

**An Automation on Interactive Advertisement for  
Companies on Local Street in T.R.N.C.**

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## **ABSTRACT**

In this thesis, an online interactive Web application is developed to reduce the difficulties of communication between the customers and the companies on a local street, be a bridge between the customers and the companies and contribute in economic growth.

The developed application has a friendly user interface for tablet PCs and mobile phones. In order to let the customers to navigate the companies freely, visual representation is used in the application.

Our system is developed as a prototype and applicable for using in any local street of any city.

**Keywords:** Web application, prototype, local street

## ÖZ

Bu tez, tüketiciler ve yerel caddedeki iş yerleri arasındaki iletişim zorluklarını azaltmak, tüketiciler ve caddedeki iş yerleri arasında bir köprü oluşturmak ve ekonomik büyümeye katkıda bulunmak amacıyla geliştirilmiş bir interaktif Web uygulamasını içermektedir.

Geliştirilen uygulama, tablet bilgisayarlar ve mobil telefonlar için kullanıcı dostu bir arayüze sahiptir. Tüketicilerin iş yerlerini rahat bir şekilde gezebilmelerini sağlamak için uygulamada görsel tasarım kullanılmıştır.

Bizim sistemimiz bir prototip olarak geliştirilmiş ve herhangi bir şehrin herhangi bir yerel caddesinde kullanılmak üzere uygulanabilir.

**Anahtar Kelimeler:** Web uygulaması, prototip, yerel cadde

To My Father: Eng. Nabeel Shehab

To My Mother: Dr. Sameera Adnan

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## LIST OF ABBREVIATIONS

TRNC	Turksih Republic Of Northern Cyprus
PHP	Hypertext Preprocessor
MySQL	My Structured Query Language
HTML	Hypertext Markup Language
CSS	Cascading Style Sheet
URL	Uniform Resource Locator

# Chapter 1

## INTRODUCTION

Recently, Internet takes space in our daily life because it is the newest media, and it is the medium of the future [1]. Most of the new devices such as computers, tablet PC and mobile phones are connected to the Internet. Due to this, the communication among these devices has become quite easy by using the Internet. The Internet has also created an environment for people to communicate with each other in an easier way.

Nowadays, the communication between peoples is moving to new paths. The social networking sites such as 'Facebook' and 'Twitter' are now keeping people in touch with the Web. They gather people according to their interests [2]. A lot of companies use the social networking sites to advertise their business and products, but there are still many restrictions with these sites.

In Turkish Republic of Northern Cyprus (TRNC), there are various traditional ways for the local companies to reach customers, e.g. newspapers, bill boards and radio. However, there are limitations with these types of advertising. For example, in Northern Cyprus the advertisements in newspapers and radios can only reach to a limited number of customers. The cost of Billboards advertising is an expensive way for the company's owner to exhibit their business [3]. There are also other ways to reach the customers, for instance, Google ads and Facebook ads, but still it does not provide adequate



information about the products. Because of this, communication between company's owner and customer is not enough due to the inadequate advertising. Besides, it is difficult to deliver information about products and business.

For these reasons, this thesis has concentrated on this problem and in order to overcome the problem an online interactive Web application has been developed by using PHP (Hypertext Preprocessor) [4], MySQL (My Structured Query Language) [5], HTML (hypertext markup language) [6] and jQuery (JavaScript query) [7] to display the companies visually.

The rise of the mobile phone and tablet PC market makes the businesses to adapt advertising strategies through mobile phones and tablet PCs. Many customers view marketing content via mobile phones and tablet PCs. Thus, in order to attract customer's attention through mobile phones and tablets, the focus must be on developing applications and contents in an interesting way. This can be done by enhancing the customer's interest to make the usage compatible on these devices and also having a user friendly interface for tablet PCs and mobile phones.

The aim of visual representation is not only to advertise the company or business; it is also to create an interactive visual street that customers can navigate freely in a comfortable way. A specific region of the Salamis Street is selected as a prototype to develop our application. Therefore, the system will be suitable for whole Salamis street; further it will be applicable for any street in any city.

In the rest of this thesis: architecture and design of the system explained in chapter two; the implementation of the system explained in chapter three; finally, the thesis concluded with chapter four.

## Chapter 2

### ARCHITECTURE AND DESIGN OF THE SYSTEM

This system contains following modules as shown in figure 2.1. These are administrator, company, and user module.

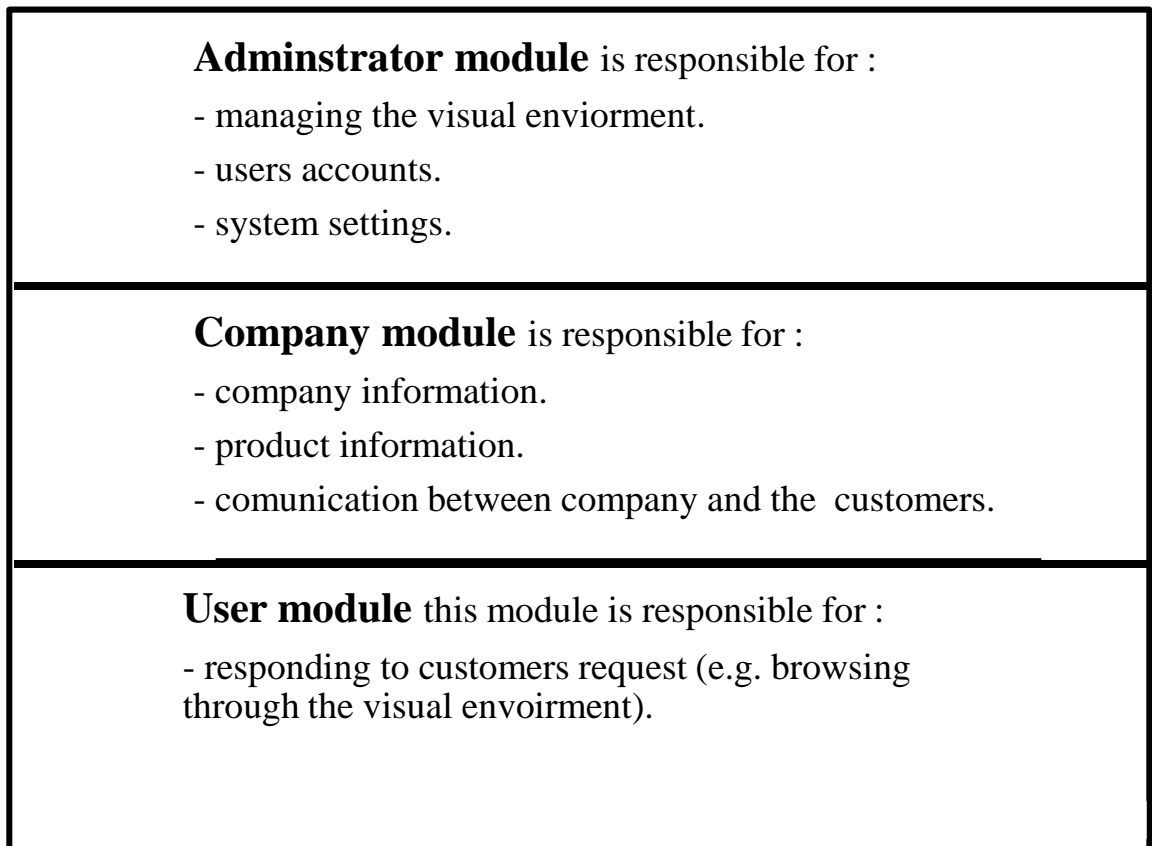


Figure 2.1 : Modules of The System

Administrator module is mainly responsible of creating building, update building, create company, update company, activate and deactivate the company, create and update pages, create users and user approval and finally edit settings of the system.

Company module is responsible of updating the company same as admin, add floors, update floors, add category, update category, add product, update products, add panorama, update panorama, and lastly update profile and also page can be added to the company and updated same as admin.

For the user module, user can visit company, view the floor of the company, view products, view panoramic picture, like the company to receive updates from company owner and finally user can contact the administrator and company owner through emails.

## **2.1 Administrator Module**

The administrator module is fundamentally responsible for managing the visual environment (building and companies), user accounts (create, delete, update, approval) and Web site settings (site logo, site title, site description, site tags).

Figure 2.2 shows the processes involved in managing the visual environment. Firstly, the administrator enters information for a new building (i.e. building name, the architecture of the building) i.e. single company or multiple company, which side of the main street where the building will be located whether left or right and the building order (it is a value entered by the administrator to assign the order of the building regarding to other buildings in the same street environment) (Process 1). The system locates the new

building by using the entered information by the administrator (Process 2). All entered information will be stored in the database. The system sends acknowledgement message to the administrator to verify that the creation of building process is successfully completed (Process 3). When administrator creates a company the following data; building name, the floor which is going to be used by the company, permalink, company title, company description, tags and logos are required. The given data is entered together with the data of the company's owner (name, surname, mobile number, address, e-mail and password) (Process 4). The company structure and the associated company owner are created at the same time (Process 5). (Note that the system automatically associates the company with the company owner in a one to one mapping and each company can have only a single owner). The company and company owner information will be stored in the database. Finally, the system sends an acknowledgement message to the administrator about the aforementioned operations (Process 6).

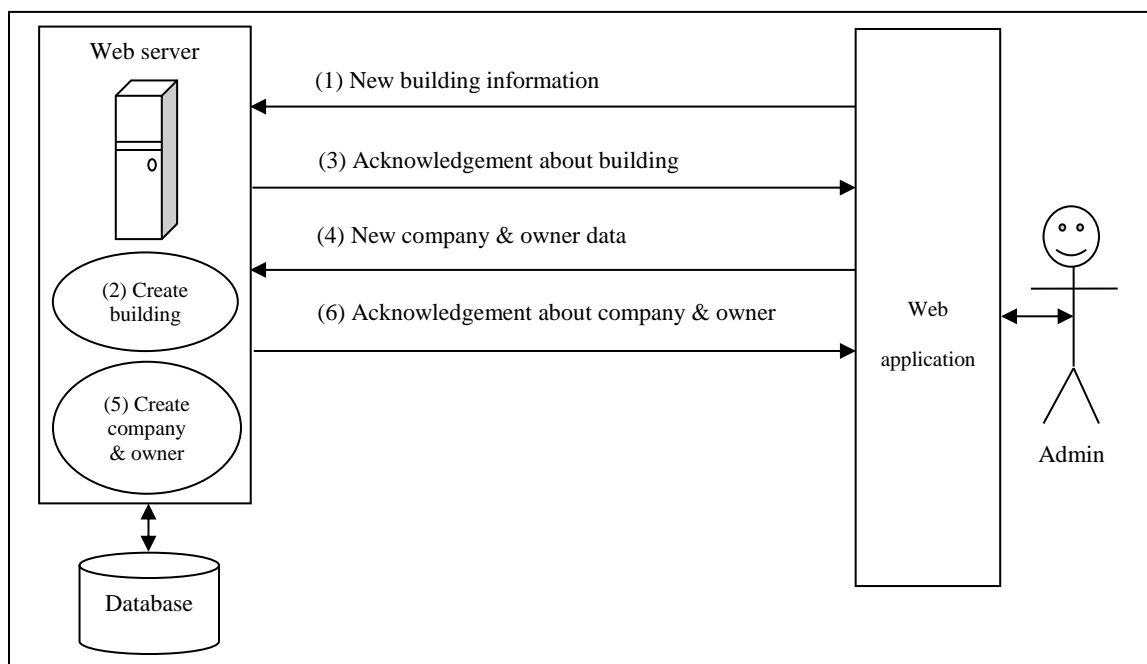


Figure 2.2: Creation of New Building, Company and Company Owner

As shown in figure 2.3, the administrator can add a new user to the system with the following data: name, surname, e-mail and password (Process 1). The system will check the database for data redundancy or duplication. If a user already exists with the same e-mail address, then, the process will be cancelled; otherwise, a new user will be created (Process 2). All entered data will be saved in the database. Then, the system will generate an acknowledgement message about creation and send this to the administrator whether it is a new user or a new admin (Process 3). The same processes to register a new user are also used to register a new administrator. However, for the administrator, mobile number, postal address, e-mail and password are required as an additional data.

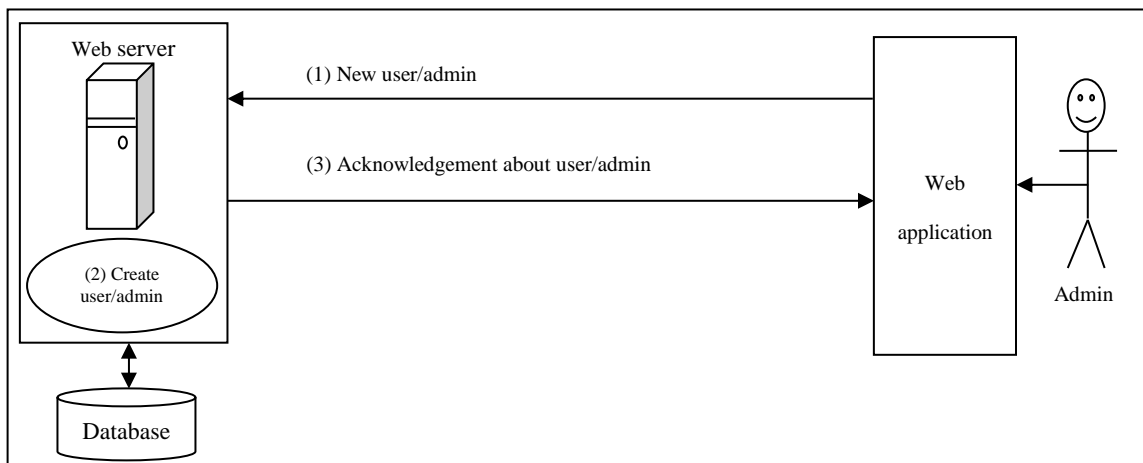


Figure 2.3: Creation of User/Admin Account

Figure 2.4 demonstrates how the settings are configured by the administrator. These configurations include logo appearance on the home page, the title, description and tags ‘an element of code used especially to establish a hyperlink’ [8]. The admin will upload or update this information (Process 1). The System updates these settings (Process 2). The updated settings will be stored in the database, then, the system sends an acknowledgment message to the administrator about the setting updates (Process 3).

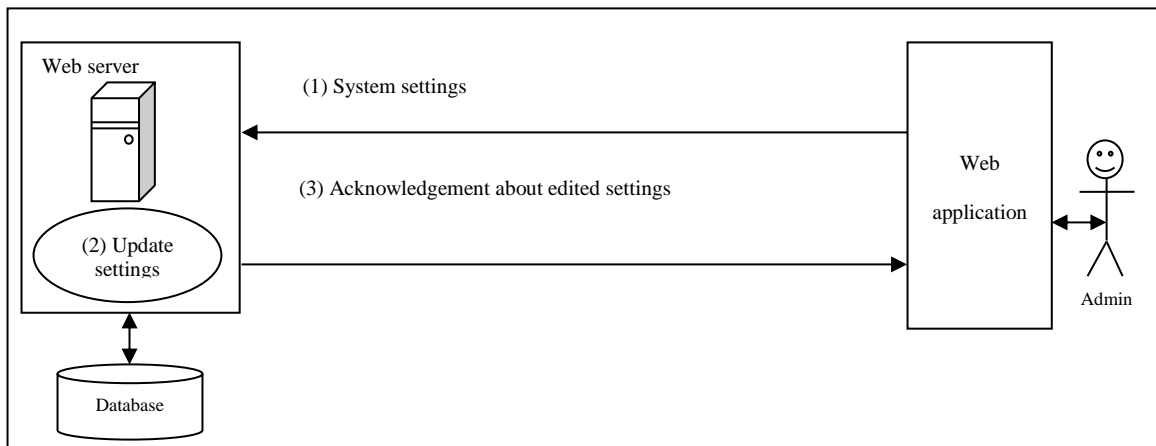


Figure 2.4: Configuration of the System Settings

## 2.2 Company Module

This module is responsible of all company's information, its products information and the communication between the company owners and their customers.

In figure 2.5, the company owner enters company information, i.e., permalink (stands for permanent link. "A permalink is a URL that links to a specific news, story or Web posting. Permalinks are most commonly used for blogs, which are frequently changed and updated. They give a specific Web address to each posting, allowing blog entries to be bookmarked by visitors or linked to from other Web sites" [9]), company logo, company name, tags, company description, number of floors of the company, background and category (it is a region specified by the company's owner and is used in assigning which product will be displayed and in which region), assigning the panoramic view of the company, and the submenu editing will be all accomplished at this stage (Process 1). The system will process this information and update the company (Process 2). The company owner updates product information such as price, color and size

(Process 3). The database will be updated (Process 4) and this is reflected in the displaying product information. The system approves the updates as successful or unsuccessful (Process 5). The company owner can send advertisements or new offers (e.g. buy one and get one for free) through e-mail. Therefore, the company's owner should enter a titled text message (Process 6). The entire e-mails of the customers will be retrieved from the database and the e-mail is send to all customers (Process 7). The operation is finalized when the acknowledgment message is received successfully or unsuccessfully back to the company owner (Process 8).

