

**Palestine Polytechnic University**  
**College of Administrative Science and Informatics**  
**Department of Information Technology**



**Content Adaptation for Mobile Devices**  
**(University Announcement System)**

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## **Abstract**

The idea of this project is to build a web and (Short Message Service) SMS based announcement system for Palestine Polytechnic University (PPU). The system aims to enable PPU staff members and students to access university announcements through their Personal Computers (PCs) and mobile phones.

The main task is not to fill the application with information but to make the information accessible with a large number of mobile devices where the application actually makes use of the device capabilities. For example, a mobile phone that only supports black and white images will display only pure text content, more capable phones will display simple images that have limited number of colors (white and black only), while a more capable phone will receive content with different multimedia elements .

The system provides two basic functions the former is to provide a web interface through which users can access PPU announcements through their personal computers and/or handheld devices such as mobile phones and Personal Digital Assistances (PDAs). The latter is to provide an SMS announcement service; this service is used to post new announcements to registered user as SMS messages.

## ملخص المشروع

تقوم فكرة هذا المشروع على بناء نظام اعلانات الكتروني لجامعة بوليتكنيك فلسطين باستخدام تكنولوجيا الويب .  
والرسائل النصية القصيرة (SMS) .  
ويمكن النظام موظفي وطلاب الجامعة من الوصول الى اعلانات الجامعة من أي مكان من خلال أجهزة الحواسيب والهواتف النقالة الخاصة بهم.  
يهدف النظام بشكل رئيسي الى تمكين شريحة واسعة من أجهزة الهواتف النقالة للوصول للنظام والحصول على محتوى مناسب لامكانيات كل جهاز, فالأجهزة ذات المواصفات والأمكانيات البسيطة مثلاً ستحصل على الأعلانات بشكل نص, بينما ستحصل الأجهزة ذات المواصفات الأعلى على صور غير ملونة , والأجهزة الحديثة لعالية ستتمكن من عرض صور ملونة ووسائط متعددة (فيديو, صوت.....) بما يتناسب مع أنواع الملفات التي تدعمها.

## ***Dedication***

*To those who have sacrificed much to provide us with the quality of life from which we could choose what we want to be.....to our dear mothers*

*To those who never once allowed us to believe that it couldn't be done..... to our dear fathers.....*

*To those who granted us the tenderness and taught us the patience.....to our dear supervisor Hani Salah.....*

*To those who have contributed in the knowledge and science process .....to all those who believe in the richness of learning.....to our dear instructors.....*

*To those who granted us respect, love, honest.....to our friends*

*To our eyes sisters and brothers...*

*To the flower who gave us the ability to continue*

*To all of those persons who help us to deliver this project in time...*



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*The project team granted special thanks to their dear supervisors Hani Salah who have granted us support.....*

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## 1.1 Initiation

As a result of modern technological development in the area of mobile services, and the emergence of Wireless Access Protocol (WAP) to provide internet services for mobile phones, where this protocol enable to operate computer characteristic on a mobile phone taking into account physical and technological characteristic that differentiated between mobile phone and personal computer, such as the small size of mobile screen, memory storage in phone and other feature, that will be discussed later.

The system will take into account the different types of mobile phones and the publication period that includes the old dealing with text and some black and white images and the recent types that receive colored images, voice, video and other multimedia elements.

## 1.2 System Definition

The system is built to overcome the problem that faced by many users when they use their mobile phones. In this project, we implement announcement system that solve the problem of student that faced by them when they get university Announcement.

And this system doesn't require any desktop computer that need internet connection, there is a problem here that many students don't have computer and internet, and this system come to take advantage from WAP services that available for mobile phone to enable students to see a different announcement. Where there must be fitting between the content of announcement and mobile phone characteristic that will receive this announcement.

## 1.3 System Benefits

- This system is a mean to decrease the student's effort and to help them for getting information.
- Enabling the students to stay in contact with their university.



- It enables students to see and get the university announcement and information at any time and place.
- The system is accessible through various client devices such as PCs, and wide range mobile devices.

