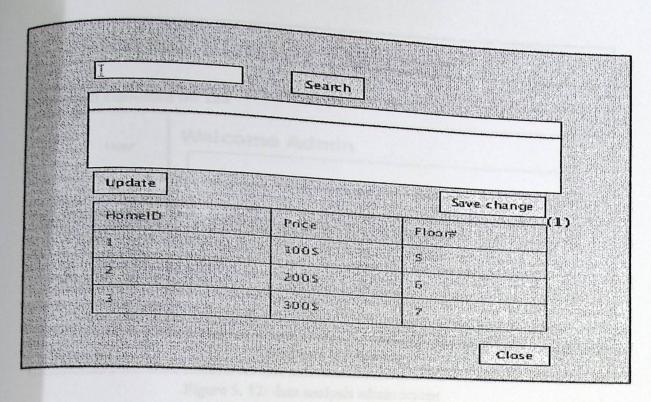


Figure 5. 11: update home screen

The following table describes update home screen:

Object	Fieldname	Description	Data type	Validation
textbox	Owner id	Contains the Home id to update the information	text	
button	Update	Update home information	_	_
button	Save change	Save change to database		_
button	Close	Close the screen	_	
button	search	Present all the owner homes that is related to his id		

Table 5. 11: update home screen description

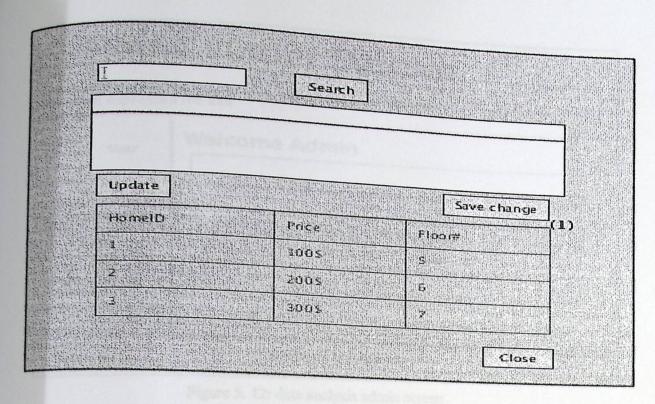


Figure 5. 11: update home screen

The following table describes update home screen:

Object	Fieldname	Description	Data type	Validation
textbox	Owner id	Contains the Home id to update the information	text	
button	Update	Update home information		_
button	Save change	Save change to database	-	_
button	Close	Close the screen		
button	search	Present all the owner homes that is related to his id		

Table 5. 11: update home screen description

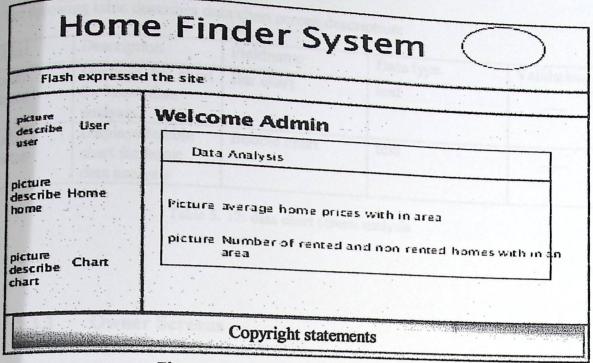


Figure 5. 12: data analysis admin screen

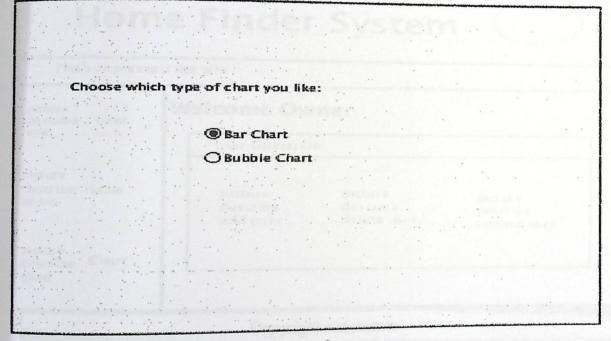


Figure 5. 13: data chart screen

The following table describes data chart screen description:

Object	Description	Fieldname		
Radio Button	Displays bar chart for home data	Bar chart	Data type text	Validation
Da	analysis.			
Radio Button	Displays bubble chart for home data analysis	Bubble chart	text	

Table 5. 12: data chart screen analysis

5.3.3 Owner Screens

Flash expressed the site				
picture describe User user	Welcome Ov	vner		
	Liser Operation			
picture describe Home home picture describe Chart	picture ਹੋਵਨਵਾਲੇਵ ਬਹੇਰੇ user	picture describe delete user	picture describe update user	

Figure 5. 14: user operation owner screen

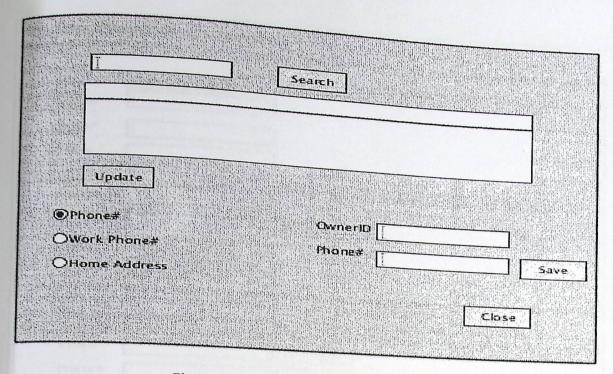


Figure 5. 15: update owner information

The following table describes update owner information screen description:

Object	Fieldname	Description	Doto trans	- A 7 . 12 1
textbox	Owner id	Entering the owner id to display	Data type Integer Number	Validation
button	Update	his information		
	Spaare	Displays owner data to update it	Integer Number	
textbox	OwnerId	Entering owner id to update his information	Integer Number	
textbox	Phone#	Entering the new phone no	Integer Number	
Radio button	work#	Entering the new work no	Integer Number	Should be choose
button	Save	Save data to database		
button	search	Present all the owner information that is related to his id		
button	Close	Close the screen		