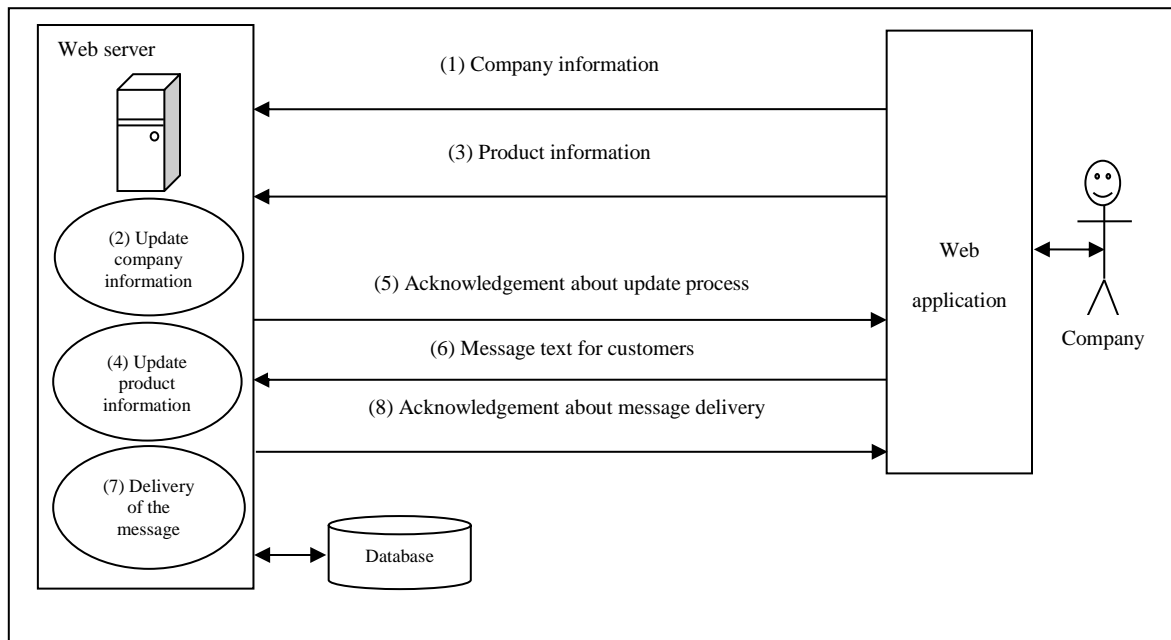


Figure 2.5: Company Management



## 2.3 User Module

This module responds to following user requests, i.e., browsing through the visual environment (the buildings and the companies whether on left side or right side of the street). Here, you can visit the company, visit each floor inside the company, browse the products of the company, view the panoramic picture and communicate with the company owner (on the main page of a company there is a contact button, when it is clicked it displays a contact form and the user can communicate with the company owner through e-mail). Figure 2.6 demonstrates how the system responds to users requests.

Firstly, users can register themselves through the home page by entering the following data: name, surname, sex, birthday, e-mail and password (Process 1). The admin approves the registration of new users, then, the system creates the self-registered user according to the entered data (Process 2) the user enters login information (e-mail and password) (Process 3). The system will authenticate the user by checking the database (Process 4). An acknowledgment message about a successfully or unsuccessfully login will be send to the user (Process 5). After that, if the login is successful then the customers' requests will be processed by the system (Process 6). The system retrieves the necessary information from the database and generates an HTML page for the user (Process 7) and, then, delivers this to the customer (Process 8).

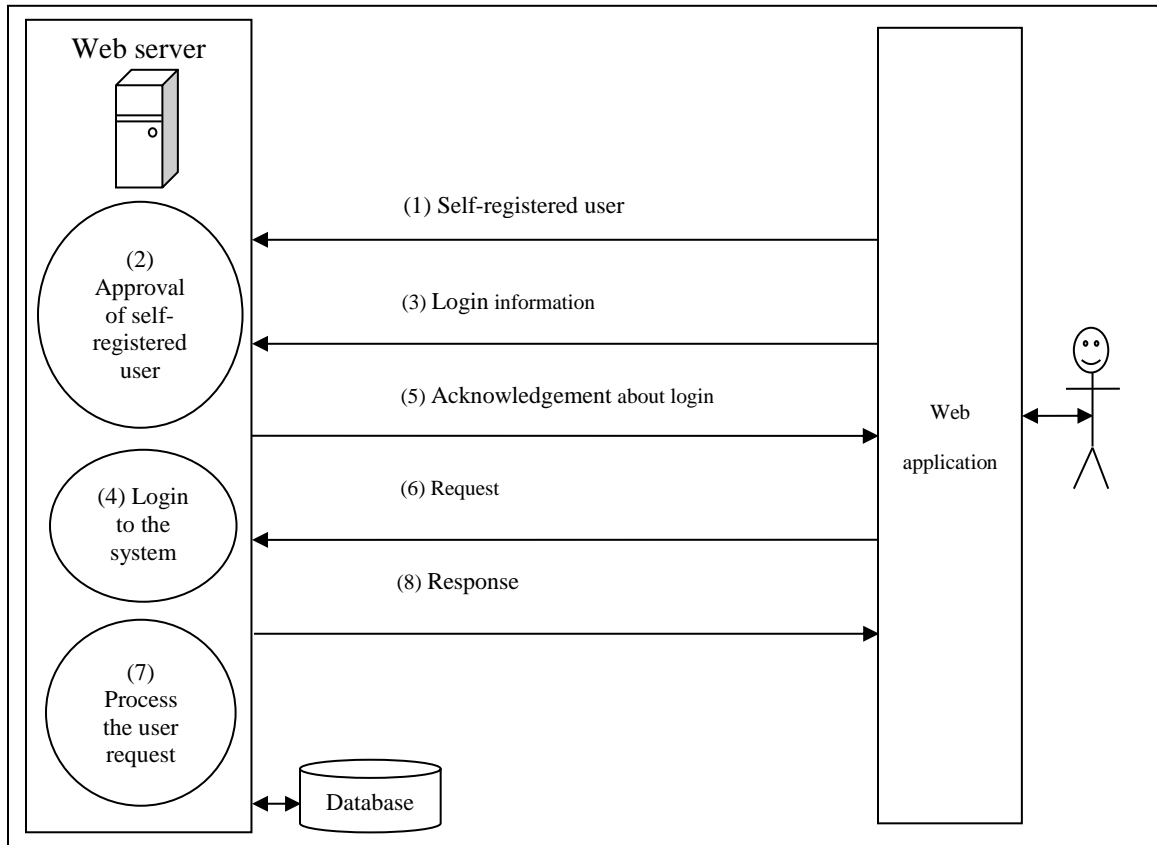


Figure 2.6: Browsing the Site

## 2.4 Use Case Modeling

In this section, the activities that can be done in the system are explained by using “use case diagrams” [10].

### 2.4.1 Actors of the System

#### 2.4.1.1 Admin Actor

- **Login/Logout:** login to the system and logout from the system.
- **Create Building:** admin can create building in the system environment.
- **Update Building:** admin can update the building information (i.e. building name, building order, and location of the building on the street).

- **Create Company:** admin can create company inside the existing building by entering company information as permalink, company title, company logo.
- **Activate Company:** admin can activate company, after the company creation is completed.
- **Deactivate Company:** admin can deactivate company.
- **Update Company:** admin can update company information.
- **Create Company Owner:** admin can create company owner in the same time with company creation.
- **All User Information:** admin is responsible for all users (create, delete, update, approve).
- **Update Site Settings:** admin can update all site settings such as site logo, site title.

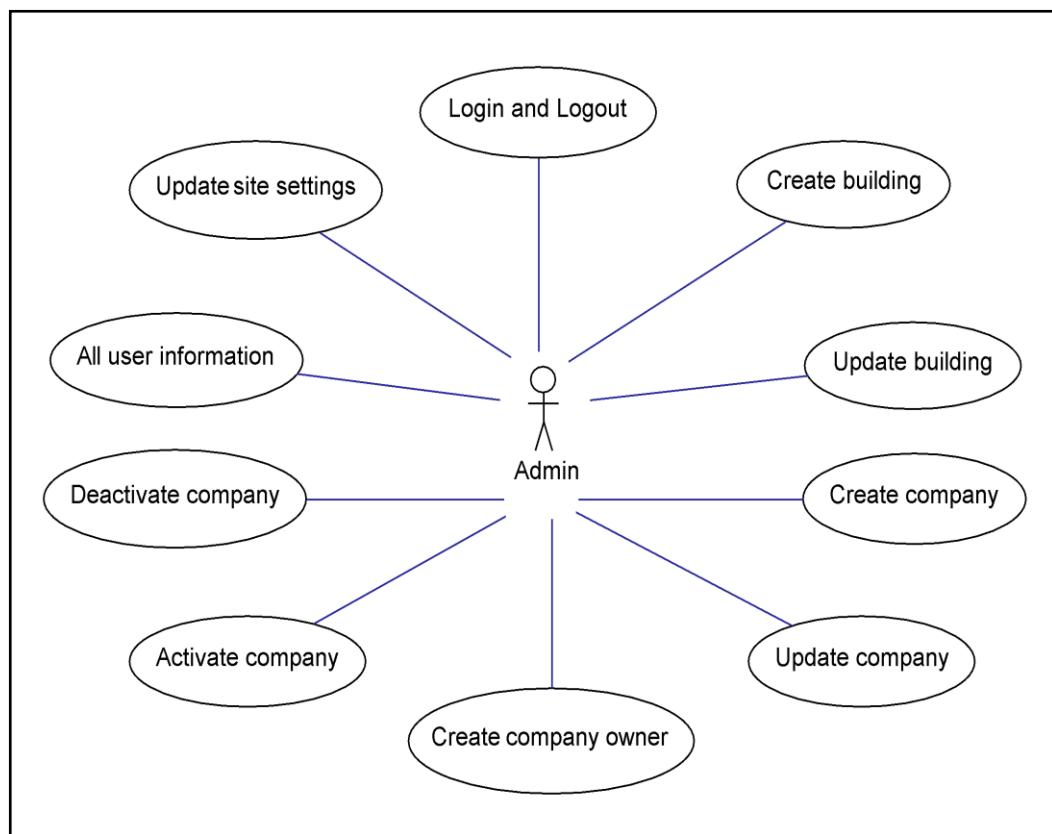


Figure 2.7: Admin Actor

### 2.4.1.2 Company Actor

- **Login/Logout:** login to the system and logout from the system.
- **E-mail to Customer:** company owner can send e-mail to specific customer who liked the company and to all customers at once.
- **Update Company:** company owner can update company information such as company logo and company title.
- **Add Floors:** company owner can add floors to the company and set a background for the floor.
- **Add Category:** company owner can add category region selected from the floor background.
- **Add Product:** company owner can add product to specific category region.
- **Update Product:** product can be updated by the company owner.
- **Add Panorama:** panoramic picture can be added to company.
- **Update Panorama:** panoramic picture can be updated by the company owner.
- **Update Profile:** company owner can update his/her profile information.
- **All Menu Information:** company owner can add extra menu link to the company home page.

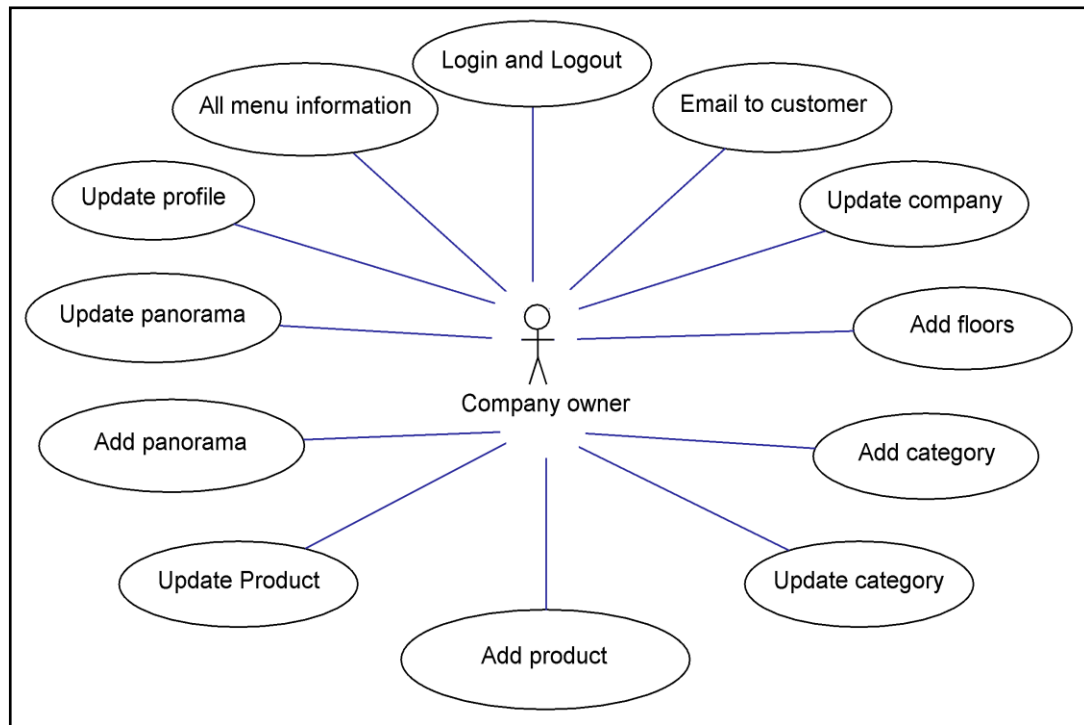


Figure 2.8: Company Actor.

### 2.4.1.3 User Actor

- **Login/Logout:** login to the system and logout from the system.
- **Create Account:** users can register themselves to the system.
- **Update Profile:** users can update their profiles.
- **Contact Admin:** users can contact with admin through e-mails.
- **Contact Company Owner:** users can contact with company owner.
- **Visit Company:** user can visit the company on the visual street.
- **View Floors of Company:** users can view each floor of the company.
- **View Product:** users can view product of the company.
- **View Panorama:** users can view panoramic picture of each company.
- **Like a Company:** users can like company to get news or offers.

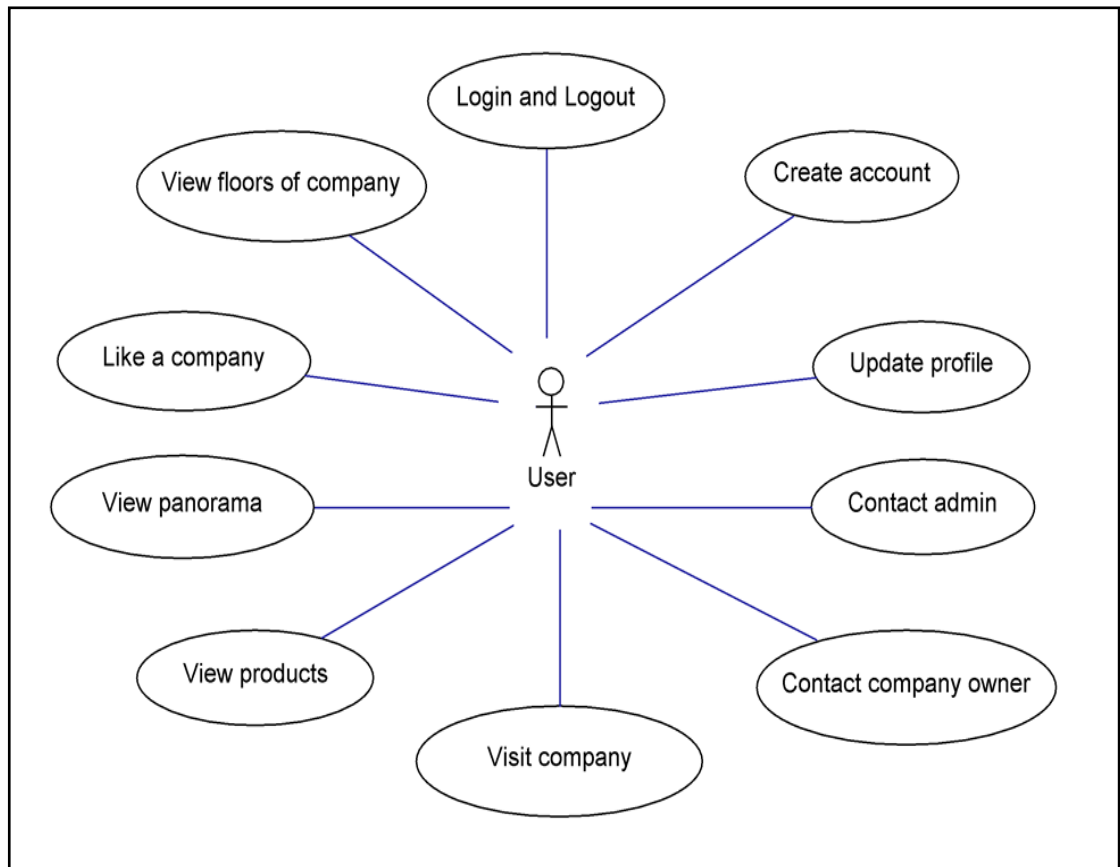


Figure 2.9: User Actor

## 2.5 Database Relationships

The designed database called ‘salamis.sql’ has been created by using phpMyAdmin. The database contains all information needed to design the system. The database will hold all buildings information, entire company’s information and related options and all users’ details. Database Entity relationship diagram is given below.

Figure 2.10 shows the database tables, fields names of these tables, primary keys\* and the relationship between the tables.

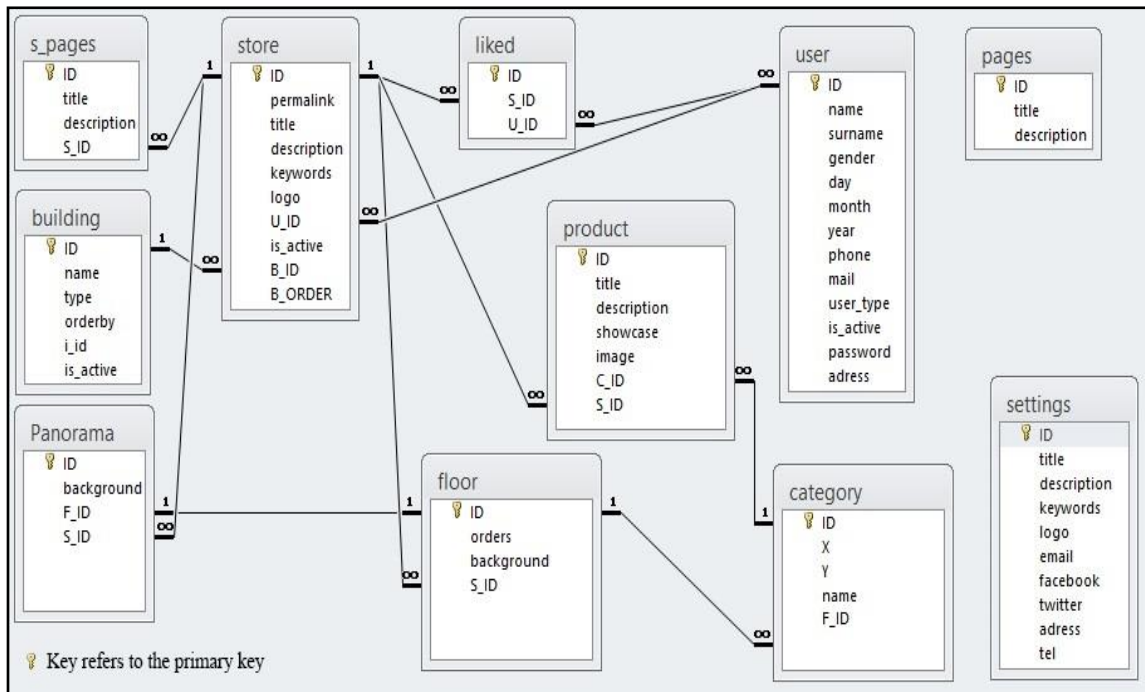


Figure 2.10: Database Entity Relationship Diagram

All tables are explained below:

The 'building' table (Table 2.1) contains all buildings' information. The 'id' field is the primary key and it is an integer. When the administrator creates a new building, the system will automatically assign a unique integer value for each new building. This value is hidden and will not appear in the system.