### 1.4 System Constraints

There are some constraints that appear for team project during system development:

- The small size of the mobile phone screen and the low resolution.
- The small size of memory storage of mobile phones.
- There are some students with no mobile phones, and some with mobile phones that don't supports access to the internet.
- There are some areas that are not covered with mobile services.
- The time is limited by the end of the course's there was not enough time to finish the project at the requested time.

### 1.5 Wireless Application Protocol ( WAP)

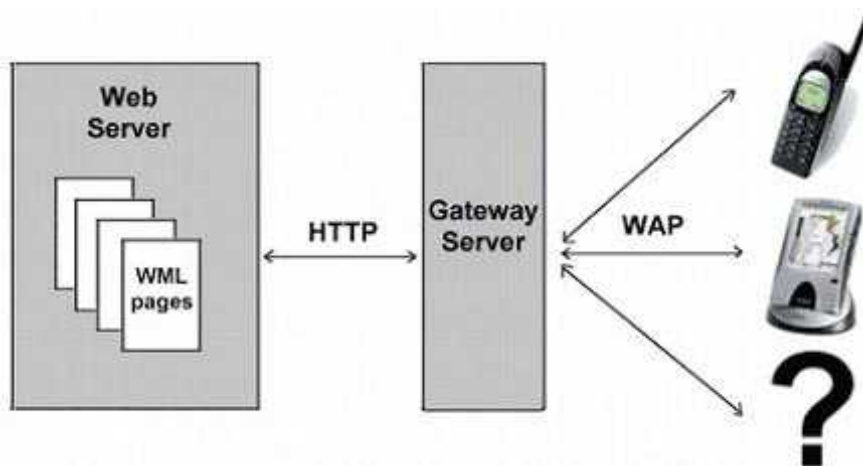


Figure (1.1): WAP System Architecture



WAP is a protocol that using to present web content in mobile devices for different mobile types and it is based on a set of standards (xml, html, TCP/IP), and it is important .

In the area of the network in the process of exchange information between devices using wireless and to provide mobile phone for internet services and applications.

### 1.6 Mobile Generations and Connectivity

WAP can be used to support a variety of multimedia technologies that belong to different mobile generations.

Table1 summarizes and compares among mobile generations and the technologies that used in each generation:

Table (1.1): Mobile Generations

	<b>1G</b>	<b>2G</b>	<b>2.5G</b>	<b>3G</b>
<b>Technology</b>	AMPS,FDMA,TACS	GSM,CDMA,TDMA	GPRS,HSCSD,EDGE	W-CDMA(UMTS)
<b>Radio Signals</b>	Analog	Digital	Digital	Digital
<b>Bandwidth</b>	Low	low	Medium	high
<b>Support MM</b>	NO	YES	YES	YES



## 2.1 Initiation

This chapter presents the specifications of the system requirements, as a result of system analysis.

This chapter will include the following:

- System objectives.
- Research problem.
- Solution proposed to solve research problem.
- Functional requirements.
- Requirement specifications.
- Non-Functional requirements.
- Constraints.
- Feasibility study.

## 2.2 System Objectives :

This system aims to achieve the following objectives:

- To save time and efforts for both teachers and students; so they can deal with university announcements quickly.
- To enable PPU staff members and students to browse the university announcement any where and any time using their PCs and/or mobile phones.
- University announcement sent to PPU staff members and students according to the type of mobile and its support for multimedia.



### 2.3 Research Problem

The research team identified the problem that faced by the students when they get the university announcement and we can summarize this problem in the following points:

- Many students are grouping in front of announcement board and this doesn't allow all students to read daily announcements.
- Internet is not available for all of the students; therefore don't enable them to see the announcement on university website.
- The research problem is presented in student suffering especially in these difficulty circumstances that prevent them to access to their university because of the occupation barriers.
- There are some announcements appear during university holiday and this prevent students to see them because they don't have geographical contact to there university or because they don't have internet at home, therefore getting announcements to their mobile phone is the best solution.
- There are some students having a sub sequential lecture and they don't have enough time to see the announcements in between their lectures.
- Having multiple separated campuses, some students from Abu-roman may have lectures in wadi-alharyah, so with mobile phone announcements he will be in contact with any new events in his college.