Table 5. 13: update owner information screen description

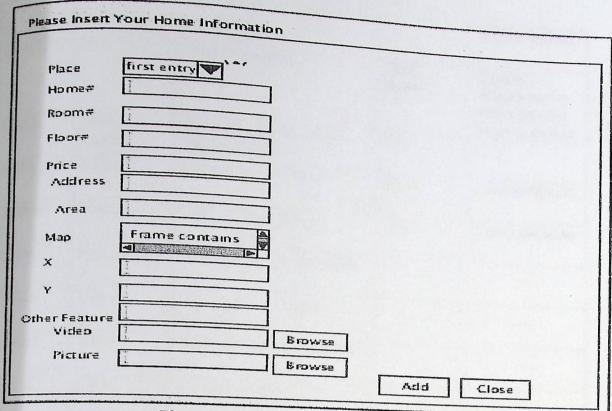


Figure 5. 16: add home owner screen

The following table describes add owner screen description:

Object	Fieldname	Description	Data type	Validation
textbox	User Id	Entering The user identification card number	Integer Number	Class validation
Drop Down List	Place	Contains Hebron areas	Text	
textbox	Home number	Entering the home number.	Integer Number	Should identify from Hebron city hall
textbox	Address	Entering home address	Text	
textbox	number of Rooms	Entering home room number	Integer Number	Class validation
textbox	Price	Entering home price	Integer Number	Class validation
textbox	Floor	Entering home floor number	Number	Class validation
textbox	Area	Entering home area	Float number	Class validation
Scroller	Мар	Map for the selected place		
textbox	X	Home X position	Float Number	filled by clicking on the map where the

textbox	Y	Home Y position	Float Number	home is located filled by clicking on the
textbox	Other feature	Other features the owner want to display	Text	map where the home is located
textbox	Video	Entered home video	Text	Class validation
textbox	Picture	Entered home picture	Text	Class validation
button	Browse	Browsing for a home video	0 6101	
button	Browse	Browsing for a home picture	description	_
button	Add	Add the information in the database		
button	Close	Close the screen	_	

Table 5. 14: add home owner screen description

Ī		Search				
	7-18-18-18-18-18-18-18-18-18-18-18-18-18-					
				versana sa manasa distric	nung saku tand saga	
	HomeID					
		Delete	Close			

Figure 5. 17: delete home owner screen

The following table describes delete home owner screen describes

Object	Fieldname	Description Description	ription:	
textbox	Owner id	Entering the owner id to display his information	Data type Integer	Validatio n
Textbox	Home Id	entering the HomeId to delete it	Number Integer	(Mary)
button	Delete	Delete the home from the database	Number	
Button	Close	Close the screen		
button	search	Present all the owner homes that is related to his id		

Table 5. 15:delete home owner screen description

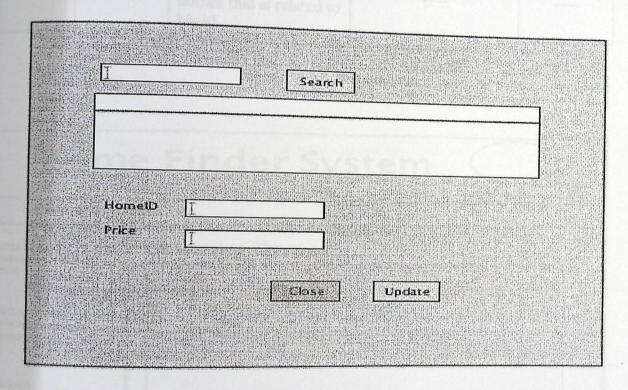


Figure 5. 18: update home owner screen

The following table describes update home owner screen description:

Fieldname	Description	T	
Owner id	Entering owner id	Data type	Validation
	display his homes	meger Number	
Home id	Entering the home Id		
	D monte 10	Integer Number	
Price	Entered the new b		
	price new nome	Integer Number	
Update	Update the home price		
		——————————————————————————————————————	
Close	Close the screen		
search	Present all the owner		
	homes that is related to his id		
	Home id Price Update Close search	Home id Entering the home Id Price Entered the new home price Update Update the home price Close Close the screen Present all the owner homes that is related to	Home id Entering the home Id Integer Number Price Entered the new home price Update Update the home price Close Close the screen Present all the owner homes that is related to his id

Table 5. 16: update home owner screen description

Hom	e Finder System
Flash expresse	d the site
picture describe User user picture describe Home home	Picture Number of time home is clicked
picture describe Chart thart	Copyright statements

Figure 5. 19: data analysis owner screen

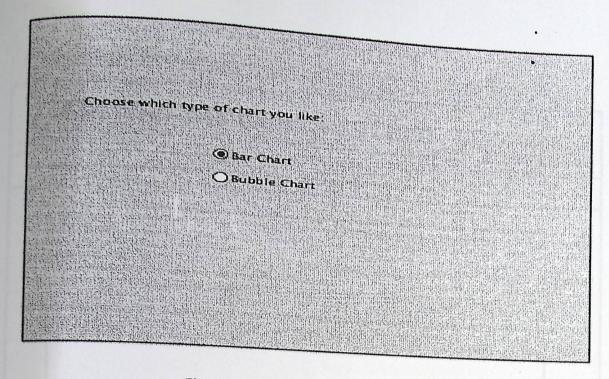


Figure 5. 20:data chart owner screen

The following table describes data chart owner screen description:

Object	Fieldname	Description	Data type	Validation
Radio Button	Bar chart	Displays bar chart for home data analysis.	text	
Radio Button	Bubble chart	Displays bubble chart for home data analysis	text	

Table 5. 17: data chart owner screen description

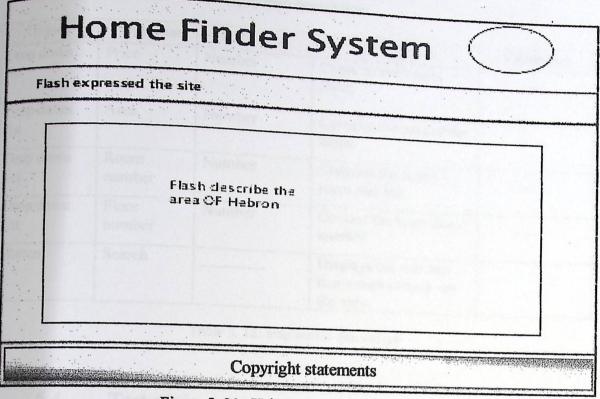


Figure 5. 21: Hebron city areas screen

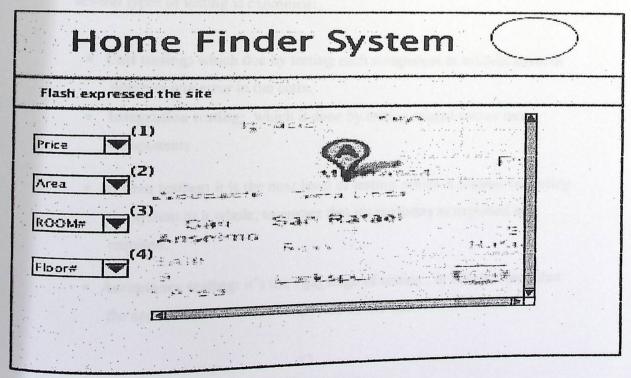


Figure 5. 22:map screen

The following table describes map screen description:

Object	Fieldname	Data type	20 NSP001	
Drop down list	Price	Number	Description Contains the homes price	Validation
Drop down list	Area	Number	Contains the area of the home	Gen.
Drop down list	Room number	Number	Contains the home room number	malii <u>a so</u> taka
Drop down list	Floor number	Number	Contain the home floor number	MCS upo venera
Button	Search		Displays the matches home with criteria on the map.	

Table 5. 18: map screen description

5.4 Test plain

Test plan is require to verify and ensure that our system meets the design specification and the system requirement. Indeed, testing is essential to examine the accuracy of project and its free from errors. In order to do so, several types of testing is examined:

- Unit testing: which doe by testing each component or module alone to discover any error in the code.
- Integration testing: which it done by testing related two or more components.
- System testing: it is the next level of testing, which it focuses on testing
 the system as a whole; to ensure that it's performs as expected and
 required.
- Acceptance testing: it's the vital stage of testing, in which ensure that
 the application behaves as expected by the user.

Our test plan will be as the following:

- Make testing unit after finishing each unit of code which has specific function
- Make System testing for adding home in specific coordinator and displaying home image in the same position.
- The developer team will make System test for the whole system.
- Making acceptance testing during designing for some functionality to take early feedback such as icon positions and interface skin. Indeed we want to make testing after finishing system development.

Chapter 6

System Implementation, Testing, and Recommendation

Introduction

Development Software tools

Faced Problems

Important Code

System Screens

Testing

Recommendations and feature work

6.1 Introduction

In implementation phase, we will code the designed project in previous chapter either from scratch or by composition. Indeed, we test our project to build free errors project as possible as we can. Actually we faced a lot of problems because we used new software tools in building the project. Therefore, in this chapter we will talk about the major features of the new software tools and major problem faced us during implementation. In order to make learnable document, we illustrate how to make new project in adobe flex and we put some foremost functions code. Finally captured interface is demonstrated.

6.2 Development Software tools:

In this section, we depict the most important software are used in development the project which are Adobe flex4, PHP and Photoshop.

6.2.1 Adobe Flex builder 4:

Flex is framework and programming language used in building visual and highly interaction interfaces. That enables us to build rich website, mobile, and desktop applications using actionscript language and extensible markup language (XML). Action Script is an object oriented programming language is used to build client side dynamic web pages. It is similar in syntax to JavaScript. Whilst, XML language is an XML-markup language, which it is used to layout application display elements. Moreover adobe flex uses XML to be the container between it and other environments. (http://www.adobe.com/products/flex)

Advantage:

Referring to previous mentioned adobe site, there are several advantages that are summarized in the following points:

- 1. It reduced the time and cost of the application creation and maintenance.
- 2. It supports an open source libraries for pure information visualization like bird eye.

- 3. It's supported the applications with rich component like busy cursor and
- 4. Flex can migrated with different environment like php,coldfusion.asp.net...etc
- 5. The ability to incorporate rich media like streaming video and sound.

Steps for starting New Project in flex: 6.2.1.1

1. Write the project name and choose the server technology you want to connect with.

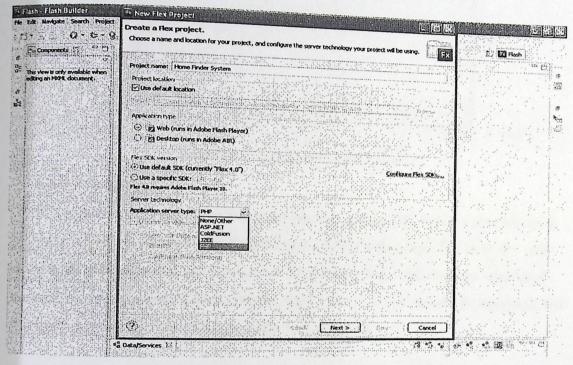


Figure 6. 1: Create Flex Project

2. Write the web root and its URL then validate it.

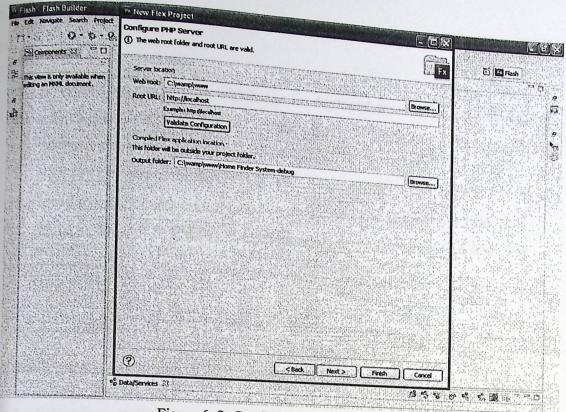


Figure 6. 2: Configuration PHP Server

6.2.2 PHP:

PHP is stand for Hypertext Preprocessor because it basically handles data before it becomes HTML as illustrated in figure Pages (ASP) technology. By PHP the web developer creates dynamic web pages by interacting with databases and displayed customized information. (Larry Ullman 2009) (5...). It is a server side language and it is used as an alternative of Microsoft's Active Server

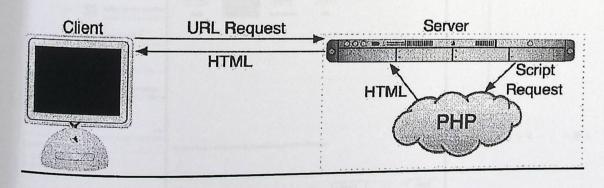


Figure 6. 3: How PHP works

Advantage:

Referring to the previous mentioned book ,there is several advantage for PHP. Such as:

- 1. Its standalone interpreter, which can be deployed on most of the web servers and operating systems.
- 2. Its freely available.
- 3. PHP can be embedded into HTML source document.
- 4. Its allows to perform complicated operation because it's a server side.
- 5. Its more cheaper to fined hosting because its open source not like ASP, VB.