Table 2.1: 'building' Table

<b>Table: building</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	name	varchar(255)
	Type	int(11)
	orderby	int(11)
	i_id	int(1)
	is_active	int(1)

The 'name' field represents the building name and the 'type' field represents the values which stand for the number of companies in each building. There are thirteen types of building as shown in Table 2.2. Buildings that consist of one company are represented with values 1 to 4. The buildings that consist of two companies are represented with value 5, buildings that consist of three companies are represented with value 6, buildings that consist of four companies are represented with value 7 and buildings that consist of five companies are represented with value 8. Buildings with ten companies are represented with value 9. Buildings that consist of fifteen companies are represented with value 10. Buildings with twenty companies are represented with value 11. Buildings that consist of twenty five companies are represented with value 12. Buildings with thirty companies are represented with value 13.



Table 2.2: Building Representation Values

<b>Value</b>	<b>Its Representation</b>
1	Building consist of one company
2	Building consist of one company
3	Building consist of one company
4	Building consist of one company
5	Building consist of two company
6	Building consist of three company
7	Building consist of four company
8	Building consist of five company
9	Building consist of ten company
10	Building consist of fifteen company
11	Building consist of twenty company
12	Building consist of twenty five company
13	Building consist of thirty company

Order of the building in the visual environment is represented by ‘orderby’ field. Side of the building on the visual street is represented by ‘i\_id’ field. Value 1 refers to the building on the left side of the visual street; value 2 refers to the building on the right side of the visual street as shown in Table 2.3. The building is either active (value 1) or inactive (value 0) and it is represented by ‘is\_active’ field.

Table 2.3: Side of building values

<b>Value</b>	<b>Its Representation</b>
1	Refer that building located on the left side of the street
2	Refer that building located on the right side of the street

Admin creates a new building by entering the following information; building name, building type, building order and side of the building. The fields ‘name’, ‘type’, ‘orderby’ and ‘i\_id’ are required in creating a building and cannot be null. Note that, when admin creates a new building, the building is inactive and hidden; the building becomes active and displayed in the environment after companies are added to the building. Table ‘building’ has one-to-many relationship with ‘store’ table and the ‘id’ field has one foreign key which is ‘B\_ID’ field in ‘store’ table.

The ‘store’ table (Table 2.4) holds all the records of the company. When admin creates the company, all data are saved in ‘store’ table. Also when the company owner updates the company, all updated information is saved in ‘store’ table. The ‘id’ field is the primary key and it is a type of integer. When a company is created by administrator, the system automatically assigns a unique integer value for each company. Company permalink is the permanent name attached to the company’s URL in order to identify the company in terms of name represented by ‘permalink’ field. The company name is stored in ‘title’ field. The description of the company is stored in ‘description’ field. Furthermore, the company keywords are useful in process of search engine optimization are stored in ‘keywords’ field. The company logo is stored in ‘logo’ field and the

‘is\_active’ field represents the activeness of the company with value 1 or inactive with value 0 on the visual environment. The admin creates the new company as inactive (value 0). The company becomes active (value 1) after all company details are supported by the company owner. The ‘U\_ID’ field represents the user that owns a company and the ‘B\_ID’ field stores the ‘id’ of the building that a company located in that building. In a case of having multiple companies in the same building, the order of the company is represented by ‘B\_ORDER’ field. The table ‘store’ has one-to-many relationship with ‘floor’ table, ‘product’ table, ‘panorama’ table, ‘liked’ table and ‘s\_page’ table. The ‘B\_ID’ is a foreign key for ‘id’ field in ‘building’ table and ‘U\_ID’ is a foreign key for ‘id’ field in ‘user’ table.

Table 2.4: ‘store’ Table

<b>Table: store</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	permalink	varchar(15)
	title	varchar(225)
	description	varchar(255)
	keywords	varchar(255)
	logo	varchar(255)
<b>Foreign Key</b>	U_ID	int(11)
	is_active	int(1)
<b>Foreign Key</b>	B_ID	int(11)
	B_ORDER	int(11)

The 'floors' table (Table 2.5) holds the number of floors in each company. The 'id' field is the primary key and also it is a type of integer. The order of the floor in each company is stored in 'order' field. The background image for each floor is stored in 'background' field. Floor can have one panorama and more than one category. The 'floors' table has one-to-one relationship with 'panorama' table and one-to-many relationship with 'category' table. The 'S\_ID' is a foreign key for 'id' field in 'store' table.

Table 2.5: 'floors' Table

<b>Table: floors</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	orders	int(11)
	background	varchar(255)
<b>Foreign Key</b>	S_ID	int(11)

The 'panorama' table (Table 2.6) keeps a list of panoramic picture of each floor. When company owner add panoramic picture to his/her company, the picture information will be stored in 'panorama' table. The 'id' field is the primary key and also it is a type of integer. The picture is stored in the 'background' field. The field 'F\_ID' is used to assign the panorama to specific floor. The S\_ID field is used to assign panorama to a specific company. The 'F\_ID' is a foreign key for 'id' field in 'floor' table and the 'S\_ID' is a foreign key for 'id' field in 'store' table.

Table 2.6: 'panorama' Table

<b>Table: panorama</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	background	varchar(255)
<b>Foreign Key</b>	F_ID	int(11)
<b>Foreign Key</b>	S_ID	int(11)

The 'category' table (Table 2.7) keeps the list of all category regions in each floor of the company. The 'id' field is the primary key and also it is a type of integer. The 'X' represents the horizontal value dimension of the region icon, and the 'Y' represents the vertical value dimension of the region icon. The name of the category that appears on category will be stored in the 'name' field. The 'category' table has a one-to-many relationship with 'product' table. The 'F\_ID' is used to assign category to related floor, and the 'F\_ID' is the foreign key for 'id' field in 'floor' table.

Table 2.7: 'categories' Table

<b>Table: categories</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	X	int(11)
	Y	int(11)
	name	varchar(255)
<b>Foreign Key</b>	F_ID	int(11)

The 'product' table (Table 2.8) contains product information for instant title, image, and description. The 'id' field is the primary key and also it is a type of integer. The title of the product is stored in 'title' field. Description of the product is stored in 'description' field. The picture of a product is stored in 'image' field and showcase picture (small picture used as shortcut to the original picture of a product) is stored in 'showcase' field.

The 'C\_ID' is used to assign product to specific category. The 'S\_ID' is used to assign product to specific company. The 'C\_ID' is the foreign key for 'id' field in 'categories' table and 'S\_ID' is the foreign key for 'id' field in 'store' table.

Table 2.8: 'product' Table

<b>Table: product</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	title	varchar(255)
	description	text
	showcase	varchar(255)
	images	text
<b>Foreign Key</b>	C_ID	int(11)
<b>Foreign Key</b>	S_ID	varchar(11)

The 's\_pages' table (Table 2.9) keeps the list of the submenu of each company. The 'id' field is the primary key and also it is a type of integer. The 'title' field contains the title of the submenu. The 'description' field contains the content of the submenu. The 'S\_ID' field is used to assign the submenu to a specific company, and 'S\_ID' is the foreign key for 'id' field in 'store' table.

Table 2.9: 's\_pages' Table

<b>Table: s_pages</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	title	varchar(255)
	description	text
<b>Foreign Key</b>	S_ID	int(11)

The 'user' table (Table 2.10) holds all users information; id, name, surname, gender, day, month, year, phone, mail, password, address, user\_type and is\_active. When the users complete their registration to the system, all of their information will be saved in 'user' table. The 'id' field is the primary key and also it is a type of integer.

There are three types of users; administrator represented by value of 1, company owner represented by value of 2 and user represented by value of 3. The field 'user\_type' stores the mentioned types. The activeness of user is represented by value of 1 (active) or value of 0 (inactive) and it is stored in 'is\_active' field. The 'user' table has many-to-many relationship with 'store' table and 'liked' table.

Table 2.10: 'user' Table

<b>Table: user</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	name	varchar(255)
	surname	varchar(255)
	gender	varchar(20)
	day	int(2)
	month	int(2)
	year	int(4)
	phone	varchar(20)
	mail	varchar(255)
	user_type	int(1)
	is_active	int(1)
	password	varchar(255)
	adress	varchar(255)

The 'liked' table (Table 2.11) keeps a list of all users who liked companies. When the company owner sends an e-mail to users who are interested in his/her company, the system retrieves the information needed from the 'liked' table. Furthermore, the 'id' field is the primary key and also it is a type of integer. The 'S\_ID' field is used to specify which company has been liked. The 'U\_ID' field is used to identify which user likes the company. 'S\_ID' is the foreign key for 'id' field in 'store' table and the 'U\_ID' is the foreign key for 'id' field in 'user' table.



Table 2.11: 'liked' Table

<b>Table: liked</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
<b>Foreign Key</b>	S_ID	int(11)
<b>Foreign Key</b>	U_ID	int(11)

The 'settings' table (Table 2.12) keeps all site settings such as title, description and logo.

The 'id' field is the primary key and also it is a type of integer. Admin can update all site settings and all of the updated settings are saved in 'settings' table.

Table 2.12: 'settings' Table

<b>Table: settings</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	title	varchar(255)
	description	varchar(255)
	keywords	varchar(255)
	logo	varchar(255)
	e-mail	varchar(255)
	facebook	varchar(255)
	twitter	varchar(255)
	adress	varchar(255)
	tel	varchar(20)

Finally, the 'pages' table (Table 2.13) keeps all submenu information. The 'id' field is the primary key and also it is a type of integer. Admin can add submenu link to the home page's main menu. The text appear on the icon of the submenu is stored in 'title' field. Admin can add content to the page; the content will be stored in 'description' field.

Table 2.13: 'pages' Table

<b>Table: pages</b>		
	<b>Field Name</b>	<b>Data Type</b>
<b>Primary Key</b>	id	int(11)
	title	varchar(255)
	description	text

## **Chapter 3**

### **IMPLEMENTATION**

#### **3.1 Main Tools Used in Development Phase**

In the development phase, several tools are used. All of these tools are explained in the following sections.

##### **3.1.1 PHP**

PHP (Hypertext Preprocessor) has developed by Rasmus Lerdorf [11], and then has turned to a free software project. PHP is not a standard for the Web, but it is an open source technology. PHP is not a real programming language, but it allows people to integrate with Web pages. PHP is not a programming language as other languages, but it is a specialized language to develop sites that can be incorporated into Web pages.

##### **3.1.2 CSS**

CSS (Cascading Style Sheet) is a means or a tool used to add a design on site and it is used by Web site designers. CSS is used to edit lines, colors, background location and space of HTML page in order to appear in a specific form. (HTML is the language used to design Web page content). The CSS is a tool or a way to add design for such content. In that regard, HTML language configures the structure of Web page and CSS is designed as addition to this structure or composition. The CSS can control all details through a single file with greater capabilities and more accuracy. The use of CSS file

reduces the use of too many codes in HTML files as a font, color, background color, background image, tables and image displacement. A lot of HTML codes are saved in a single file resulting in a sharp decline in size of HTML files, which reduces the pressure on the server and display speeds dramatically.

### **3.1.3 jQuery**

The jQuery (JavaScript Query) is not an independent programming language, as some people think, contrary; it is a free library in JavaScript developed by John Resig. The 'jQuery' allows people to add fantastic effects to Web pages and makes it easy to control a lot of events for example; passing the mouse or right clicking the mouse, with few understandable codes for beginners and even to those who have not studied programming as a specialty. When a user visits a Web page that uses JQuery, he/she can view the source of this page, and he/she can see the simplicity of code and clarity in a few lines. Some of the main jQuery's third party components used in the development as follows:

- addTouch [12]: it is a used to convert touch events into simulated mouse events [12].
- DataTables [13]: it is used to add advanced interaction controls to any HTML table [13].
- FancyBox [14]: “is a tool for displaying images, html content and multi-media in a Mac-style "lightbox" that floats overtop of web page” [14].
- SliderNav [15]: this is used to add dynamic sliding content [15].
- ColorBox [16]: A customizable lightbox plugin [16].

### **3.1.4 JavaScript**

JavaScript is a language of writing scripts for the host side. It is an object oriented programming and it is used to make Web pages more dynamic. JavaScript language runs directly through the hosted browser that uses a Web browser without the need for a mediator or additional steps to send and extract information from the Web server. In terms of execution, there are two types of JavaScript language which these are client side and the server side. The first type loads the code with an HTML page and then the operations required by the user is carried out on the user machine within its own browser. The second type forces the browser to communicate with a server to execute commands and give the result to the client for the viewing. One of the JavaScript library used in the development phase is Live Validation [17] “is a small open source javascript library for making client-side validation quick, easy, and powerful” [17].

### **3.1.5 MySQL**

MySQL is an open source database system and it is used widely in building interactive Web applications, and is considered as a Relational Database Management System (RDBMS). The reason to be named like this is that the data is stored in separate tables, and is the link between these tables using special fields called primary keys and foreign keys (secondary). In general: database is used to store data (numbers, text, images, etc.) and has all the database tools and functions that enable the user to connect to database and perform operations on them (insert, update, delete, etc.).

## 3.2 The Application Developed

The “Salamis Street” application consists of three main parts; administrator, company and user modules. Each module works cooperatively in order to deliver information about the companies and their products. In the implementation stage, Web application is developed to create an environment for modules in order to operate.

The home page in figure 3.1 is initially seen by the admin, company owner and the user who visits the site.



Figure 3.1: Home Page

The home page consists of

1. Header part; contains site logo and main menu.
2. Body part; contains the street, buildings, companies, left control and right control to scroll the street.
3. Footer part; contains footer menu and rotate icon for rotating the street to view the right and left side.

### **3.2.1 Admin Management Panel**

After admin logs in to the site, the management panel will be displayed. In the management panel admin can:

- Create and edit buildings.
- Add and edit companies.
- Add user to the system.
- Confirm self-register user and edit user information.
- Add new submenu to the home page main menu and edit their content.
- Add new admin to the system.
- Update his/her own information.
- Update site settings.

Figure 3.2 demonstrates the management panel for admin.

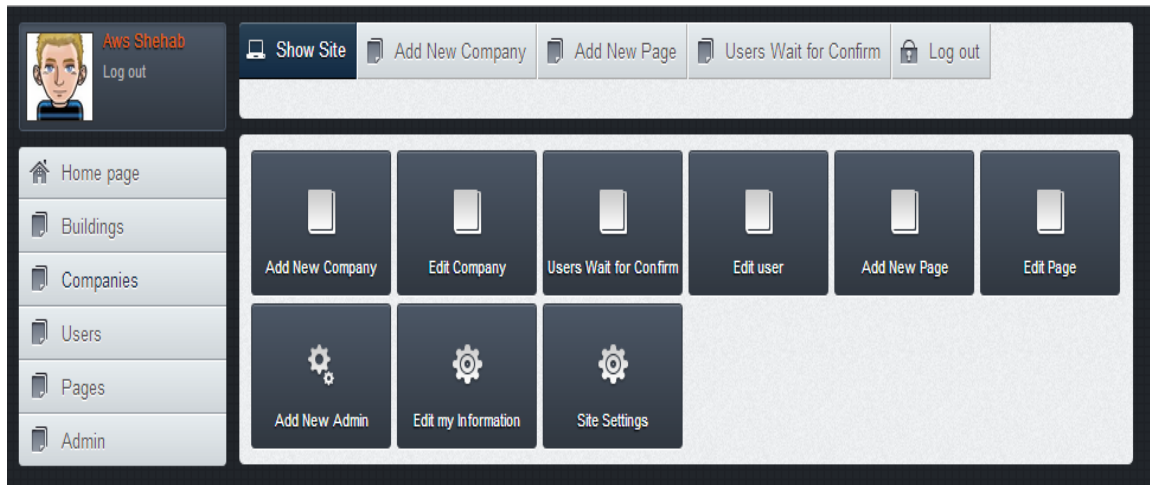


Figure 3.2: Admin Management Panel

Management panel is consisted of the main menu in the left of the panel, header menu in the top, and the icons in the middle which are the shortcuts to the same functions in the main menu. The items of the main menu of the panel are explained with all the details in the following sections.

### 3.2.1.1 “Home page” Menu Item

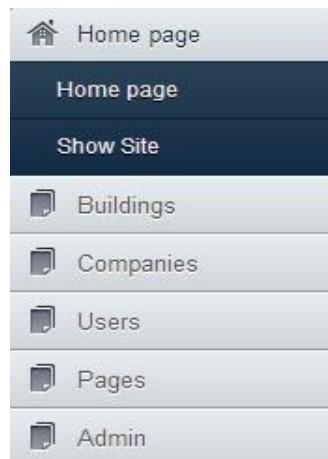


Figure 3.3: ‘Home page’ Menu Item



As it is seen in figure 3.3, 'Home page' is the first item of the menu and contains two sub items; first one is the 'Home page', by clicking on this item it will redirect to the main menu of the admin management panel. The second one is the 'show site', by clicking on this item; it will lead to the Web site's main page.