### 2.4 Solution Proposed To Solve Research Problem

As the results of studying research problem, the project team finds that the best optimal solution for this problem is to build announcement system, and this system offers many advantages:

- Save time and efforts.
- Available to student in any time and place.
- Ease and quick access announcements.
- Decrease grouping of student in front of announcement board.



## 2.5 Functional Requirements :

This system includes a set of functional requirements:

- Provides users with authenticated tools and facilities.
- Collect the needed information for users.
- Providing phone user with the ability to send SMS to request Announcement University.
- Enable the system to receive SMS from users at their request and send them to service whether SMS or MMS.
- Provide managerial tools for the system administrators.
- Enable the user to review announcements from university through the web site, according to divisions the university and the type of announcement.

## 2.6 Requirements Specifications:

This clause contains the specification of the functional requirements of the system:

### 1. Provides users with authenticated tools and facilities:

- User registration.
- User log in.
- User log out.
- User forgotten password.

### 2. Collect the needed information for users:

- User change password.
- User edits profiles.
- User view data

### 3. Provide managerial tools for the system administrator:

- Change user password.
- View users.
- Send announcement.
- Administrator log in.
- Administrator log out.
- View administrator data.
- Edit administrator profile.





- Change administrator password.
- Add announcement
- Delete announcement.
- Add user.
- Delete user.

## 2.7 Non-Functional Requirements :

The following characteristics should be available in the system.

### 1. Compatibility:

- The system should provide the service to the largest number of type of mobile available in the market.
- The system must support the service to send the largest numbers of user phone available in the DB.

### 2. Security:

- User side security in web site: include secure and authentication log in.
- Server side security: include secure and authentication log in for administrator only.
- Not to permit access to the data base and manipulated by any user.

### 3. Speed:

High response to the user request.

### 4. Accessibility:

That the system is easy to use and easy updating by the system administrator, and the serial interfaces to interact with the system.



## 2.8 Economic Feasibility:

In this section we will discuss the feasibility of the system.

### 2.8.1 Development Cost:

The following table lists the cost of the hardware we need to develop the system.

Table (2.1): Hardware Development Cost

Item	Number of units	Unit cost	Total cost
PC p4, 3 GB RAM, HD 320 GB, 2 GHz CPU with 2.78 GHz speed.	2	599 \$	1198\$
Connection cable USB port	1	8.50\$	8.50\$
Flash memory 2GB	3	11.99\$	35.97\$
HP officejet 6500 wireless all- in- one inkjet printer	1	159\$	159\$
Nokia Mobile6100	1	130\$	130\$
Nokia mobile	1	50\$	50\$



The following table lists the software cost needed to develop our project

Table (2.2): Software Development Cost

<b>Item</b>	<b>Number of units</b>	<b>Unit cost</b>	<b>Total cost</b>
Microsoft windows XP	2	187.99\$	375.98\$
Visual studio.net 2005	1	199.99\$	199.99\$
Microsoft office 2003	1	399\$	399\$
SQL Server 2000	1	149.94\$	149.94\$
Nokia PC suite for Nokia 6100	1	free	free
HyperTerminal	1	10\$	10\$
Photoshop	1	145\$	145\$
Microsoft Visio professional 2007	1	399.99\$	399.99\$
Flash MX professional 2004	1	349.50\$	349.50\$



The following table lists the human resources needed to develop our system and their costs:

Table (2.3): Human Development Cost

Persons	Person no	Cost/month
Programmer.	2	400\$
Web Designer.	2	350\$
Data base developer and documentation.	2	500\$

The total cost needed for the development of our project:

Table (2.4): Total Development cost

	Total
HW cost	1581.47\$
SW cost	2029.4\$
Human cost	1250\$*12month=15000\$
Total	18610.47\$

### 2.8.2 Operation Cost:

The following table includes the hardware we need to operate the system.