6.2.2.1 Adobe flex 4 with PHP:

To connect adobe flex 4 with PHP follow the mentioned steps:

1. Select from Data menu connect to data service and chose PHP.

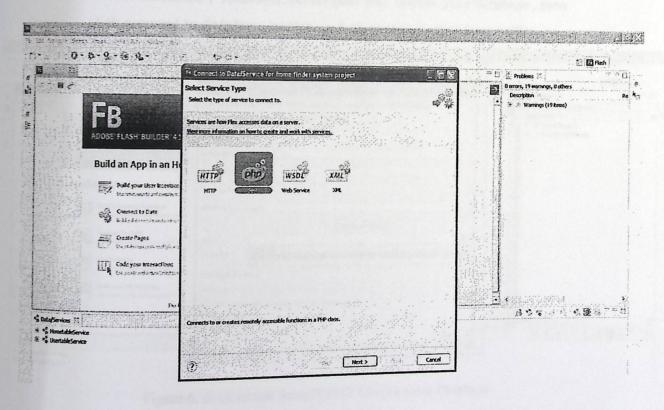


Figure 6. 4: Select Service Type

2. Click to click here to generate a service.

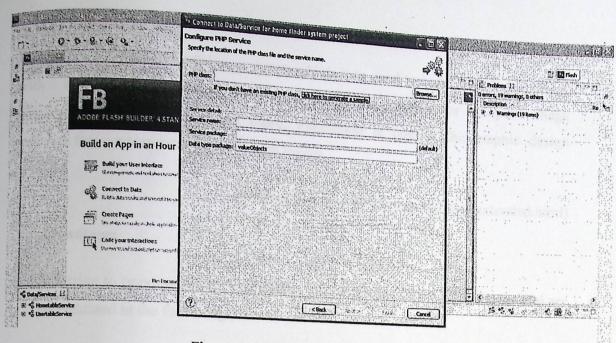


Figure 6. 5: PHP Generate Service

3. Fill the username, localhost, server port and choose your database. then click connect to database button and choose your database table.

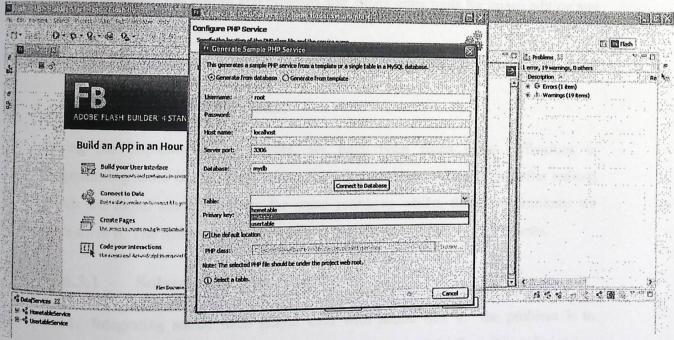


Figure 6. 6: Generate Sample PHP Service from Database

6.2.3 Adobe Photoshop CS5

Photoshop is a graphics editing program which it is used to redefined digital image with new photography tool and breakthrough capabilities for complex image painting, realistic, selection and more. Photoshop is one of the graphic design software that enables users to work with layers.

(www.adobe.com/products/photoshopextended.html)

Advantage:

Referring to previous mentioned adobe site, there are several advantages that are summarized in the following points:

- 1. Complex selection are made easily, in which user can select a specific area with fewer clicks.
- 2. Photoshop gives the user high opportunity to change the images picture as they prefer.
- 3. Photoshop has add-in and plug-ins and many other tools for image editing and creation.

6.3 Faced problems

During the implementation process, we have been faced some difficulties in programming some issues. This is because we used a new software, but after tedious search we found some solutions for some problems whilst, there are problems we can't solve it. The following sections depict the solved and unsolved problems.

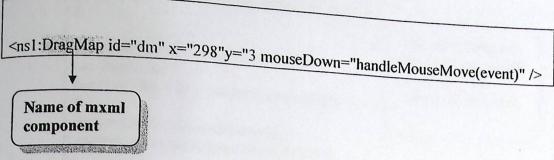
6.3.1 Solved problems

- 1. Integrating adobe flash player CS5 with adobe flex 4: the problem is to import dragged and dropped image from flash to adobe flex. The solution is
 - to take the code snippet in adobe flash player and past it in the adobe flex within the scripting area for an new MXML component

- putting the calling function in the creation complete handler that is called when the page is loaded.
- Then we called the MXML component from the flex run application as seen in the following code.

Written code in the MXML component:

```
?xml version="1.0" encoding="utf-8"?>
 <s:Group xmlns:fx="http://ns.adobe.com/mxml/2009"
  xmlns:s="library://ns.adobe.com/flex/spark"
  xmlns:mx="library://ns.adobe.com/flex/mx" clipAndEnableScrolling="true"
 width="300" height="200"
 creationComplete="group1_creationCompleteHandler(event)">
       <s:layout>
              <s: Vertical Layout/>
                                                        To call the creation
       </s:layout>
                                                        complete handler
                                                        when the page is
       <fx:Script>
                                                        loaded
              <![CDATA[
                     import mx.controls.SWFLoader;
                     import mx.events.FlexEvent;
protected function group1_creationCompleteHandler(event:FlexEvent):void
movieClip_1.addEventListener(MouseEvent.MOUSE_DOWN, fl_ClickToDrag);
movieClip_1.addEventListener(MouseEvent.MOUSE_UP, fl_ReleaseToDrop);
function fl_ClickToDrag(event:MouseEvent):void
 {
      movieClip 1.startDrag();
function fl ReleaseToDrop(event:MouseEvent):void
  movieClip 1.stopDrag();
]]>
</fx:Script>
```



2. Determining x and y home coordination the property because the position of x and y changing witten moving the map. so the solution was to use a slider for map instead of using drag and drop map. the following code is building slider for map:

```
<s:BorderContainer id="mapc" x="468" y="205" width="553"
height="332" backgroundColor="#FFDDC6" borderVisible="false">
<s:Scroller width="510" height="327" x="21" y="3" id="sc">
<s:VGroup width="510">
<mx:Image id="abur" source="@Embed(source='abu.jpg')" x="19" y="0"/>
</s:VGroup>
</s:Scroller>
</s:BorderContainer>
```

- 3. Updating specific data in adobe flex 4 cannot be handled: updating is only done only by entering all of the data again which it is not efficient. The solution is:
 - using editable data grid, by enable it editable property in the datagrid.
 - Call editdata function from a datagrid using Item Edit End property,
 which it used to swap the old value with the new one.
 - To save the changers generate click handler from a butoon and call save function.