### 3.2.1.2 "Buildings" Menu Item

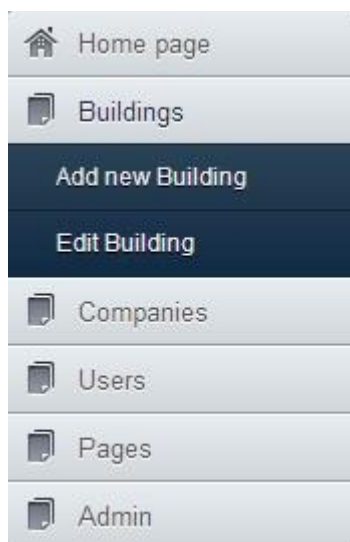






Figure 3.4: 'Buildings' Menu Item

As it is shown figure 3.4 'Buildings' is the second item of the menu. By clicking on this item, admin can create buildings, edit building information and delete building. When admin clicks on 'Add new Building' the page in figure 3.5 will appear.





**Building Information**

**Building name**

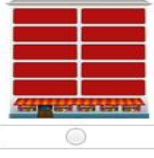
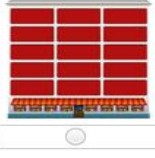
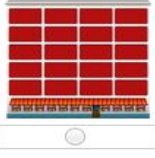
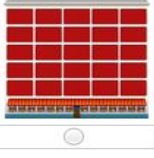
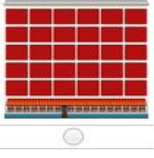
**One company per building**

			
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**More than one company per building**

			
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Expanded Buildings**

				
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Please select the side of the Building**

Left  Right

**Building order**

Figure 3.5: Building Creation

Admin can add a building to the environment by entering ‘Building name,’ selecting building type, choosing ‘side of the building’ right or left’ and entering the ‘Building order.’ When admin creates new buildings, several fields e.g. the name of the building, type of the building and sides of the building are required. In a case of admin does not enter one of these fields, the system will alert the admin by showing the alert message as shown in figure 3.6.

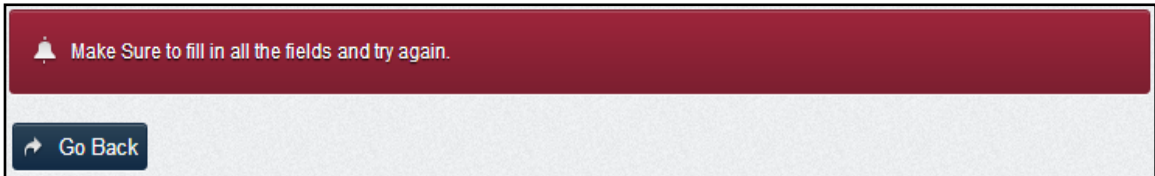


Figure 3.6: Alert Message

After that, when admin clicks on the ‘Add Building’ icon, the system will save the entered information and the building will be added to the system and the message in figure 3.7 will appear.



Figure 3.7: Building Added to the System Message

When admin edits the building, firstly the ‘Edit Building’ item must be clicked, and then admin must select which building to be edited. Figure 3.8 shows the process.

🔔 If you delete a building, the building will delete all the connected companies.

🔔 After you add a building,you can not change building type !

🔔 you can increase just the building which contain 5 floors

### Edit Building

Show **10** entries Search:

#	Building name	Increase	Decrease	Edit	Delete
35	Building 1	⬆️	⬇️	✎	🗑
36	Building 2	⬆️	⬇️	✎	🗑
37	Building 3	⬆️	⬇️	✎	🗑
38	Building 4	⬆️	⬇️	✎	🗑
39	Building 5	⬆️	⬇️	✎	🗑
42	Building 6	⬆️	⬇️	✎	🗑
43	Building 7	⬆️	⬇️	✎	🗑
44	Building 8	⬆️	⬇️	✎	🗑
45	Building 9	⬆️	⬇️	✎	🗑
55	Test1	⚡	⚡	✎	🗑

Showing 1 to 10 of 10 entries First Previous **1** Next Last

Figure 3.8: Building Selection for Editing

In the previous figure there were three messages. The first message gave information to the admin that if the building is deleted then all companies inside of this building will be deleted also. The second message informed that, after the building is created, the type of the building cannot be changed. Lastly, Third message informs admin that only buildings that consist of five floors can be extended.

After admin selects the building for editing, the page in figure 3.9 will appear.

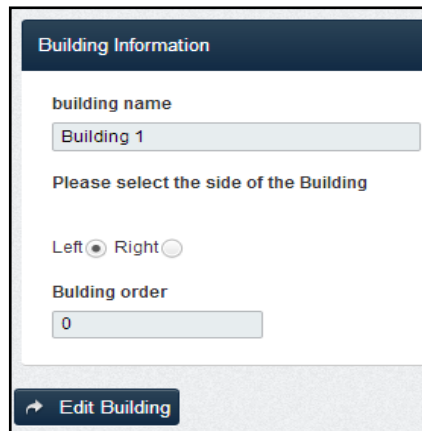
A screenshot of a web form titled "Building Information". The form has a dark blue header with the title. Below the header, there are three input fields: "building name" with the value "Building 1", "Please select the side of the Building" with radio buttons for "Left" (selected) and "Right", and "Building order" with the value "0". At the bottom of the form is a dark blue button with a white arrow and the text "Edit Building".

Figure 3.9: Editing Building Information

Admin can edit the 'building name', the 'side of the building on the visual street' and the 'Building order'. Finally, all the edited information will be updated and the message in figure 3.10 will appear.



Figure 3.10: Building Updated Message

### 3.2.1.3 "Companies" Menu Item

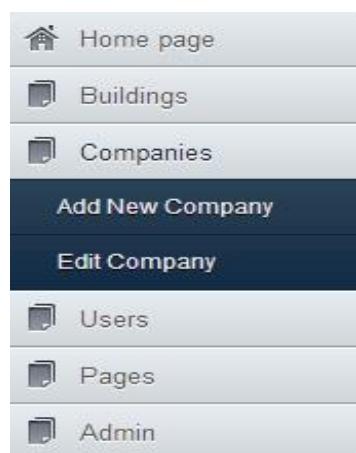


Figure 3.11: 'Companies' Menu Item

As it is seen in figure 3.11, third item of the menu is the ‘companies’. By clicking on this item, admin can add company, add company owner, edit company information, delete company and activate or inactivate company.

When company owner clicks on ‘Add New Company’, the page in figure 3.12 will appear. In the top of the page there is an alert message which informs the admin that ‘the company cannot be active until required company information is entered by the company’s owner. Also the system will send an automatic e-mail to the company owner to approve that the company has been opened. Adding company consists of two parts which these are company information and company owner information.

Initially, when admin adds a new company, ‘Select the building’, ‘Select the place for the company’, ‘Permalink’, ‘Company Title’, ‘Company Description’, ‘Company Tags’ and ‘Company Logo’ must be filled. Again in a case of admin forgets to enter one of these fields the alert message in figure 3.6 will appear. The figure below shows the page of adding company information.

company owner, the company can not be active until you enter the required information on the company! after Company is opened automatic e-mail sent to the owner of the company through the system.

### Add New Company

#### Company Information

**Select Building**  
Building 1

**Select the place for the company**  
Select

**Permalink**

**Company Title**

**Company Description**

**Company Tags**

**Company Logo**  
No file selected

Figure 3.12: Adding Company to the System

After entering the company information, admin will enter company owner information. 'Name', 'Surname', 'Mobile Number', 'Address', 'E-Mail Address' and 'Password' must be filled in order to create the company owner and all of the mentioned field are required to complete the process. Figure 3.13 shows the page of adding company owner information.

Company Owner Information

Name

Sure name

Mobile Number

Address

E-Mail Address

Password

[Add New Company](#)

Figure 3.13: 'Company Owner Information' Page

After admin clicks on 'Add New Company', the system will create the company as well as the owner of the company in parallel and the message in figure 3.14 will appear.



Figure 3.14: Company Added to the System Message

In a case of not filling one of the company owner information fields, the alert figure 3.6 will appear to notify the admin to fill the missing field/fields.



The system also validates the entered e-mail and checks the database if the entered e-mail is previously saved in the database. In that case the alert message in figure 3.15 will appear to the admin.

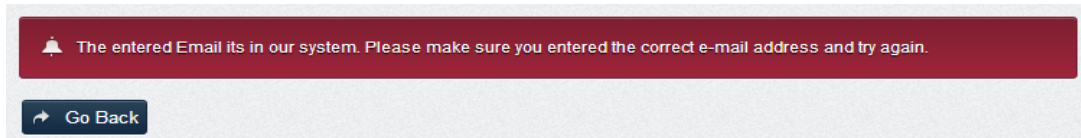


Figure 3.15: Incorrect E-mail Message

Admin can edit companies by clicking on 'edit company' icon. Figure 3.16 will appear.

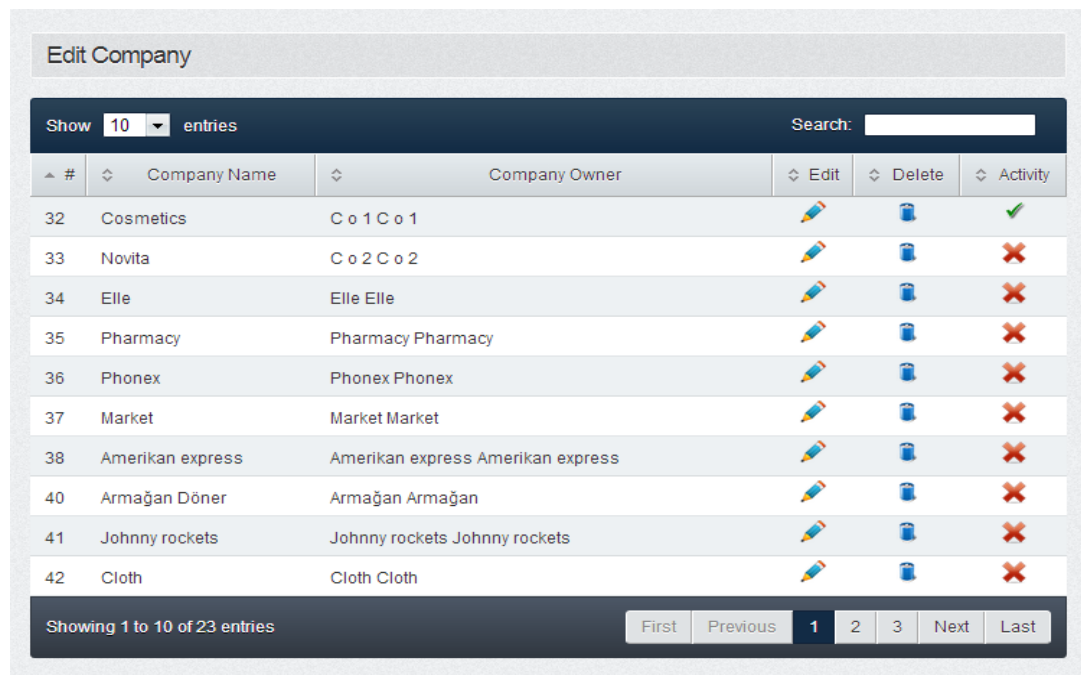



Figure 3.16: Selection of Company for Editing

Admin selects which building to edit by clicking on the 'edit' icon , then, both of figures 3.12 and 3.13 will appear. All fields can be edited. Also admin can delete a company by clicking on 'delete' icon for the building that wants to be deleted. Moreover, admin can activate or inactivate companies, by clicking on 'red x' button

✘ to inactivate or clicking on ‘green tick’ button ✔ to activate the company. When admin clicks on ‘edit’, all updated information will be saved to the system and the message in figure 3.17 will be displayed.

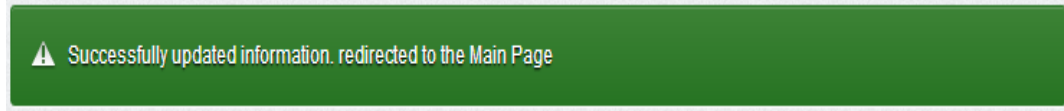


Figure 3.17: Information Updated Message

#### 3.2.1.4 “Users” Menu Item

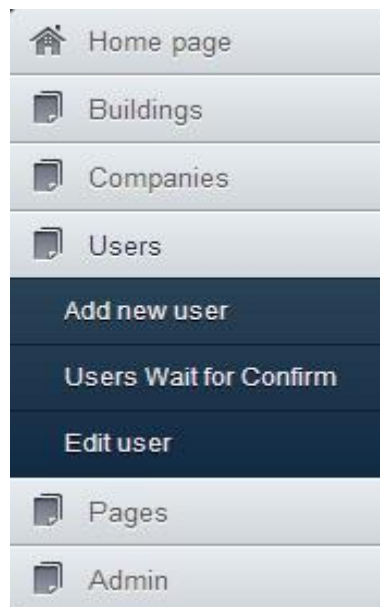


Figure 3.18: ‘Users’ Menu Item

As it is seen in figure 3.18, ‘Users’ is the fourth item of the menu. Admin can add users to the system; can confirm the self-register users and also can edit user’s information. When admin clicks on ‘Add new user’ the page in figure 3.19 will appear.

Add new user

User Information

Name  Required field!

Sure name

E-Mail Address

Password

Go Back Add New User

Figure 3.19: New User Registration

Admin enters 'name', 'surname', 'e-mail address' and 'password' information. All of these fields are required to add user to the system. If admin does not fill one of the field's, then alert message in figure 3.6 will appear. After filling all fields, admin clicks on 'Add New User' icon and the system will check the database for entered e-mail, if the entered e-mail is already in the system the alert message in figure 3.20 will appear.

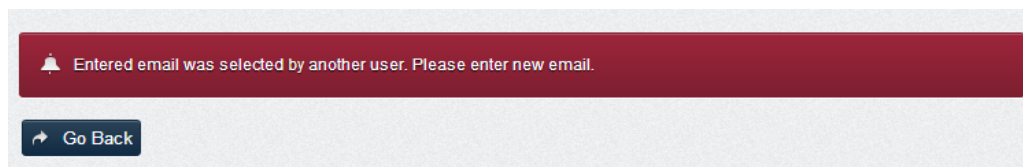


Figure 3.20: E-mail Used by Another User Message

If not, the system will add the user to the system and the message in figure 3.21 will appear to the admin.



Figure 3.21: User Added to System Message

Admin can confirm self-registered user by clicking on ‘user wait for confirm’ and figure 3.22 will appear.

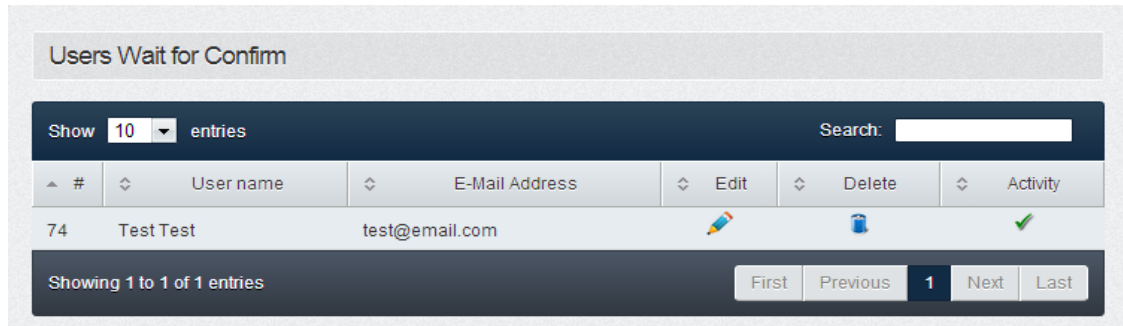


Figure 3.22: Confirmation of Users




By clicking on ‘green tick’ button , the user will be approved and his/her access to the system will be allowed. Moreover, admin can also delete a user by clicking on the ‘delete’ icon . For editing user, admin clicks the ‘edit’ icon  for the user that wants to be edited and the page in figure 3.23 will be displayed.

Figure 3.23: Editing User Information

When admin clicks on 'edit', all information will be saved and the message in figure 3.17 will appear.

### 3.2.1.5 "Pages" Menu Item

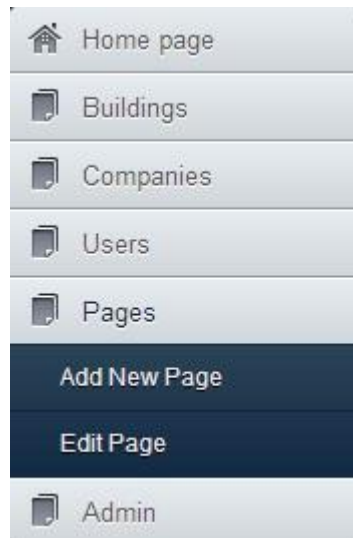


Figure 3.24: 'Pages' Menu Item

In figure 3.24, Admin can add submenu to the main menu of the Web site, and then can edit and delete the submenu. When admin clicks on 'Add New Page' the page in figure 3.25 will be displayed.

Add New Page

Add New Page

Page Name

page description

**B** *I* U ABC | |

➔ Add

Figure 3.25: Adding New Page

Admin enters the ‘Page name’ and ‘page description’ in order to create a submenu. The ‘Page name’ field is required to create the submenu. After filling the fields, admin clicks on ‘Add’, then the system will save the entered information and will add submenu item to the main menu. After that, the message in figure 3.26 will appear to indicate that submenu has been added successfully.



Figure 3.26: Page Added Message

If admin does not fill the ‘page name’ field, the message in figure 3.6 will appear.

Admin can edit submenu by clicking on ‘Edit page’, then, selecting the submenu that wants to be edited and finally then clicking on the ‘edit’ icon. The page in figure 3.27 will display the process.