Table (2.5): Hardware Operation Cost

Item	Number of units	Unit cost	Total cost
PC p4, 3 GB RAM, HD 320 GB, 2 GHz CPU with 2.78 GHz speed.	1	599 \$	599\$
Connection cable USB port	1	8.50\$	8.50\$
Nokia Mobile6100	1	130\$	130\$
Nokia mobile	1	50\$	50\$



The following table represents the software operation costs for our project

Table (2.6): Software Operation Cost

Item	Number of units	Unit cost	Total cost
Microsoft windows XP	1	187.99\$	187.99\$
Visual studio.net 2005	1	199.99\$	199.99\$
SQL Server 2000	1	149.94\$	149.94\$
Nokia PC suite for Nokia 6100	1	free	free

**Human Operation Costs:**

Table (2.7): Human Operation Cost

Persons	Person no	Cost/month
Administrator.	1	500\$
Assistance.	1	400\$

**Total cost:**

Table (2.8): Total Operation Cost

	Total
HW cost	787.5
SW cost	537.92\$
Human cost	900\$*12month=10800\$
Total	12125.42\$



## 2.9 Time Scheduling:

The following table shows the tasks we perform and the weeks we assign for them, also we perform some tasks in parallel with other task ,that's will appear obviously in the Gantt Chart.

Table (2.9): Time Scheduling

Task	Work	Time in weeks
T1	Information gathering and system specification.	2
T2	Software planning.	2
T3	Software requirements specification.	3
T4	System design.	3
T5	Coding and implementation.	4
T6	System testing.	2
T7	System maintenance.	3
T8	Documentation.	15



### 2.9.1 Gantt Chart for Time Scheduling:

The following table shows the Gantt chart for time scheduling among each task.

Table (2.10): Gantt Chart

week \ Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
T1	█	█													
T2			█	█											
T3					█	█	█								
T4								█	█	█					
T5										█	█	█	█		
T6													█	█	
T7														█	█
T8	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█



### **3.1 Initiation:**

In this chapter we discuss the functional details description and details for each validation and constraints.

Also this chapter includes:

- Requirements functional details description.
- Functional details specifications.
- Context diagram.
- Deployment diagram
- Data flow diagram.
- Database dictionary.
- Data dictionary.

### **3.2 Description of Functional Requirements :**

In this part, we describe the system functions.

#### **1. Provides users with authenticated tools and facilities:**

- User registration : each user in system is able to register in web site to enable him to view the announcements of university , the user insert his name ,password , number of his phone this field enable administrator to send anew announcement to user after identifying the specification of his device.
- User log in: this function enables the user to log in to the web site.
- User log out: this function enables user to end their session.
- User forgotten password: this function enable user to remember his/her password by insert user id and request his secret question from database and the user insert the answer question if true return the password for the user.





## **2. Collect the needed information from users :**

- User change password : this function enable user to change his password only when he log in the web site , this is done by insert user id and new password then click change .
- User edits profiles: this function enable user to change his data that is stored in database.
- User view data: this function enables user to see his data stored in database when registered in the server.

## **3. User can send SMS to the website to request announcements**

This function enable user to connect with the server by sending text message to request announcements stored in the server ; such as user send text message include **AT** this mean request announcement type text ,also when user sends this SMS his number stores in the data base.

## **4. Enable the system to receive text message from users at their request and store them at the server whether SMS or MMS**

This function enable system to receive text message from user at their request, and then enable administrator to respond to the request, and then reply by send announcements based on the user message. If user send message include **AT** the server reply by sending text announcement else if message includes **AM** the server reply by sending multimedia announcement.

## **5. Provide managerial tools for the system administrators:**

- Change user password: this function enable administrator to change the user password, this is done by insert user id and new password then click change.



- View users: this function enable administrator to view the users, which is stored in the database.
- Send announcement: this function enable administrator to send the announcement from server to user phone number that stored in the database.
- Administrator log in: this function is the only method for administrator to lo in to server, log in using administrator id and password.
- Administrator log out: this is function to end administrator session.
- View administrator data: this function enable administrator to show his data stored in database.
- Edit administrator profile: this function enable administrator to change his data that stored in database.
- Change administrator password: this function enable administrator to change his password.
- Add announcement: this function enable administrator to add new announcement to database , this done by insert announcement id ,subject, create date , number of day , and selected the type of announcement ; if type selected is text the administrator  
Insert the text of announcement, else if type selected is multimedia then the administrator insert the path of announcement, final click add button to store this announcement in the database.
- Delete announcement: this function enable administrator to delete announcement stored in database, this done by inserts announcement no then click delete.