The code for changing and swapping function is written below:

```
private function save(event:MouseEvent):void
 var dataProvider = adg3.dataProvider;
                                                  This function save
                                                  the changes. which
 var item = null:
 for (var i:int = 0; i < dataProvider.length; i++)
                                                  it called from
                                                  mouse click event.
 item = dataProvider.getItemAt(i);
 usertableService.updateUsertable(item);
 Alert.show("Data saved.");
private function editdata (event:AdvancedDataGridEvent):void
Var myEditor:TextInput =
TextInput(event.currentTarget.itemEditorInstance);
                                                               This function used
// Get the new value from the editor.
                                                               to swap the old
var newVal:String = myEditor.text;
                                                               values with the
                                                               new value.
// Get the old value.
var oldVal:String =
event.currentTarget.editedItemRenderer.data[event.dataField];
var dataProvider = adg3.dataProvider;
var item = null:
                                  Data grid name
if (oldVal !== newVal)
var item = dataProvider.getItemAt(event.rowIndex);
//CONT is the name of the row's column we want to update
adg3.selectedItem.CONT = newVal;
usertableService.updateUsertable(item);
}}
```

6.3.2 Unsolved problems

1. In order to make zooming to a specific area in Hebron map, We should to divide the Hebron map into parts depending on the areas. We made Gif image background is transparent for each area that are overlapped to be as a single component. But, If specific area is zoomed out the selected image and part of another one are zoomed. This is because of the overlapped images which they are stored in a square or rectangle container. After along search we found

the solution by editing the images using adobe illustrator, which it create vector images. But unfortunately, adobe flex does not deal with the generated format by illustrator EPS or PDF format. The following image shows the problem. The following screen snapshot illustrate the problem.

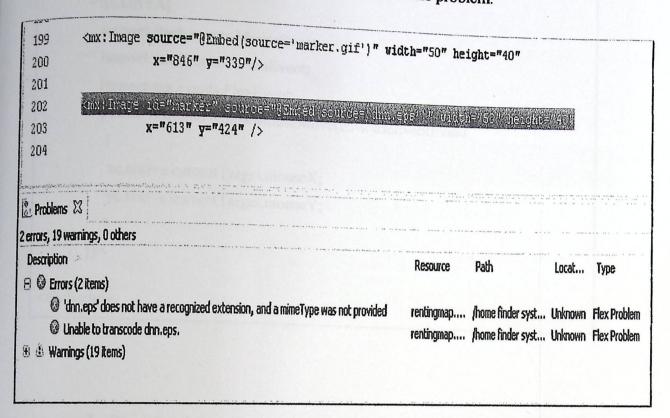
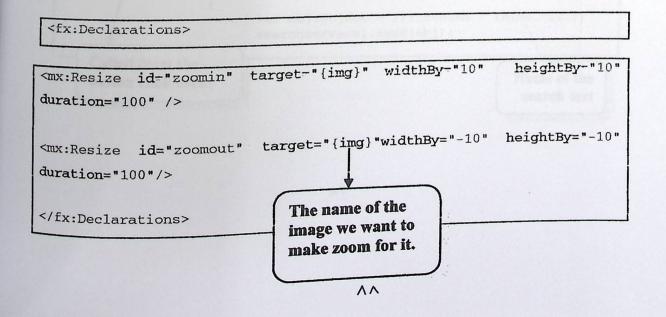


Figure 6. 7: EPS Image Format error message

6.4 Important Code

In order to write learnable document we will illustrate essential code for some processes.

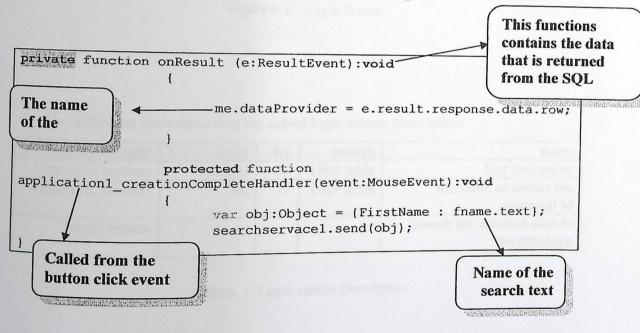
1. Making zoom-in and zoom-out for an image.



2. Locate any point within the coordination of the image.

```
<fx:Script>
<![CDATA[
    import flash.events.MouseEvent;
    import mx.events.TweenEvent;
    import mx.events.FlexEvent;
    public function handleMouseMove(e:MouseEvent):void
    {
        xc.text=e.currentTarget.mouseX;
        yc.text=e.currentTarget.mouseY;
    }
]]>
</fx:Script>
```

3. Receiving the user data in a data grid depending on the user first name.



6.5 System screens

In this section, we will display the actual screens, after implementing the system and their description.

H GO Home	Callery Sign Un Dans U
Login UserName Password Login	Welcome To Our Site Our approach is to give everyone the apportunity to live in a decent home a home they can afford in the area they want but its not easy so you can make the right move by dealing with our site for home renting in different areas within Hebron city and so you will feel difference, because our name is our quarante.
All Rights rese	erved @ www.ppu.edu Designed by OMA Group

Figure 6. 8 : Login Screen

The following table describes the actual login screen description:

Failed name	type	size	source	notes
Username textbox	varchar	50	User table	Just first name
Password textbox	int	11	User table	the same as owner the personal Id
Login button				Search the interred data in the database

Table 6. 1: Login screen Description

6.5 System screens

In this section, we will display the actual screens and their description.