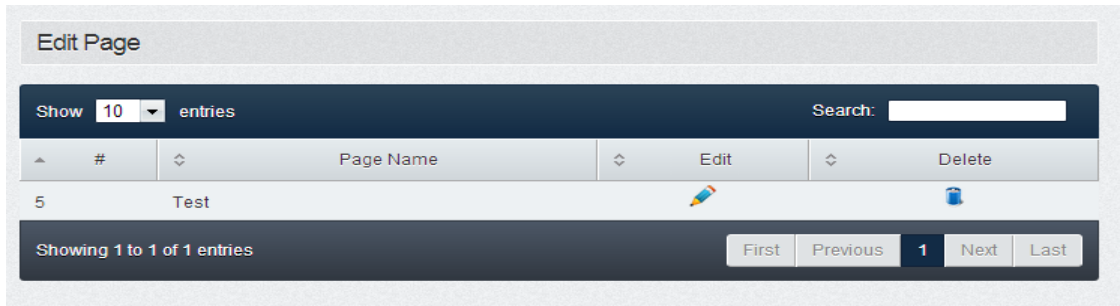


Figure 3.27: Selection of Page for Editing


After clicking on the 'edit' icon  the figure 3.25 will appear, this will allow admin to edit content of the submenu. Admin clicks on 'edit' to finish the process and the message in figure 3.28 will appear to ensure that submenu is updated.



Figure 3.28: Page Updated Message

### 3.2.1.6 "Admin" Menu Item

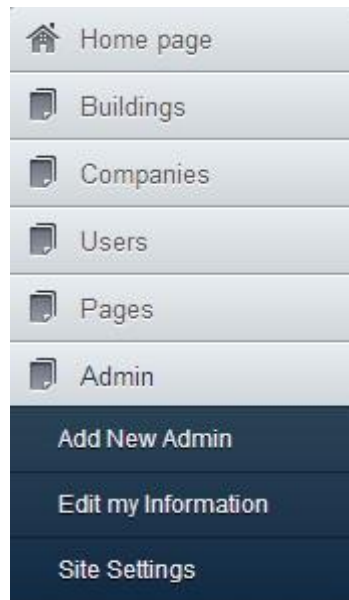


Figure 3.29: 'Admin' Menu Item

As it is shown in figure 3.29, 'Admin' is the last item of the menu. Admin can add new admin to the system, update his/her own information and update Web site settings.

Existing admin can add new admin to the system by clicking on the 'Add New Admin'. The page in figure 3.30 will be displayed.

The screenshot shows a web form for adding a new admin. The form is titled "Add new admin" and is contained within a light gray border. At the top, there is a dark blue header bar with the text "User Information" in white. Below this, the form contains several input fields: "Name" (with a "Required field!" error message), "Surname", "Mobile Number", "Address" (a large text area), "E-Mail Address", and "Password". At the bottom of the form, there is a dark blue button with a white arrow and the text "Add New Admin".

Figure 3.30: Creation of New Admin

Admin fills 'Name', 'Surname', 'Mobile Number', 'Address', 'E-mail address', and 'Password' in order to add a new admin. All of the mentioned fields except the 'address' fields are required to accomplish this process. Then, admin clicks on 'Add New Admin' and the system saves entered information and the message in figure 3.31 will be displayed.





Figure 3.31: Admin Added to the System Message

In a case that the entered e-mail is already in the system the message in figure 3.20 will appear.

Admin can also edit his/her own information by clicking on 'Edit my information' and the page in figure 3.32 will appear to the admin.

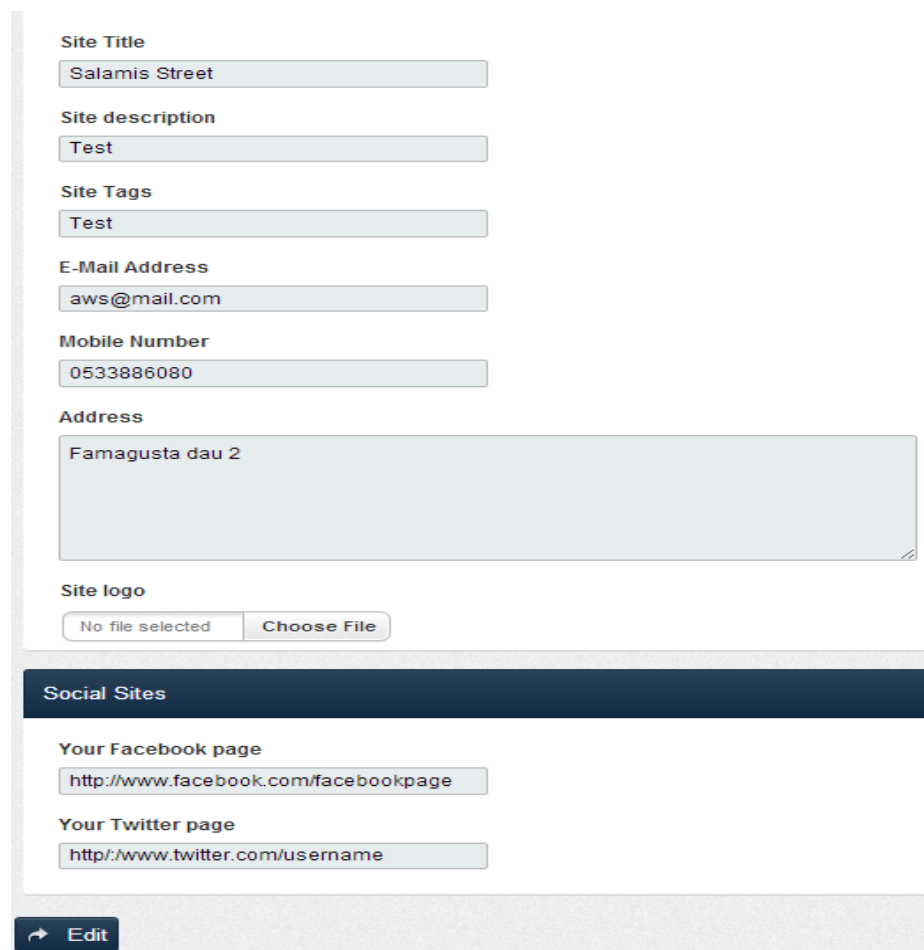
A user information editing form with the following fields and values:

- Name**: Text input field containing "Aws"
- Sure name**: Text input field containing "Shehab"
- Sex**: Dropdown menu with "Male" selected
- Birthday**: Three dropdown menus for day, month, and year, containing "28", "3", and "1988" respectively
- Mobile Number**: Text input field containing "05338886080"
- Address**: Text area containing "Famagusta"
- E-Mail Address**: Text input field containing "aws@mail.com"
- Password**: Text input field containing "1988"

At the bottom left, there is a dark blue button with a white arrow icon and the text "Edit".

Figure 3.32: Editing Admin Information

Admin can edit all fields by clicking on the 'edit' icon. The system will update the information of these fields and then will display the message in figure 3.17 in order to ensure that information is updated. Finally, admin can edit the Web site settings. When admin clicks on 'Site Settings', the page in figure 3.33 will be displayed.



The screenshot displays a 'Site Settings' form with the following fields and sections:

- Site Title:** Text input field containing 'Salamis Street'.
- Site description:** Text input field containing 'Test'.
- Site Tags:** Text input field containing 'Test'.
- E-Mail Address:** Text input field containing 'aws@mail.com'.
- Mobile Number:** Text input field containing '0533886080'.
- Address:** Large text area containing 'Famagusta dau 2'.
- Site logo:** File upload section with a 'No file selected' status and a 'Choose File' button.
- Social Sites:** A dark blue header section containing:
  - Your Facebook page:** Text input field containing 'http://www.facebook.com/facebookpage'.
  - Your Twitter page:** Text input field containing 'http://www.twitter.com/username'.
- Edit:** A dark blue button with a right-pointing arrow icon, located at the bottom left of the form.

Figure 3.33: Site Settings

All fields can be edited. After admin completes the editing process, 'Edit' icon must be clicked to finish the process. The message in figure 3.34 will be displayed to indicate that the site settings are updated.



Figure 3.34: Settings Updated Message

### **3.2.2 Company Owner Management Panel**

There is a specific management panel for the company owner(s) displayed after he/she logs in to the system. Company owner can edit all company information, add floors to the company, edit floors, manage category regions, add products and update their information, add panorama view to each floor, add submenu to the company's main menu, send e-mails to the users who are interested in the company and finally company owner can also update his/her information.

After company owner logs in to the system, company owner management panel figure 3.35 will appear. Company owner management panel has the same structure with the management panel of the admin.

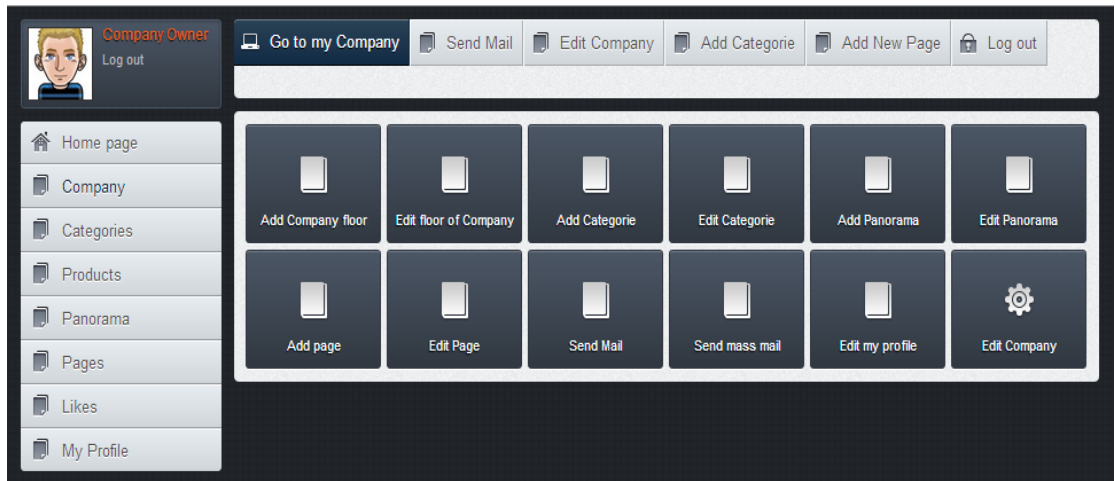


Figure 3.35: Company Owner Management Panel

The items of this panel will be shown in details in the following sections.

### 3.2.2.1 “Home page” Menu Item

The ‘Home page’ (figure 3.36) is the first item of the menu consisting of two submenus. First submenu is called ‘Home page’. By clicking on this item it will redirect to the main menu of the company owner panel, by clicking on the second submenu ‘Go to my Company’ will lead to the company’s main page.

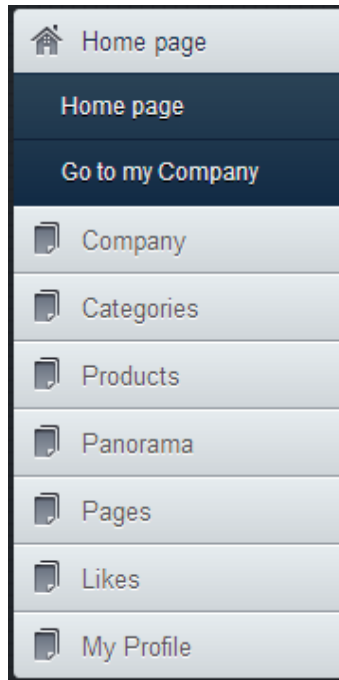


Figure 3.36: 'Home page' Menu Items

### 3.2.2.2 "Company" Menu Item

In this item, company owner can edit company, add floors to the company and update them.

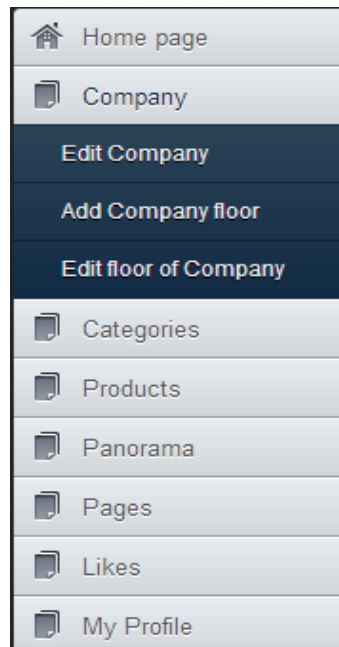


Figure 3.37: 'Company' Menu Item

As it is shown in figure 3.37, Company owner can edit the company by clicking on the ‘Edit Company’ icon. Company owner can edit ‘Company Title’, ‘Company Description’, ‘Company Tags’, and ‘Company Logo’. For company logo, dimensions must be with range of (width 383, height 145). Figure 3.38 shows the details of the editing process.

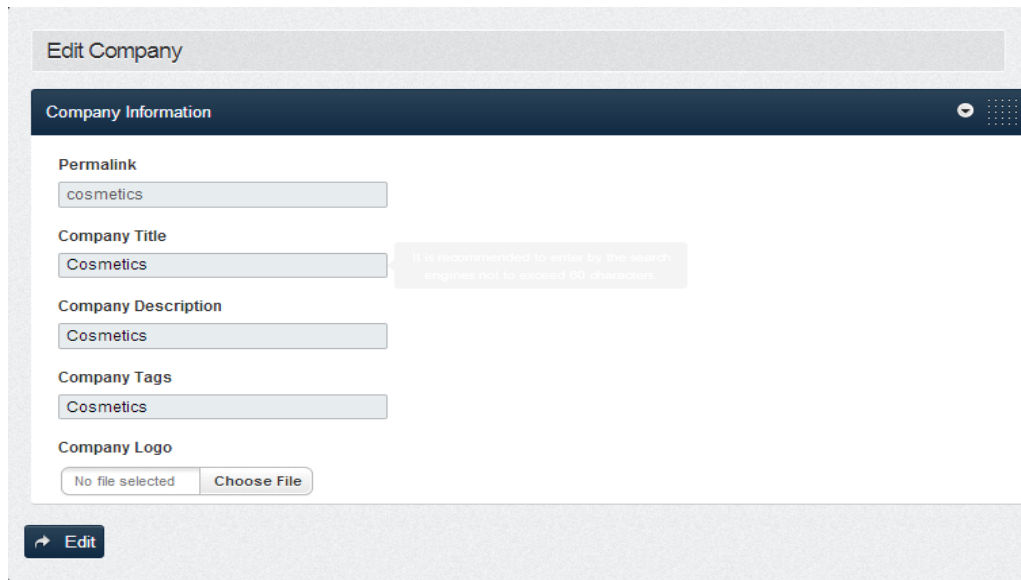


Figure 3.38: Editing Company

After company owner clicks on the ‘Edit’ icon, the system will be updated and information will be saved to the database. The message in figure 3.39 will appear to indicate that the process has completed successfully.

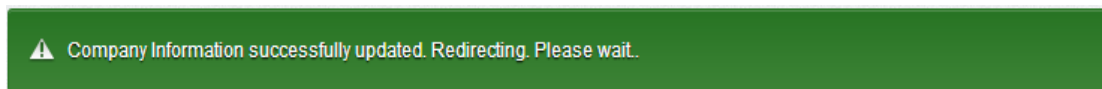


Figure 3.39: Information Updated Message

If company owner does not fill one of the fields, the alert message in figure 3.40 will be displayed.

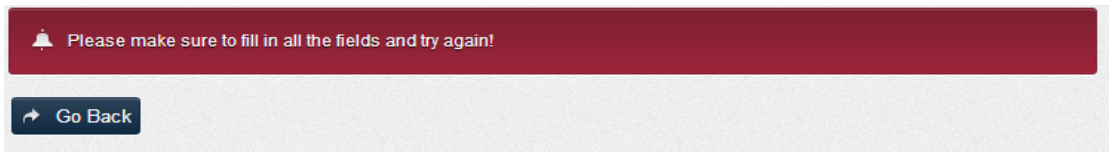


Figure 3.40: Alert Message

Company owner can add floors to the company by clicking on the 'Add Company floor' icon. The page in figure 3.41 will appear.

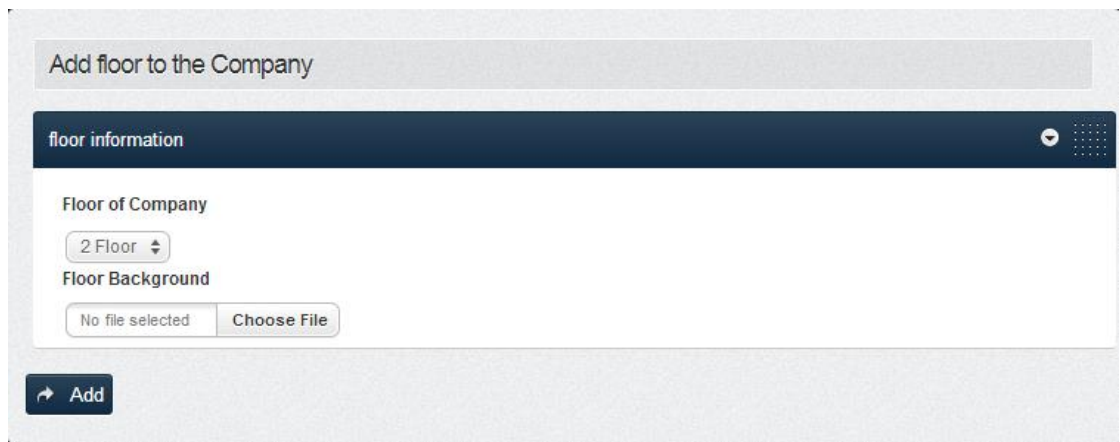


Figure 3.41: Adding Floor to a Company

Company owner can select the floor number from the 'Floor of company' item. Then he/she assigns a background to that floor by clicking on the 'Floor Background' item. System saves the entered information and figure 3.42 will be displayed to indicate that the floor has been added successfully.



Figure 3.42: Floor Added Message

In a case of admin does not choose the floor background, figure3.6 will appear as a message to notify the company owner to choose an image.

Company owner can edit the floors of the company by clicking on the ‘Edit floor of Company’ item. Then edit page figure 3.44 will be displayed.