## **6. Enable the user to see announcements from different sources, academic or nonacademic.**

This function enable users to see the announcements based on its source if it's from college, dept, or non academic units in the university, this function provides classifications and so, see the announcement in more efficient way, and quickly.



### 3.3 Specifications of Functional Requirements:

#### 3.3.1 User Functions :

- Log in as user :

Table (3.1): User Login

Function	User log in
Description	Authenticate the user by using valid user name and password
Inputs	Username , password
Outputs	User page
Source	Log in page
Requires	Valid log in
Pre-condition	User registration
Post-condition	the user page display
Procedure	User enters the user name and password is compared with data stored in the database, if the data entered is correct move the user to user main page.



- User Log out :

Table (3.2): User Logout

Function	User log out
Description	This function allow the user to log out from his form
Inputs	Selecting log out link
Outputs	Log in form
Source	Click log out link
Requires	Nothing
Pre-condition	Login and be the user is in his session
Post-condition	Return to log in page
Procedure	When a user decides to leave his session by clicking on log out link, he will be redirected



- User Forgotten Password :

Table (3.3): User Forgotten Password

Function	User forgot password.
Description	This function enable user to remember his password.
Inputs	User name and secret question.
Outputs	Forgotten password.
Source	User lost password form.
Requires	Log in page.
Pre-condition	User should have a valid account.
Post-condition	Log in page.
Procedure	This function will return the password for user who forgot his password. This doing after the user enter log in user name and the system request the secret question. If secret answer and user name are valid returns password.



- User Change Password :

Table (3.4): User Change Password

Function	User changes his password.
Description	This function allows the user to change his password.
Inputs	User log in name and new password and click change button.
Outputs	New password saved in database.
Source	User session and change user password.
Requires	User log in.
Pre-condition	Old password
Post-condition	New password
Procedure	The user asked to input his log in name and new password. If user name entered correct return message your password changed.



- User Edits his Profile :

Table (3.5): User Edits Profile

<b>Function</b>	Edit user his data
<b>Description</b>	In this function the user can change his data stored in database only when he log in.
<b>Inputs</b>	Inputs new user data
<b>Outputs</b>	New user data stored in database.
<b>Source</b>	User and edits user profile form.
<b>Requires</b>	User registers and log in to account.
<b>Pre-condition</b>	Old user data.
<b>Post-condition</b>	New user data.
<b>Procedure</b>	User input new data want to change and stored in database.



- User View Data :

Table (3.6): User View Data

Function	View user data
Description	This function enables the user to view his information, which recorded by him when registered
Inputs	Click view data link
Outputs	View user data page
Source	User page
Requires	User registration
Pre-condition	User log in
Post-condition	View user data
Procedure	The user select (view user) data link, then the system request to data base and review the information to the user





- User Send Text Message to Request Announcements :

Table (3.7): User Send Text Message to Request Announcements:

Function	User request announcements
Description	This function enables the user to request the university announcement ,through sent a text message containing the type of announcement that want to see from his mobile
Inputs	Text message
Outputs	Message sent
Source	User and SMS
Requires	Mobile number
Pre-condition	Nothing
Post-condition	The message sent
Procedure	The user writes a letter containing the code known to the system requesting the service to the University Announcements



- User Review Announcement through Website :

Table (3.8): User Review Announcement

Function	View user announcement
Description	This function enables the user to view university announcement
Inputs	Select view announcement link and select source name , and type of announcement want to see
Outputs	Announcement page
Source	User and user web form
Requires	User log in
Pre-condition	User log in
Post-condition	View the user university announcement
Procedure	The user after log in the system and enter the user page can select any announcements want to see



### 3.3.2 Administrators Function Specification :

- Change User Password :

Table (3.9): Change User Password

Function	Change user password
Description	This function enables the administrator to change user password only when he login in the system
Inputs	User id , new password
Outputs	The password has been changed
Source	Administrator session , change user password link
Requires	Administrator log in
Pre-condition	Old password
Post-condition	New password
Procedure	The administrator inputs use login id and new password then click change button