H		M		FL	NI)E	R
	0	9	9		About Us	(C) Spatial Us	0
Login UserName Password Login	- 10		on on the second of the second	wake ther againdiffer	the appor axl in the ight move ent areas s	tunity to li area they w by dealing within Heb	sout nuc

Figure 6.8: Lagin Screen

The following table describes the actual login screen description

Failed name	type	sine	source	
Username textibox	varchar	50	User table	
Password textbox		++	-	1915年中央 ·
- Section Sections	int	AA	User table	the same as more
Login button				The contract of
				Search re-

Table 6. 1: Login screen Description

H	ME	FIR	VI)F	Ъ
Home	Renting Galle		(a)	(3)	
		fill in all the requ	About Us tired field	Contact Us	Help
	PersonalID	545687696			
	FirstName	Ola			
	MiddleName	Sufian			.,,
	LastName	Sultan			
	Address	En Sarah, Omar	a St		
	PhoneNo	0599303558			
	WorkNo	The second secon			
	Email	_ola89@yahoo.	com		
All Rights reserved		leset	A Crow		

Figure 6. 9: Regestration Page

The following table describes the actual registration screen description:

Failed name	type	size	source	notes
Personal id textbox	int	9	User table	
First name textbox	varchar	50	User table	
Middle name textbox	varchar	50	User table	
Last name textbox	varchar	50	User table	
Phone number textbox	int	11	User table	
Work number textbox	int	11	User table	Allow null
Address textbox	varchar	50	User table	
Email	varchar	100	User table	
Reset button				Clear the textboxes
Registers button				Registers new data in the database

Table 6. 2: Registration Page Description

6.5.1 Admin Screens:

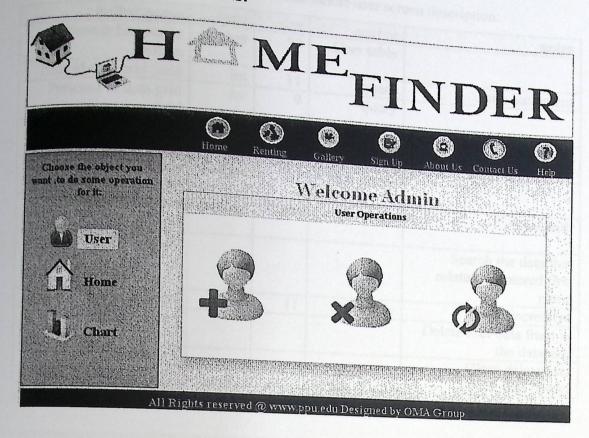


Figure 6. 10: Admin Screen

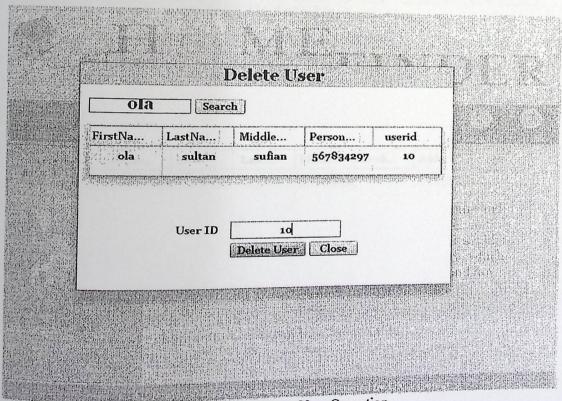


Figure 6. 11: Delete User Operation

The following table describes the actual delete user screen description

Failed name	type	SECTION VICTORIAL	user scre	en description:
Search first name textbox	varchar	size 50	Source User table	notes
User id data grid field	int	11		
Personal id data grid field	int	9	query	Auto increment
First name data grid field	varchar	50	query	
Middle name data grid field	varchar	50	query	
Last name data grid field	varchar	50	query	Allow null
Search button				Search the data that related to entered first
User id textbox Delete button	int	11	User table	name Auto increment
Close button				Delete user data from in the database
Close button	Table 6.2		T User Bygger	Close delete user container border

Table 6. 3: Delete User Description

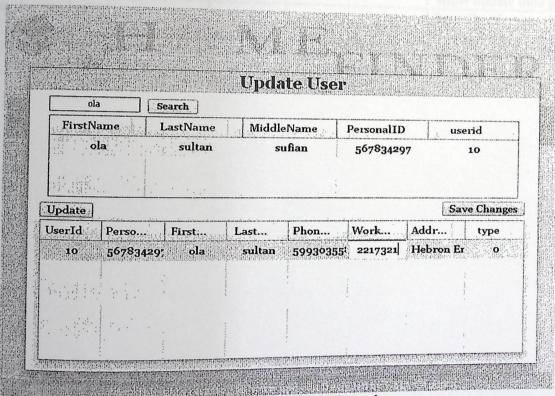


Figure 6. 12: Update User Information

The following table describes the actual update user screen description:

Failed name		A Company		escription;
Search first name textbox	type	size	source	Section of the sectio
User id data grid (1) field	varchar int	50	User table	notes
	uit	11	query	Auto increment
Personal id data grid(1) field	int	9		Auto increment
First name data grid(1) field			query	
That name and Brack Their	varchar	50	query	
Middle name data grid(1) field	varchar	50		
I + name data cuid(1) C 11	- monaj	30	query	
Last name data grid(1)field	varchar	50	query	Aller
Search button			query	Allow null
				Search the data that
				related to entered first
Personal id data grid (2) field	int	9	Heart II	name
First name data grid (2) field	varchar	50	User table	
Phone number data grid (2) field	int	11	User table	
Work number data grid (2) field	int	11	User table	
Address data grid (2) field	varchar	50	User table	Allow null
roup data grid (2) field	int	1	User table	
Jpdate button	1110	1	User table	0 or 1
ave changes button				Show update data grid
and the second				Save the changes data
Close button				in data base
- Catton				Close update user
Tc1.1. 6.4	Lindate Licer		101	container border