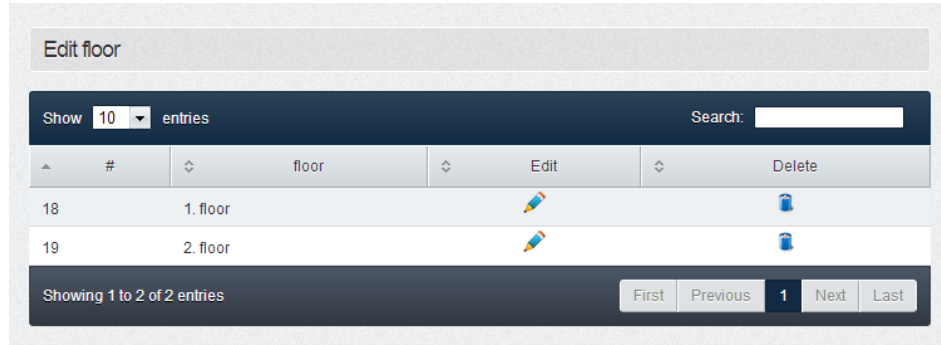


Figure 3.43: Floor Selection for Editing

Company owner can delete the floor by clicking on the ‘delete’ icon for the floor that wants to be deleted. Company owner can select which floor to be edited by clicking on the ‘edit’ icon, then, the system will display the page in figure 3.44.

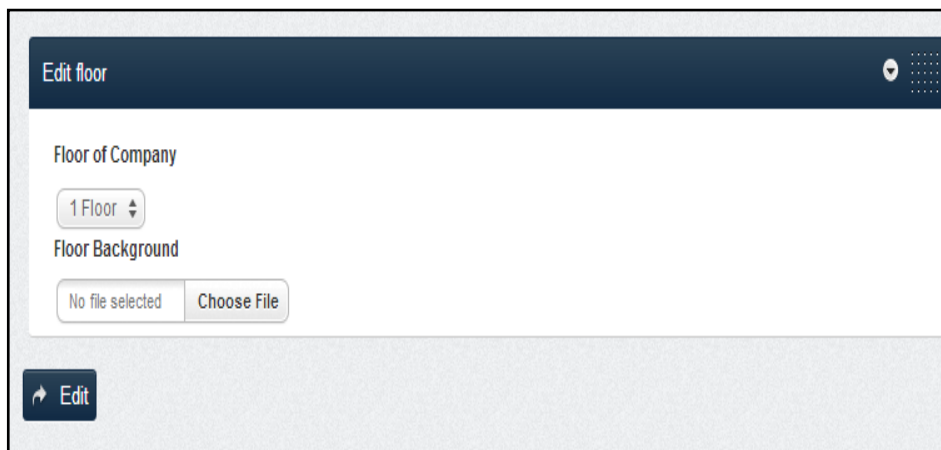


Figure 3.44: Editing Floor



Company owner can select which floor to be edited from the ‘Floor of Company’ list and then choose the background for that floor from ‘Floor Background’ icon. When company owner clicks on the ‘Edit’ icon, system will save the updated information and will display a successful message in figure 3.45.



Figure 3.45: Floor Updated Message

### 3.2.2.3 “Categories” Menu Item

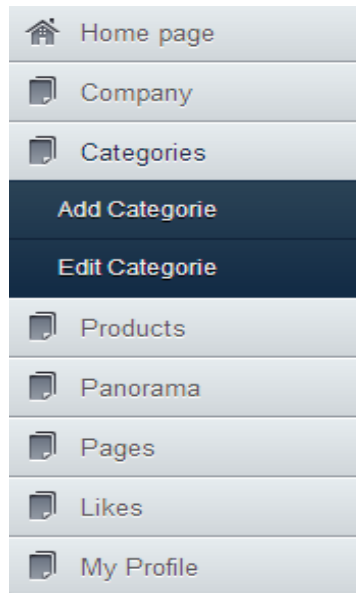


Figure 3.46: ‘Categories’ Menu Items

As it is seen in figure 3.46, ‘Categories’ is the third item of the menu. Company owner can add category regions to a company by clicking on to ‘Add Categories’ icon. There are several steps that will be explained in figures 3.47, 3.48.

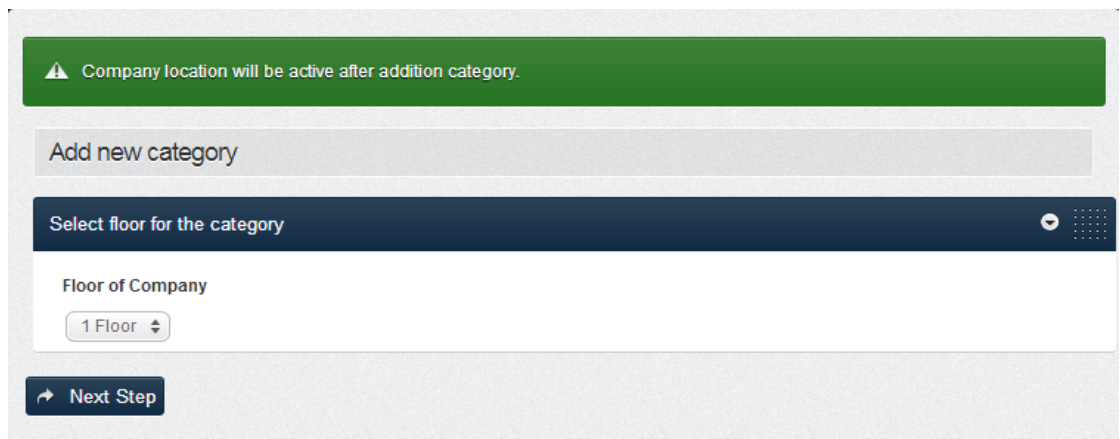


Figure 3.47: Adding New Category Regions

Note that the alert message in figure 3.74, informs the company owner that his/her company will be visible after he/she places the category regions.

Firstly admin chooses which floor to add category regions from 'Floor of Company'. After clicking on the 'Next Step', system will display floor background figure 3.48.

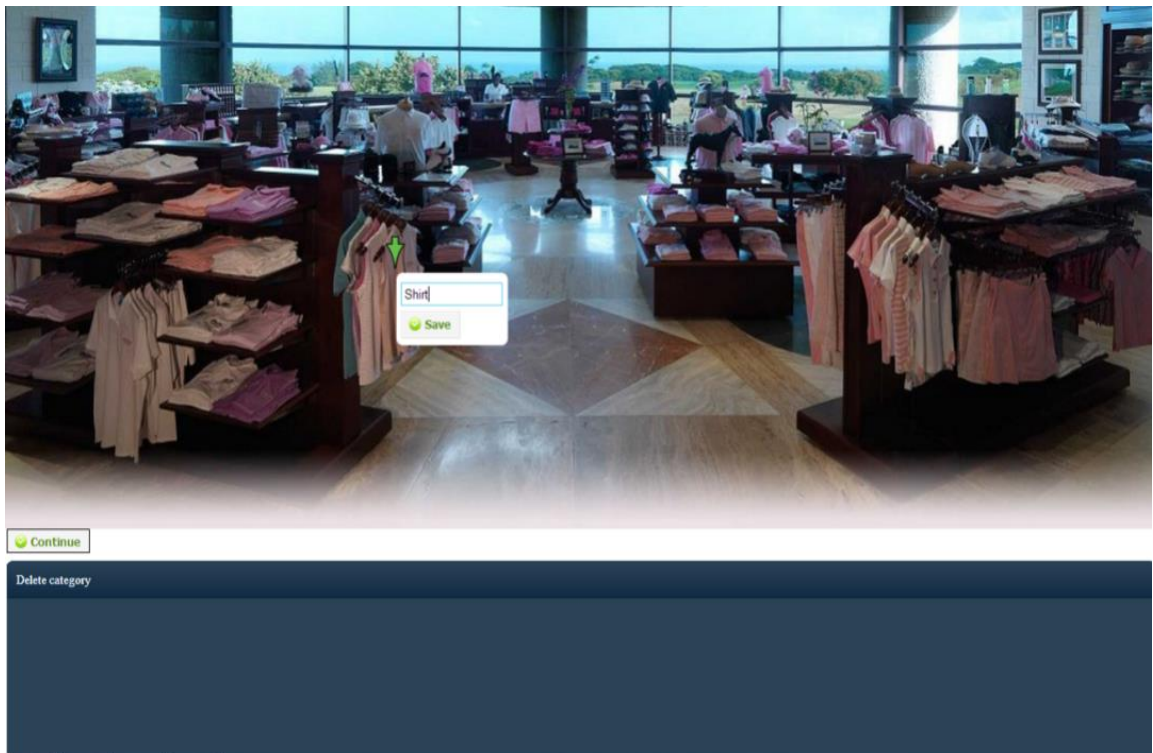


Figure 3.48: Choosing Regions

Company owner can click anywhere on the floor background to select place for the category. After that, he/she can enter the name of the category, then, click on the ‘Save’ icon. By clicking on the ‘continue’ icon, the system will save the information of entered regions to the database. Then, the system will display a success message in figure 3.49 to approve that process is completed.

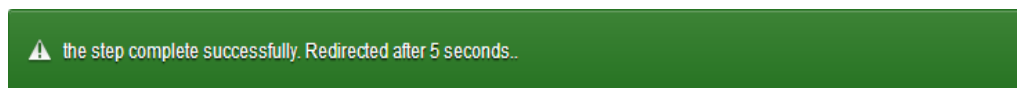


Figure 3.49: Step Completed Successfully Message

For editing categories, company owner clicks on the ‘Edit Categories’ icon. The page in figure 3.50 will be displayed.

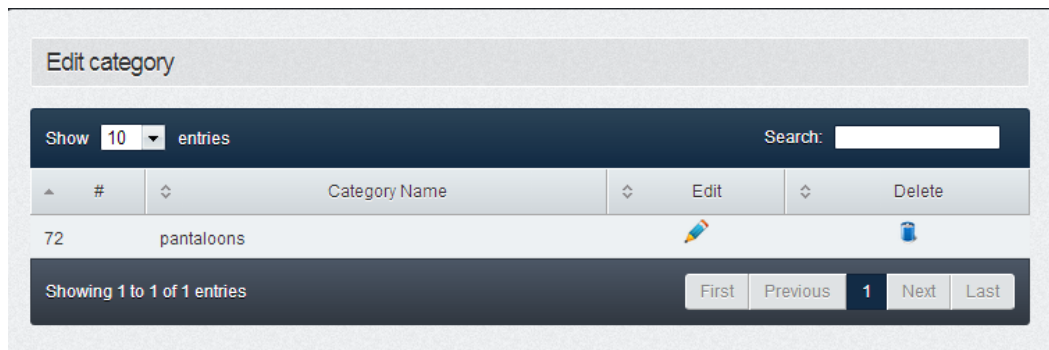


Figure 3.50: Category Selection for Editing

Company owner can delete category by clicking on the ‘delete’ icon. By clicking on the ‘edit’ icon, the page in figure 3.51 will be displayed.



Figure 3.51: Editing Category Region

The red arrow indicates the place of current categories. When the company owner clicks anywhere on the image, the 'green arrow' will appear to assign the new place of that region. After that, company owner will click on the 'Continue' icon to complete the editing process. System will display a success message figure 3.49.

### 3.2.2.4 “Products” Menu Item

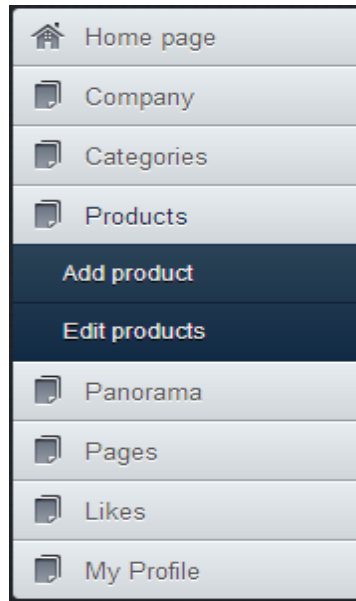


Figure 3.52: ‘Products’ Menu Item

The ‘Products’ is the fourth item of the menu as it is shown in figure 3.52. Products can be added to the company by clicking on the ‘Add product’ icon. Then system will display ‘Add New Product’ page in figure 3.53.

The screenshot shows a web form titled "Add new product". It contains the following elements:

- Product title:** A text input field containing "LC Waikiki".
- Product category:** A dropdown menu with "Shirt" selected.
- Product Description:** A rich text editor with a toolbar and placeholder text: "color : ####", "price : ####", "model : ####", and "and so on .....". The status bar shows "Path: p" and "Words:6".
- Product picture:** A field containing "cosmetics.png" and a "Choose File" button.
- Submit:** An "Add" button at the bottom left.

Figure 3.53: Adding New Product

First of all, the company owner must enter the ‘Product title.’ Then ‘Product category’ must be chosen in order to assign the new product to a category. For product details, company owner can add whatever he/she wants from a rich text box. Finally, company can add ‘Product picture’ by clicking on ‘Choose File’ icon. Note that, multiple images can be selected by pressing on the ‘CTRL’ on the keyboard while choosing images. All the fields are required to add a new product.

After entering all product information, company owner must click on the ‘Add’ icon to conclude the process. Then, the system will display a message in figure 3.54 to indicate that the product has successfully added.



Figure 3.54: Product Added Message

In a case that company owner does not fill in one of the field's, then alert message figure 3.6 will be displayed to alarm the company owner.

Company owner can also edit products by clicking on the 'Edit product.' Edit product page in figure 3.55 will be displayed.

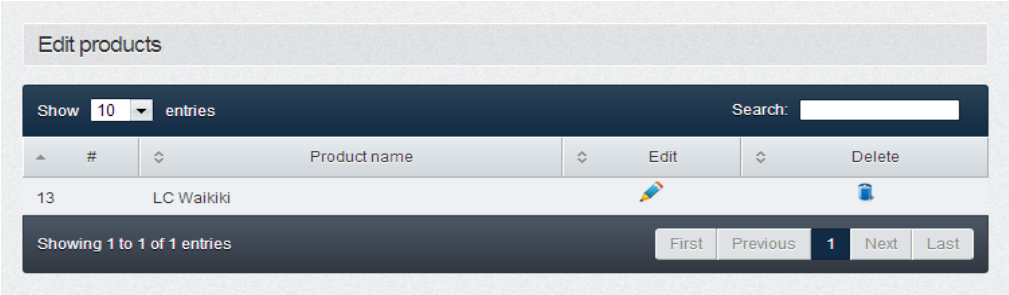


Figure 3.55: Product Selection for Editing

Company owner must click on the 'edit' icon to edit a product. Then, the page in figure 3.56 will be displayed.

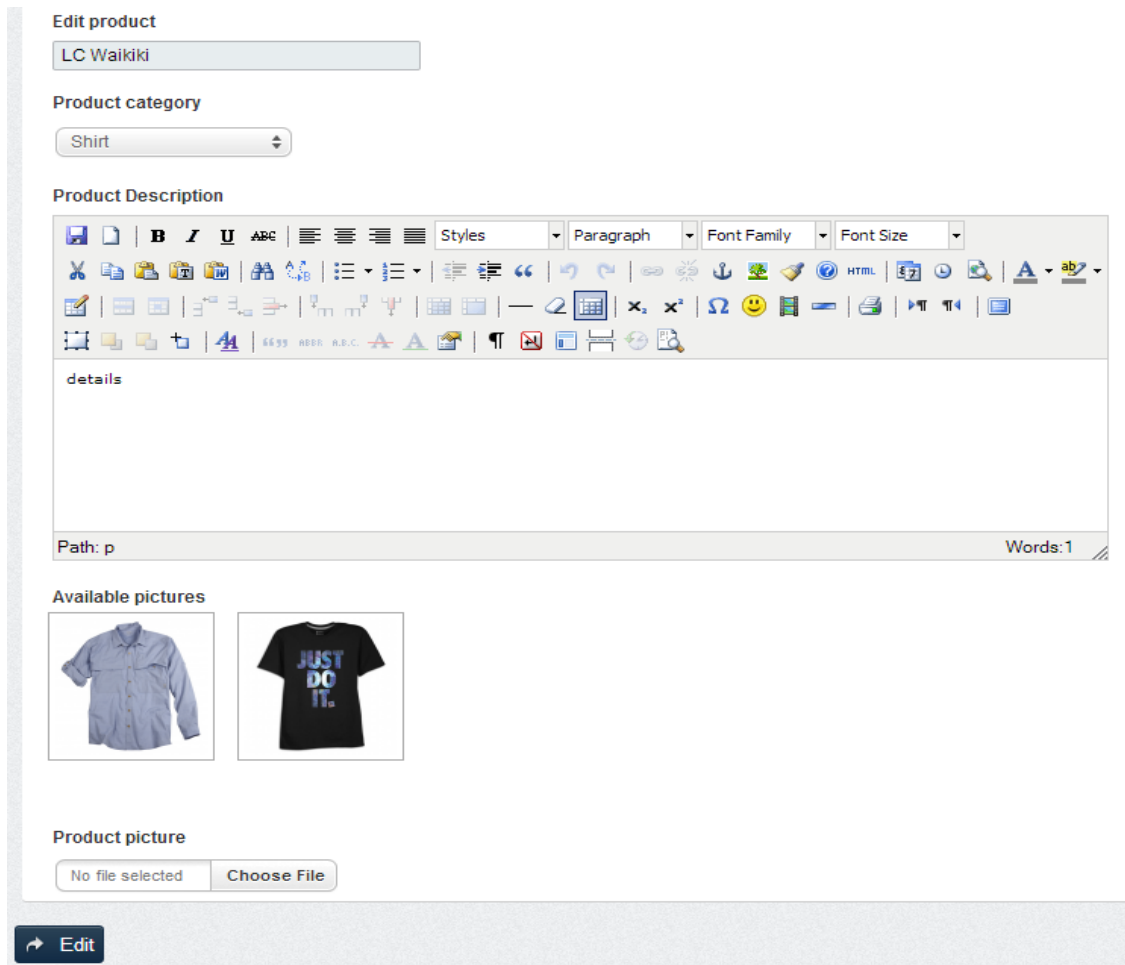


Figure 3.56: Editing Product Information

All fields can be updated by the company owner, then company owner must click on the 'Edit' to finish the update process. Then, the System will display a message in figure 3.57 to approve that product is updated. Also company owner can delete the product by clicking on 'delete' icon.