▪ View Users :

Table (3.10): View Users

Function	View administrator users
Description	This function allows the user to view users which registered in the system
Inputs	Select view user link
Outputs	Viewing user page
Source	Administrator page
Requires	Administrator log in
Pre-condition	User registration
Post-condition	View users who registered
Procedure	The administrator selects view user link then the system requests it to the database and give the users



- Send Announcements to Users:

Table (3.11): Sends Announcement to Users

Function	Administrator send announcement to users
Description	This function allow administrator to send announcements to user phone that registered in the data base
Inputs	User phone number and announcement want to send
Outputs	Message : Announcement has been sent successfully
Source	Administrator page
Requires	Administrator log in
Pre-condition	Administrator log in
Post-condition	User received message
Procedure	After the system received message from users, administrator read the message then reply to user related to content of message



- Administrator Log in :

Table (3.12): Administrator Log in

Function	Administrator login
Description	This function allows the administrator only to login in the system
Inputs	Administrator login id , password
Outputs	Administrator page
Source	Login page
Requires	Valid log in
Pre-condition	Administrator registration
Post-condition	Administrator log in the system
Procedure	The administrator input his login id and password then the system send it to the database to validate it if is true the system open the administrator page



- Administrator Log out :

Table (3.13): Administrator Log out

Function	Administrator log out
Description	This function enable administrator to end his session
Inputs	Select log out link
Outputs	System login page
Source	Administrator page
Requires	Nothing
Pre-condition	Administrator login the system
Post-condition	End administrator his session
Procedure	The administrator select logout link to end his session and return to login page



- View Administrator his Data :

Table (3.14): View Administrator Data

Function	View administrator his data
Description	This function able administrator to view his data that is stored in database
Inputs	Select view administrator link
Outputs	View administrator his data page
Source	Administrator and administrator page
Requires	Administrator log in
Pre-condition	Administrator registration
Post-condition	View administrator his data
Procedure	Selecting view administrator his data link then the system request to the database and appear the administrator data to the web form





- Edits Administrator his Profile :

Table (3.15) : Edits Administrator Profile

Function	Edits administrator his profile
Description	This function enable the administrator to change his data that is stored in the database
Inputs	Input new administrator data
Outputs	New administrator data stored in database
Source	Administrator and edit administrator his data page
Requires	Administrator registration and log in to his account
Pre-condition	Old administrator data
Post-condition	New administrator data
Procedure	Administrator input new data want to change then click change button to stored new data in database



- Change Administrator Password :

Table (3.16) : Change Administrator Password

Function	Administrator changes his password
Description	this function allows the administrator to change his password
Inputs	Administrator login name and new password , administrator click change button
Outputs	New password saved in database
Source	Administrator session and change administrator password page
Requires	Administrator log in
Pre-condition	Old password
Post-condition	New password
Procedure	The administrator asked to input his login name and new password , if user name entered correct return message "your password change "



- Add Announcement:

Table (3.17): Add Announcement

Function	Add new announcement
Description	This function allows the administrator to add new announcement in the system.
Inputs	Announcement ID, subject, type of announcement, date of adds this announcement, date of end this announcement, and the source of the announcement, and the content of announcement.
Outputs	Message: The announcements add successfully.
Source	Administrator add announcement page.
Requires	Administrator login.
Pre-condition	Click on add new announcement button.
Post-condition	The new announcement saved in data base by clicking ads announcement.
Procedure	The admin login to the website and write the announcement in the specific page then send it to the user's phone numbers stored in the data base.



- Delete Announcement :

Table (3.18): Deletes Announcement

Function	Delete announcement exists in the data base.
Description	This function allows the administrator to remove announcement from the data base.
Inputs	Nothing.
Outputs	Announcement is deleted.
Source	Administrator delete announcement page.
Requires	Administrator login.
Pre-condition	Click on remove announcement button.
Post-condition	The announcement removed from the data base when clicking remove.
Procedure	The admin click on the delete button



### 3.4 System Context Diagram

Figure 2 show the system context diagram which describe the relationships between announcement system and other systems, where users and administrator enter their information and make certain access to the system. The administrator can add or delete users or announcements, the mobile is an external system where users can send SMS to the system and respond with announcement in the client mobile screen.