Table 6. 4: Update User Information Description

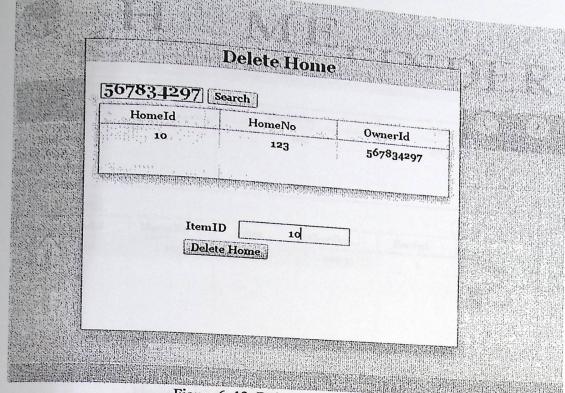


Figure 6. 13: Delete Home Operation

The following table describes the actual delete home screen description:

a a control server description.					
Failed name	type	size	source		
Owner id search textbox	int	9	Home table	notes	
Search button					
				Search for homes by ownerId	
Home Id data grid(1) field	int	11	query	Auto increment	
Home number data grid(1)	int	11	query	1 kdto morement	
field			query	A Auto secrement	
Place data grid(1) field	varchar	50	query	In Hebron city	
Owner id data grid(1)	int	9	query		
field					
Home id textbox	int		Home table	Auto increment	
delete button				Delete home from database by	
				home id	
Close button				Close delete home container border	

Table 6. 5: Delete Home Operation Description

567834297 Search		ate Home	Sivilar Profession	
HomeId			COLUMN NUMBER OF THE PARTY OF T	
10	H	omeNo	Dwr	erId
		123	567	834297
				734297
			1989 16	
Update			***	
HomeId HomeNo	Price	and the state of t		Save Change
	Price	Oth-r	the desired and and the dat int in the art and and and	- cuange
AND AND A CONTRACT OF A PARTY OF THE PARTY O	Million Williams Branchin	OtherFea	Rented	accepted
AND AND A CONTRACT OF A PARTY OF THE PARTY O	99	sunny	Rented	accepted
10 123	99	sunny	1	accepted o
AND AND A CONTRACT OF A PARTY OF THE PARTY O	99	sunny	1	THE STREET STREET
10 123	99	sunny	1	THE STATE OF THE PARTY OF THE P

Figure 6. 14: Update Home Information Operation

The following table describes the actual update home information screen description:

Failed name	type	size	source	notes
Owner id search textbox	int	11	Home table	Hotes
Search button			li ory.	Search for homes by ownerId
Home Id data grid(1) field	int	11	query	Auto increment
Home number data grid(1) field	int	11	query	
Place data grid(1) field	varchar	50	query	In Hebron city
Owner id data grid(1) field	int	11	query	
Home Id data grid(2) field	int	11	Home table	Auto increment
Home number data grid(2) field	int	11	Home table	Education of the Control of the Cont
Place data grid(2) field	varchar	50	Home table	In Hebron city
Owner id data grid(2) field	int	9	Home table	ciosi phosa number text Son nomas
Price data grid(2) field	int	3	Home table	
Update button				Show update data grid
Save change button			N. Ber	Save the changes data in data base
Close button			When	Close update home container border

Table 6. 6: Update Home Information Operation Description

6.5.2 Owner screens

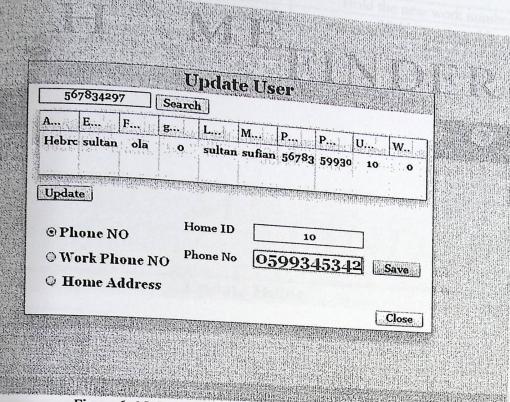


Figure 6. 15: Update Owner information Operation

The following table describes the actual lupdate owner screen description:

Print Section of the	Tapatic owner screen description:					
Failed name	type	size	source	notes		
Search owner id	varchar	50	User table			
textbox						
User id data grid	int	11	query	Auto increment		
field			query	Auto increment		
Personal id data	int	50	query			
grid field	The same of		query	de la la la companion		
First name data	varchar	50	query			
grid field	varonar	30	query			
Middle name	varchar	11	query			
data grid field	varonar		query			
Last name data	varchar	11	query	Allow null		
grid field	varonar		query			
Search button			The second section	Search the data that related to		
Staron button				entered first name		
Phone number				When clicked phone number text		
radio button				box appear		
Phone No textbox	int	11	User table	Hold the new phone number		
Owner id textbox		11	User table	isse I to Hebron ette		
	in	- 11	Oser tuere	When clicked work number text		
work number				box appear		
radio button				When clicked address text box		
Address radio				appear		
button						

int	11 1100	
varchar	50 User table	Hold 4
	User table	Hold the new work number
		Tota tile new add
		Cla save the updated data
e 6. 7: Upd	late Owner Information	Close update user container
	wher information	n Operation Description border
	varchar	int 11 User table varchar 50 User table e 6. 7: Update Owner Informatio

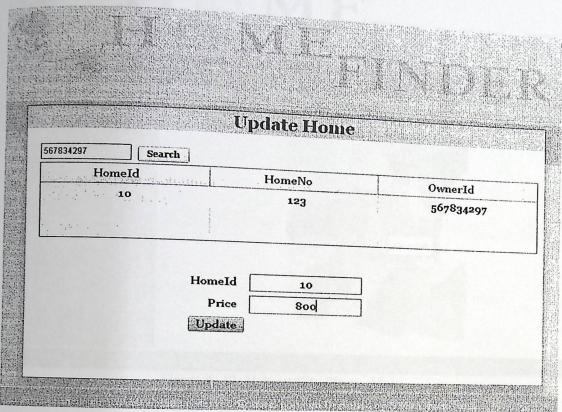


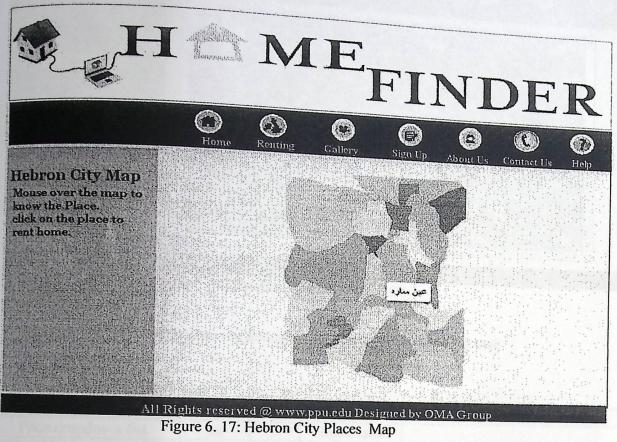
Figure 6. 16: Update Owner Home Information