Figure 3.57: Product Updated Message



### 3.2.2.5 “Panorama” Menu Item

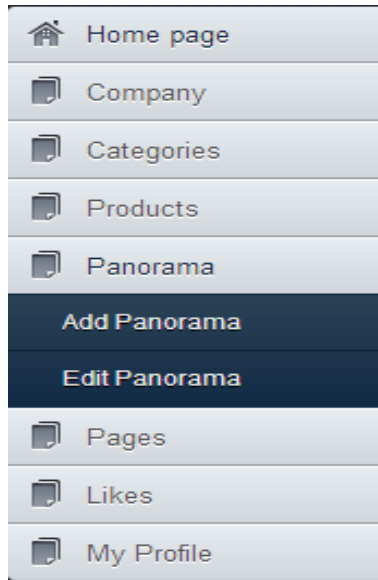


Figure 3.58: ‘Panorama’ Menu Items

The ‘Panorama’ is the fifth item of the menu as it is shown in figure 3.58. Company owner can add panoramic view to the company. After ‘panorama’ item is clicked ‘Add Panorama’ and ‘Edit Panorama’ icons will appear. When company owner clicks on the ‘Add Panorama’ icon, the system will display ‘Add panorama’ page in figure 3.59.

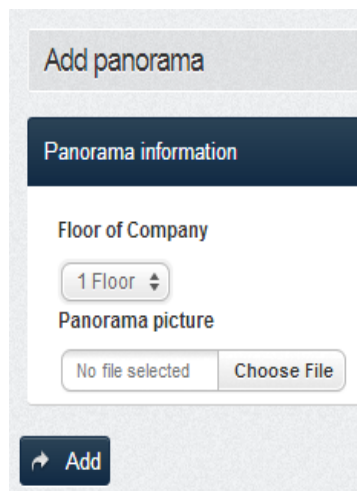


Figure 3.59: Adding Panorama

Company owner can select the floor that wants to add panorama to it. Then, image for panorama will be chosen from ‘Panorama picture’ icon. After information is entered, company owner will click on the ‘Add’ icon, then system will save information and display a message in figure 3.60 to indicate that panorama is added successfully.



Figure 3.60: Panorama Added Message

If admin does not choose an image, system will display alert message in figure 3.6.

To edit panorama information the company owner must click on the ‘Edit Panorama’ icon. Then the system will display the page in figure 3.61.

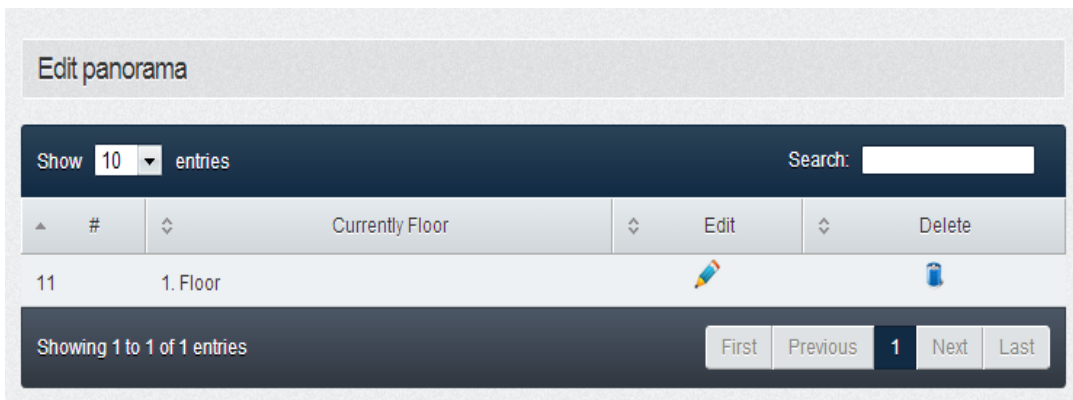


Figure 3.61: Panorama Selection for Editing

Note that, company owner can delete panorama by clicking on the ‘delete icon’. Company owner can edit panorama by clicking on the ‘Edit’ icon. After that, system will display ‘Edit panorama’ in page figure 3.62.

Edit panorama

Panorama information

Floor of Company

1 Floor

Panorama picture

No file selected Choose File

Edit

Figure 3.62: Editing Panorama

Company owner can update the panoramic image for each floor by clicking on the 'Choose File' icon from the 'Panorama Picture' field. After company owner clicks on the 'Edit' button, the system will save the entered information and will display message in figure 3.63 to indicate that panorama has updated successfully.



Figure 3.63: Panorama Edited Successfully Message

### 3.2.2.6 “Pages” Menu Item

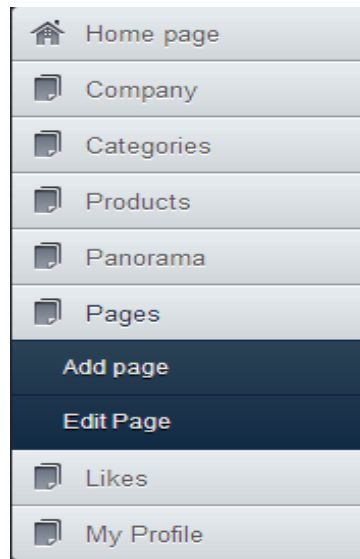


Figure 3.64: ‘Pages’ Menu Items

As it is seen in figure 3.64, the ‘Pages’ is the sixth item of the menu. Company owner can add submenu to the company’s main menu, edit submenu and delete submenu. When company’s owner clicks on the ‘Add page’, the page in figure 3.65 will be displayed.

Add New Page

Add New Page

Page Name

page description

**B** *I* U ABC | ↶ ↷ | 🎨 | ☰ ☱

➔ Add

Figure 3.65: Adding New Page

The company owner can enter the 'Page name' and 'page description' to create a submenu. Page name field is required to create a submenu. After filling the fields, the company owner must click on the 'Add' icon, after this, the system will save the entered information and add submenu item to the main menu. Finally, the message in figure 3.66 will appear to indicate that submenu is added successfully.



Figure 3.66: Page Added Message

If company owner does not fill the 'Page name' field, the message in figure 3.6 will be displayed. Company owner can edit submenu by selecting the submenu that wants to be edited and then must click on the 'edit' icon. Figure 3.67 will display the process.

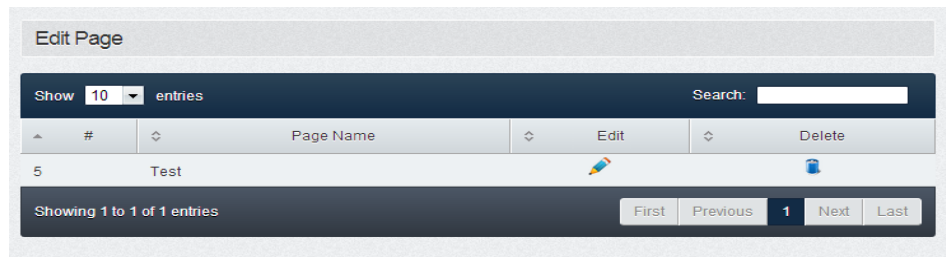


Figure 3.67: Selection of Page for Editing

After clicking on the 'edit' icon, Figure 3.65 will appear and company owner can edit the content of the submenu. Company owner must click on the 'edit' to finish the process. After that, then the message in figure 3.68 will appear to ensure that submenu is updated.



Figure 3.68: Page Updated Message

### 3.2.2.7 "Likes" Menu Item

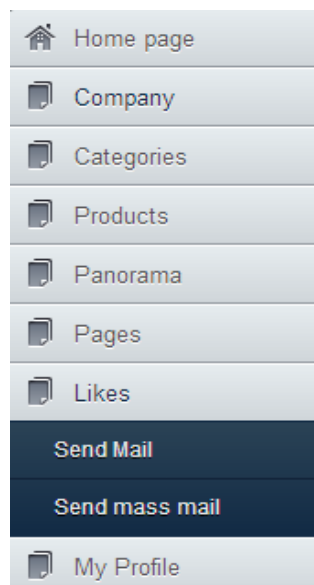


Figure 3.69: 'Likes' Menu Item

As it is displayed in figure 3.69, 'Likes' is the seventh item of the menu. Company owner can send e-mails to users who are interested in company. When company owner clicks on to 'Send E-mail' item, the system will display 'liked' page in figure 3.70.

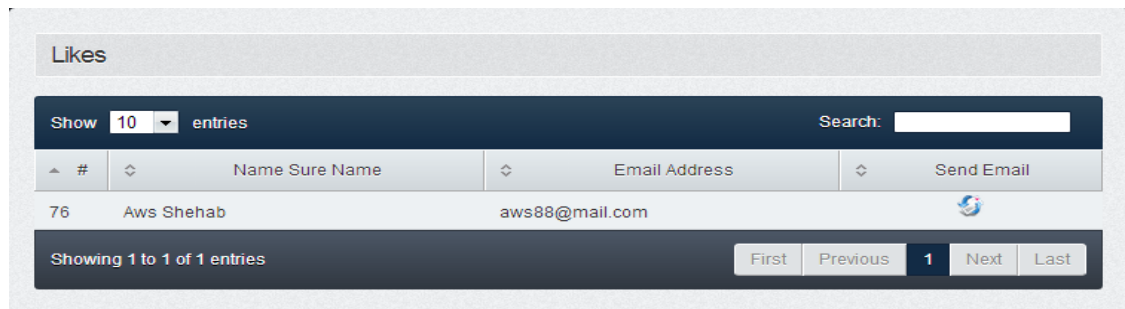


Figure 3.70: List of Users Interested in a Company

In order to send an e-mail to a specific user, admin must click on the 'E-mail' icon. Then, the system will display the page in figure 3.71.

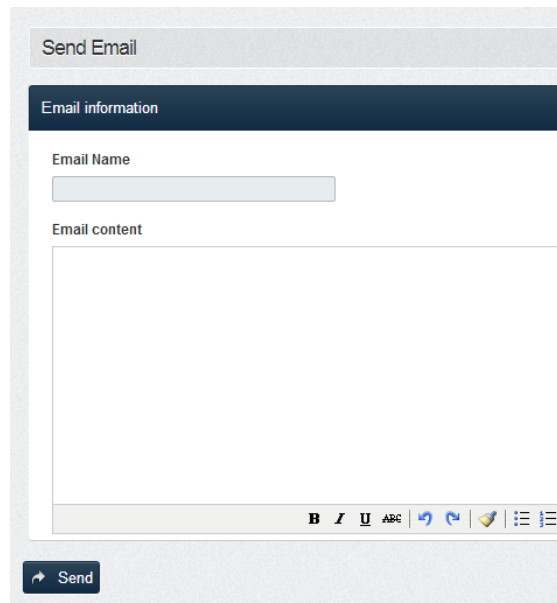


Figure 3.71: E-Mail Box

Company owner enters 'E-mail Name' and 'E-mail content' information and then press 'send' icon to send an e-mail to the user.

If company owner does not fill one of fields, the system will display an alert message in figure 3.72.

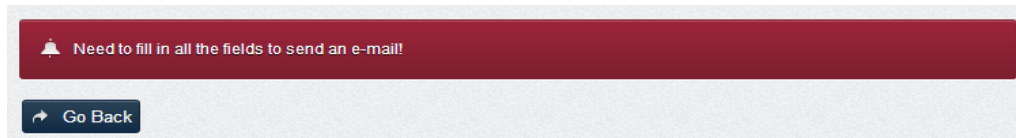


Figure 3.72: Fill the Fields Alert Message

If any error occurs during the sending process, the system will display an alert message in figure 3.73 to indicate that e-mail didn't sent.

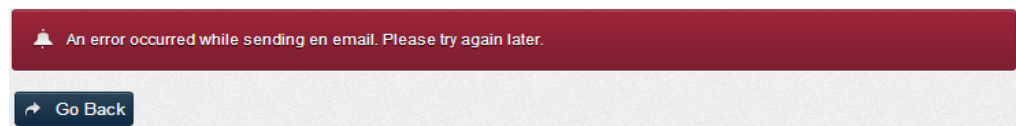


Figure3.73: Sending Error Message

If the company owner tries to send an e-mail to all users, then 'Mass E-mail' is used for that purpose with preceding procedure.



### 3.2.2.8 “My profile” Menu Item

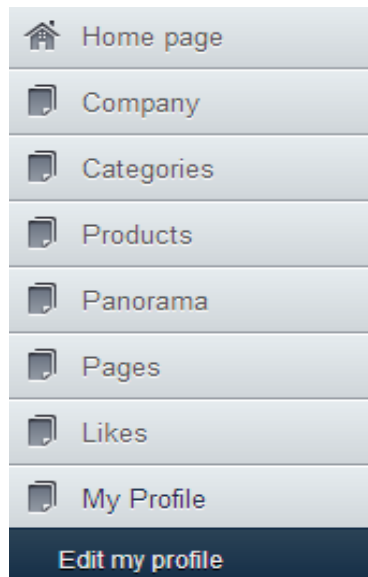


Figure 3.74: ‘My Profile’ Menu Item

As it is shown in figure 3.74, ‘My Profile’ is the last item of the menu. Company owner can update his/her own information by clicking on the ‘edit my profile’ icon. The system will display ‘profile’ page in figure 3.75.

**Edit my Information**

**User Information**

**Name**

**Sure name**

**Mobile Number**

**Address**

**E-Mail Address**

**Password**

**Edit**

Figure 3.75: Editing Company Owner Information

Company owner can update 'Name', 'Surname', 'Mobile Number', 'Address', 'E-mail address' and 'Password'. All fields except 'Address' filed are required for updating process. After entering all information, company owner must click on the 'Edit' icon to complete the process. Then, the system will display the message in figure 3.76 to indicate that information is updated successfully.

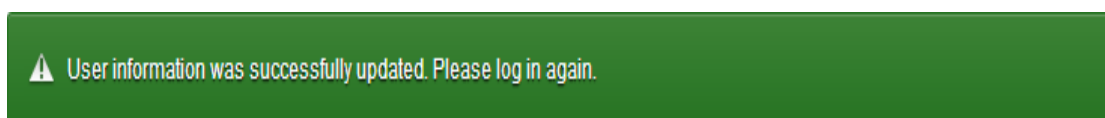


Figure 3.76: Information Updated Message

In a case that company owner does not fill one of the required fields, the system will display an alert message in figure 3.77 to indicate that one of the fields is empty.

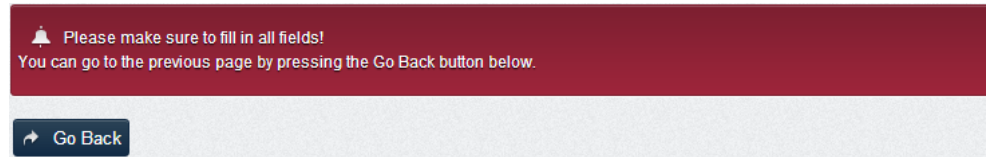


Figure 3.77: Fill in All Fields Message

### 3.2.3 User View

When a customer visit the Web site, the home page will be displayed to him/her. Figure 3.78 shows the home page.



Figure 3.78: Home Page Displayed for a Customer

User can navigate the buildings through both side of the street, can contact the admin of Web site and can also visit the company without being registered.

If a customer wants to register in the Web site, then he/she must click on the ‘register’ icon in the top of the menu. Then, the box in figure 3.79 will appear.

A screenshot of a 'New user registration' form. The form is titled 'New user registration' in blue text at the top left. It contains several input fields: 'Name' with the value 'user', 'Surname' with the value 'user', 'Sex' with a dropdown menu set to 'Male', 'Birthday' with three dropdown menus set to '1', '1', and '1980', 'E-mail' with the value 'usertest@mail.com' and a green checkmark to its right, and 'Password' with the value 'password'. A 'Submit' button is located at the bottom left of the form. A small 'x' icon is visible in the top right corner of the form's border.

Figure3.79: Registration Box

In order to register in the Web site, ‘Name’, ‘Surname’, ‘Sex’, ‘Birthday’, ‘E-mail’ and ‘Password’ must be entered by the customer. Note that, the system will check the entered e-mail, if the e-mail is already in the system then the customer will be notified by ‘red x’ otherwise the system displays ‘green tick’ to indicate that the entered e-mail is accepted by the system.

Customer must click on the ‘Submit’ icon and the message in figure 3.80 will appear.

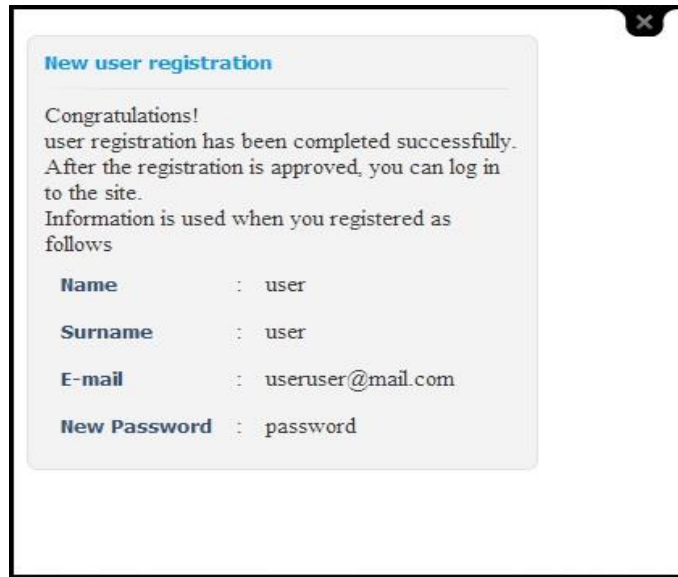


Figure 3.80: Registration Information

The system notifies the customer that after registration is approved by the admin he/she can login to the system. Customer can login to the Web site by clicking on the 'login' icon, then, login box in figure 3.81 will appear. In order to login, user must enter his/her 'E-mail' that he/she has registered with and then enter the 'Password'.



Figure 3.81: Login Box

The customer can edit his/her information by clicking on the 'Profile' icon in the top of the main menu. Figure 3.82 will explain the process.

The image shows a web-based 'Edit Profile' form. At the top left, the title 'Edit Profile' is displayed in blue. Below the title, there are four input fields, each preceded by a colon and a label: 'Name' with the value 'Aws', 'Surname' with 'Shehab', 'E-mail' with 'aws\_nabeel@yahoo.com', and 'New Password' which is currently empty. A 'Submit' button is located at the bottom of the form. A small black 'X' icon is visible in the top right corner of the form's container.