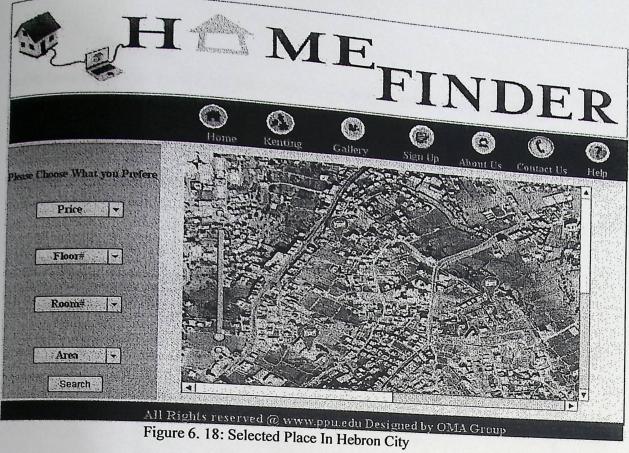
The following table describes the actual update home owner screen description:

Failed name	type	size	source	notes
Owner id search textbox	int	11	Home table	
search button				Search for homes by ownerld
Home Id data grid(1) field	int	11	query	Auto increment
field field field field field field field	int	11	query	
Price data grid(1) field	varchar	50	query	In Hebron city
field data grid(1)	int	11	query	
Home id textbox	int		Home table	Auto increment
Tice texthox	int	11	Home table	Update price in database by home
update button	****			Update price in database by nome

hutton		id
Close button		Close update home container border
	Table 6. 8: Update Owner Home Op	border peration Description
		Description

User Screens 6.5.3





The following table describes the actual select place in hebron city screen description:

Feiled name	type	size	source	notes
Price dropdown list	int	3	Home table	notes
Floor No dropdown list	int	2	Home table	
Room No dropdown list	varchar	2	Home table	
Area dropdown list	varchar	3	Home table	In Hebron city
button			Home table	

Figure 6. 19: Selected Places ion Hebton City Description

6.6 Testing

At this level of testing we will test the screens separately to ensure that the each one meet the requirement.

HIME	FIN	DER
Home Renting Galle		
	fill in all the required	Ls Contact Us Help
Personal ID FirstName MiddleName LastName Address	986425	70 ur id 5 uist tonkame i digits
PhoneNo WorkNo Email		
Register R		опр

Figure 6. 20: Registration Form Validation

Wash										
0137	<mx :="" numl<="" td=""><td>berValidat</td><td>or</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></mx>	berValidat	or							
198		cce="{work		nut) " nr	onert v="	tevt" allo	witenetiv	o=Mfa	1 30"	
133		ativeError			opercy	cent dil	wiicgaciv	1.0.		
140		main="int"								
141		ger="(but		iggerEver	t="click	"/>				

143	<mx:str< td=""><td>ingValidat</td><td>or</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></mx:str<>	ingValidat	or							
199	sour	ce="(firs	tNameText	Input)"	property	="text"				
145	4,000.000.000.000.000	initioning to be only to the	وروس د د شده و در و دروس			and the second second				
Problems 33						ignateri giladirini ili pres se sever	transferrent plant which is	national design	nation of the same	mente dependente amante de que
1 error, 20 warnings, D	others	rocosmongostomaniens	MANAGEM COST AST AST	Millerinia matamata	The state of the s	Resource				
Description					remainder letter sommer	Resource	Path	All Institute	Locat	. Type
Errors (1 item)	Make Taylor								t 127	Flex Problem
1120: Acc	ss of undefined or	perty workeNo	TextInput.			Main.mxml	/home finde	r syst	line 137	FIEX FIGUREIII
🕾 🏝 Warnings (20 i	tems)									
-44 (
	Parity della	Hilling								
Leconomic Representation of the Contraction of the			· · · · · · · · · · · · · · · · · · ·	motern reportation	Commenter the state of	ex festivation describerations	aire sa tainle ta des a clair	white in in	Control to a service to	Terminal destruction of the second
- The state of the										

Figure 6. 21: Validation Message Error

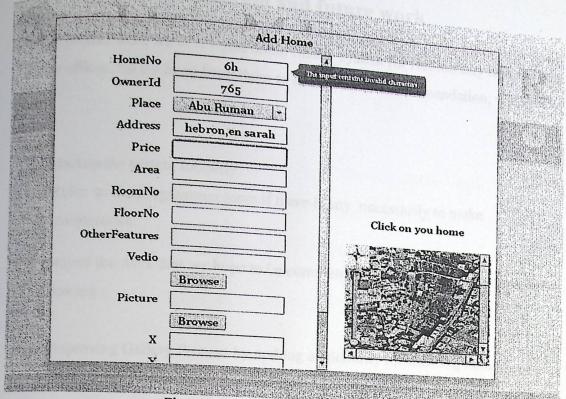
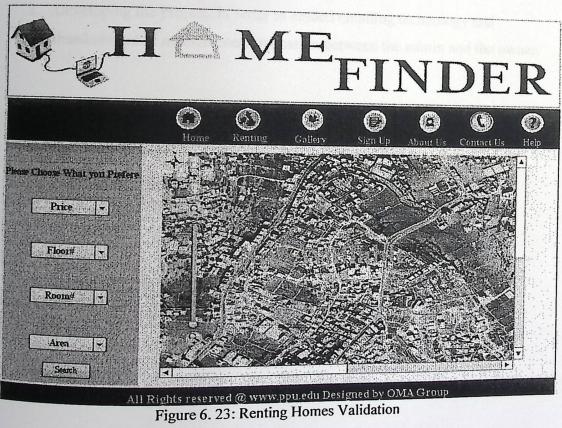


Figure 6. 22: Adding Home Validation



6.7 Recommendation and future work

In this project work we developed home finder system for Hebron city hall and real estate offices. So we hope from them to adhere to our recommendation, which is as following:

- 1. Backup the system monthly.
- 2. Refer to the programmer team if there is any necessarily to make maintenance.

In this project the work that we hope to be completed in the future by other developer, is as following:

- Improving Gallery Process by making availability for showing home information, while clicking on an image.
- Developing the project, in order to embed emailing technology and abandonment of manual communication between the admin and the owner.
- 3. Expand the project scope to be for all the Palestine authority.
- 4. Linking software system into Google earth.

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