Figure 3.82: Profile Box

Customer can update all his/her information and then click on the 'Submit' icon to save the edited information to the system.

When a customer clicks on a company logo inside of any building in the street, company page will appear as it is seen in figure 3.83.

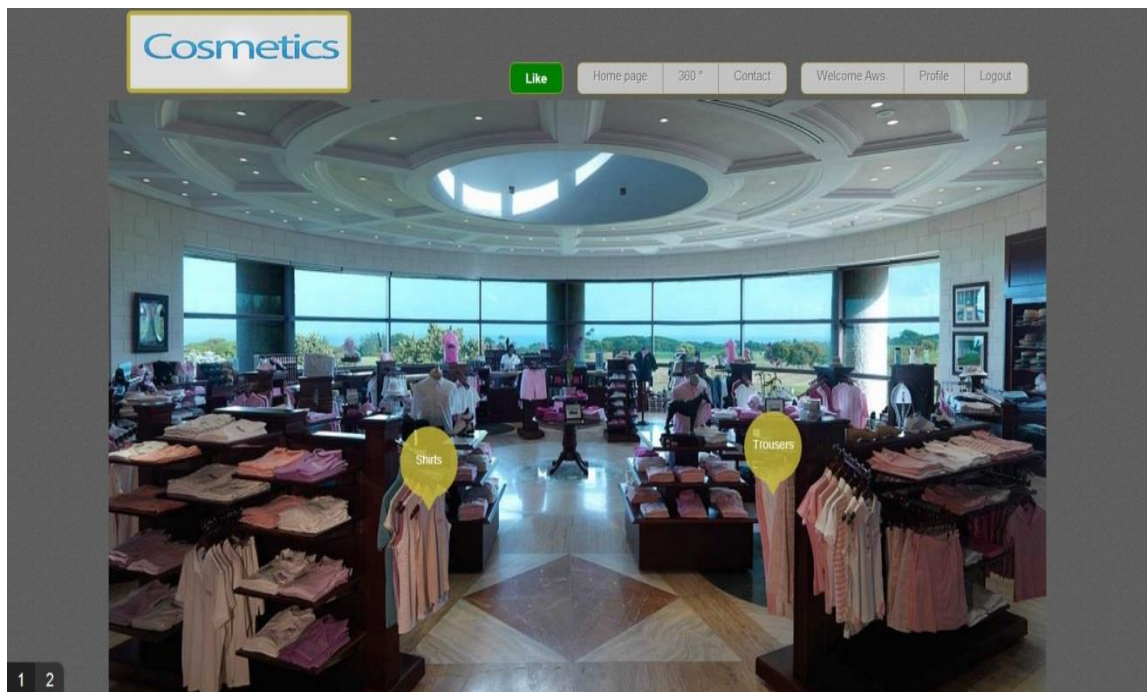


Figure 3.83: Company from Inside

A customer can view all of the floors of a company and in a case that company consists of multiple floors; customer can select the floor number in the bottom of the page. When a customer clicks on the category region, the products in that region will be displayed. Figure 3.84 will show the process.

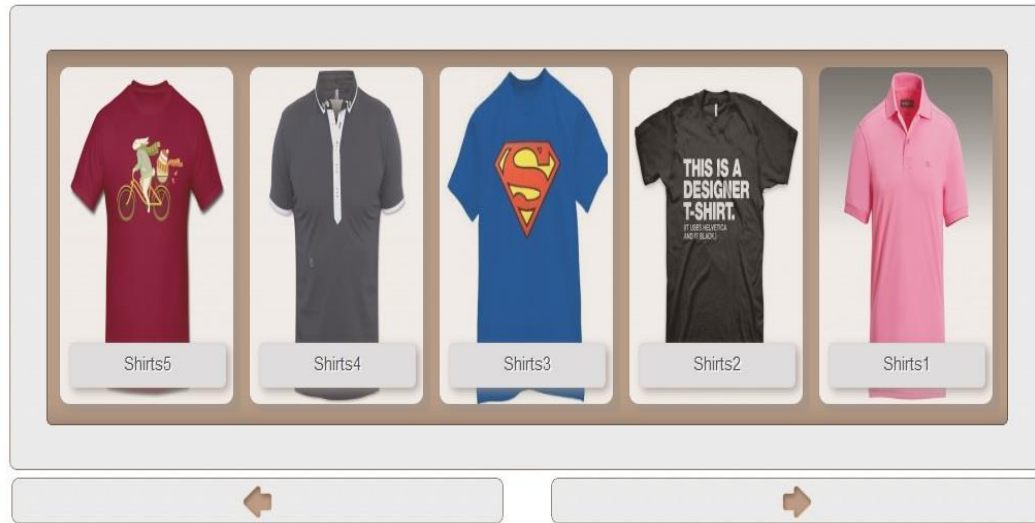


Figure 3.84: Products in a Specific Region

When a customer clicks on any product, figure 3.85 will be displayed.

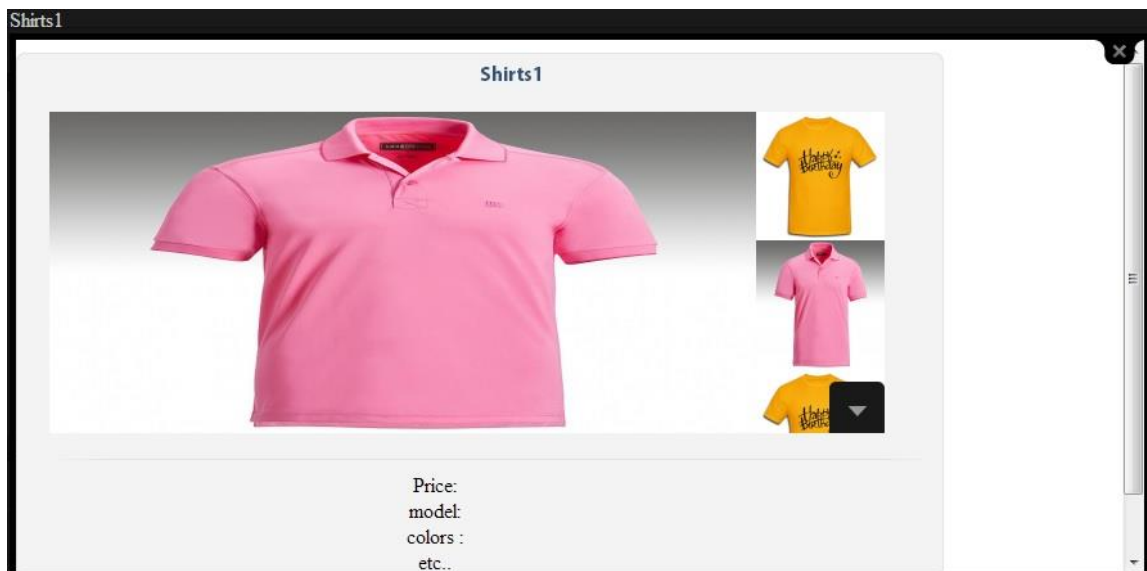


Figure 3.85: Product with Multipicture and Description



Customer can navigate products with multiple pictures at the right side of the product box, also can check the product description in the bottom of the box.

When customer clicks on the '360' the panoramic view will appear, then, customer can navigate the company from right to the left as seen in figure 3.86.



Figure 3.86: Panoramic View of a Company

A customer can also contact the company owner by clicking on the 'Contact' icon on the top of the main menu. Figure 3.87 will explain the process.





The image shows a contact form titled "Contact" with the following fields and values:

<b>Name</b>	: Aws	<b>E-Mail</b>	: aws.an.nabeel@gmail.com
<b>Surname</b>	: Shehab	<b>Address</b>	: Famagusta -dau 2
<b>E-mail</b>	: aws_nabeel@yahoo.com	<b>Phone</b>	: 0533886080
<b>Subject</b>	: Test		
<b>Messages</b>	: send email		

At the bottom of the form is a "Submit" button.

Figure 3.87: Contact Form

The customer must fill all the fields and then click on the 'Submit' button to send the e-mail to the company owner. The message in figure 3.88 will appear.

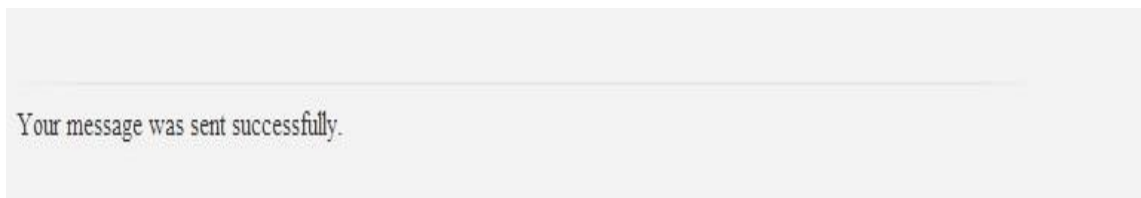


Figure 3.88: Message was Sent Successfully

Finally customer can also receive e-mails about the company he/she is interested in from company owner by clicking on 'Like' icon on the top of the main menu. In a case that he/she does not want to receive any e-mails, he/she can click 'Unlike' icon to stop receiving e-mails.

## CHAPTER 4

### COMPARISON WITH RELATED WORKS

When our system is considered, there are no other systems that are encountered. But, there are systems which carry the same idea of advertising. Some of these systems are discussed below.

First one is “Kırını Piliçleri” [18]; this system advertises the chicken products of “Kırını Piliçleri” company, as shown in figure 4.1.

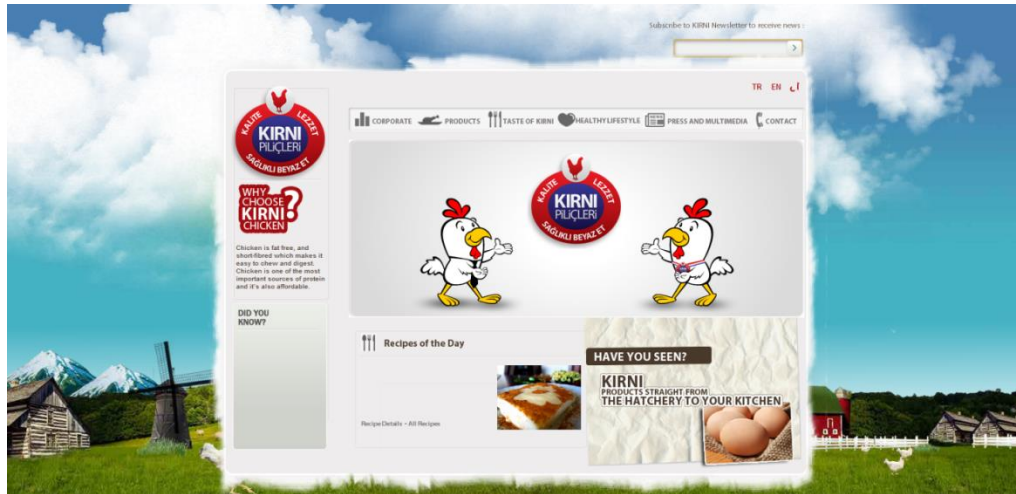


Figure 4.1: “Kırını Piliçleri” Home Page

As it is seen in the homepage, the application is designed to advertise the specific products for specific company. The advertisements are delivered only by a picture and

text. The communications inside the system are done only by written emails and mobile numbers.

The second one is “Knorr” [19], this application is developed to advertise and to market the Knorr company products as shown in figure 4.2.



Figure 4.2: “Knorr” Home Page

Just like the Kırmı Piliçleri application, “Knorr” application is developed for the specific company in order to advertise the specific products. This application is designed with “flash script” which this may cause several problems while operating on iOS devices.

The third application called “Oxford Street London” [20], advertises companies or business that are located in the Oxford Street in London, as it is displayed in figure 4.3.

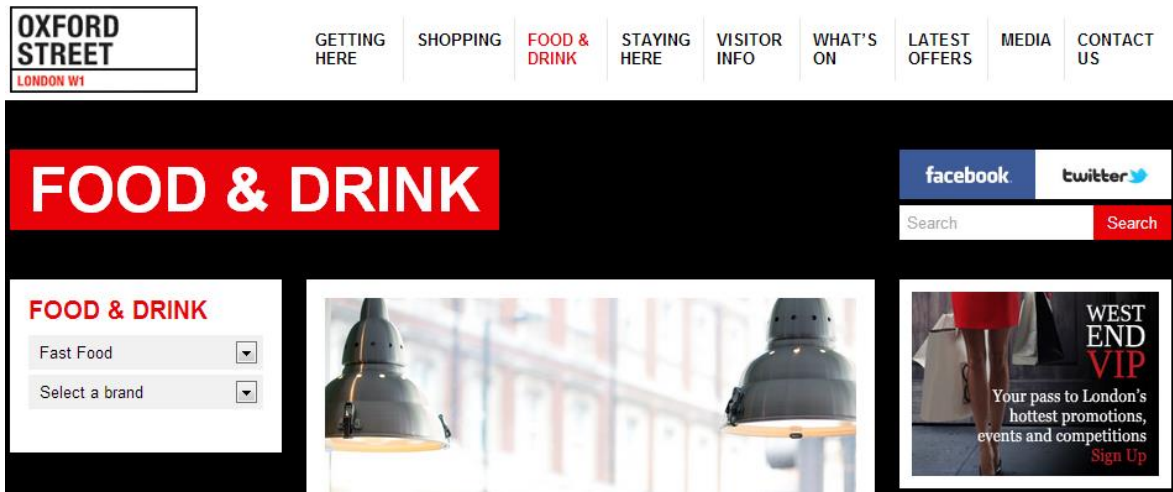
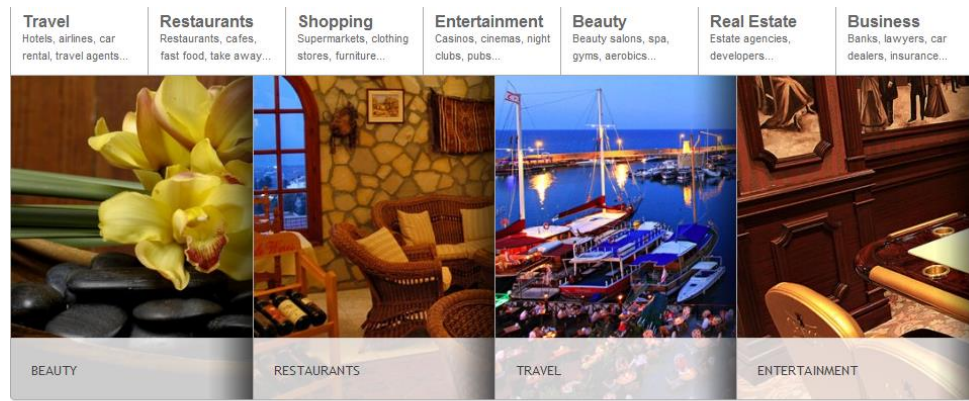


Figure 4.3: “OXFORD STREET” Home Page

The application divides the companies into categories. After categories are selected, the user can choose the company that he/she wants to view. This application can display a static text with the company’s Web site if it is available.

The “North Cyprus Blog and Reviews” [21] is the last application and it is designed to exhibit companies and business in the Northern Cyprus as it is shown in figure 4.4. The application shows the companies and the business in categories and shows their rates according to their quality of service, location and some other measurements.



Did you love it? Or do you just hate it? So **rate it!**

North Cyprus Blog and Reviews is a free service about sharing your experiences. Sounds like fun? You can **rate places or services online, post a comment, write a complaint, or praise to the skies.**

**Share your opinions** on that developer who actually got the job done to the lawyer who didn't.

Sick of the bank manager or loved the fantastic new restaurant! **Let everybody know.**

Rate your entire North Cyprus holiday or recommend a hotel.

Even rate about your favourite hair dresser or trash that expensive boutique shop.

**North Cyprus Blog and Reviews** website is also here to help you find it, yes, the right place to spend your hard earned pounds. Find clubs and pubs, the best restaurants, coffee shops or spa salons in North

#### Categories

- ▶ Airlines
- ▶ Banks
- ▶ Car dealers
- ▶ Car rental
- ▶ Casinos
- ▶ Cinemas
- ▶ Clothing shops
- ▶ Coffee Shops
- ▶ Estate Agencies

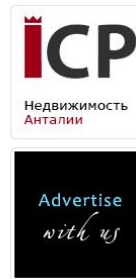


Figure 4.4: “North Cyprus Blog and Reviews” Home Page

As we compare our application with the mentioned applications above, first of all, the dynamicity of the application that allows the admin to create environment (buildings and company) in a way that looks similar to the real buildings and companies in any street, unlike the others. The visual representation allows the customers to easily find the company visually, instead of searching in the menus as it is shown in the other applications. The interactivity of our application is to allow companies to advertise their goods and products in an interactive way that allow the customer to view them with comfortable way, like the “Kırmı Piliçleri” and “Knorr” application. Finally, our application is contributed for economic growth for all companies in the street, unlike the “Kırmı Piliçleri” and “Knorr” which they only contribute in the company economy.

## Chapter 5

### CONCLUSION

There are many difficulties to increase companies' sales in Turkish Republic of Northern Cyprus. One of these difficulties is the lack of communication between the customers and the companies. Our interactive Web application is developed to reduce these difficulties in communication, be a bridge between the companies and the customers and also to contribute in TRNC's economic growth with the following benefits:

- The dynamicity of the system makes it easy to be applied for any street in TRNC (or any other country).
- Customers will make a benefit of interactive interface in finding their needs without physically visiting the companies as well as in more comfortable way.
- Customers can easily get the details of each product.
- Company owner can communicate with the customers who are interested in the company.
- The companies can take an advantage of the system to attract more customers.
- Companies can deliver its advertisements, promotions, latest activities to the customers via our system in an easier and cheaper way.
- The system has mobile user friendly interface.

- The work force that required for running the system will be minimized.
- It can be comfortable for disabled persons as well.

Finally, our system is a prototype and, therefore, applicable for using in other cities in TRNC and in other cities in other countries.

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