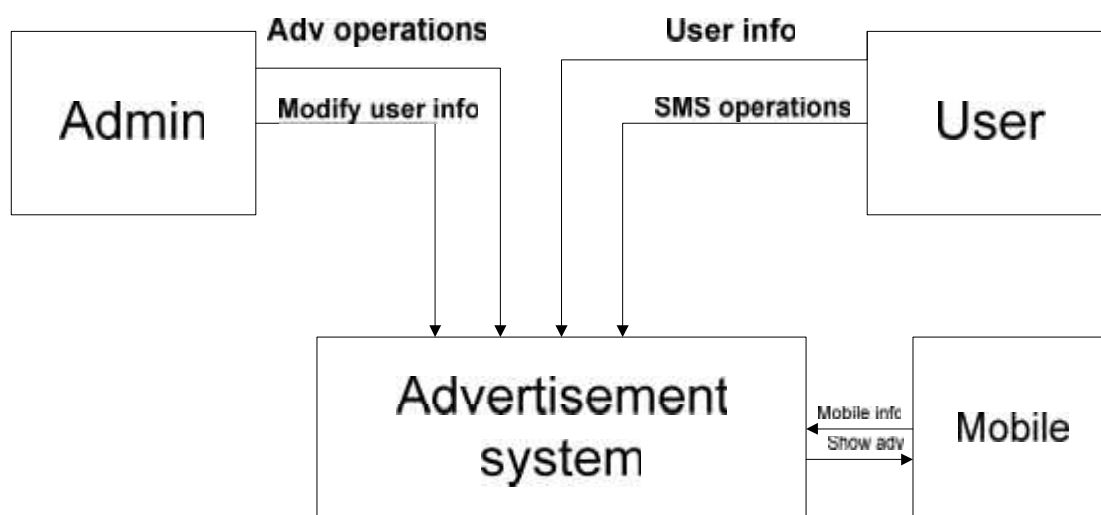


Figure (3.1): Context Diagram



### 3.5 Deployment Diagram

Figure 3 show the system deployment diagram.

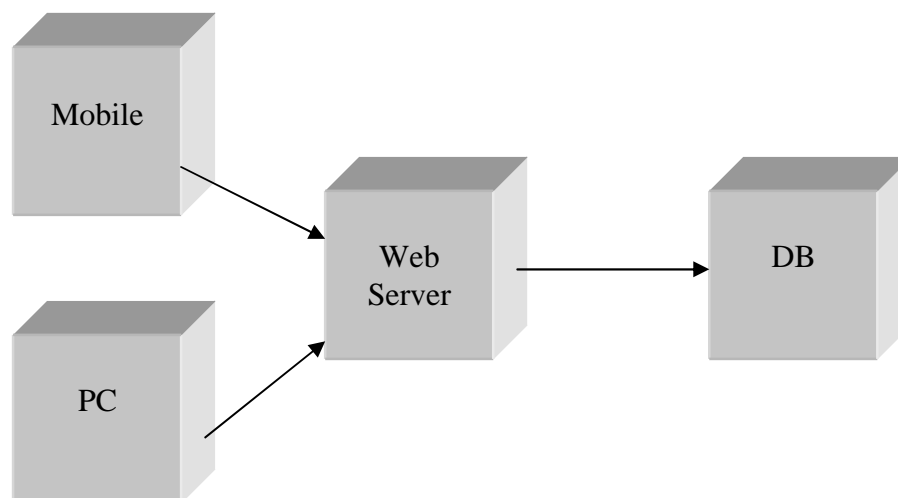


Figure (3.2): Deployment diagram

### 3.5 Data Flow Diagram

#### 3.5.1 Data Flow Diagram

Figure 3 describes the level 0 Data Flow Diagram describe (level 0) where the user register to the system by entering his information and store it in the data base, then the admin can modify user info, and modify announcements, then mobile capabilities checked by compare the text in the SMS message sent by user with text stored in the data base, then show announcement and go to (level1).

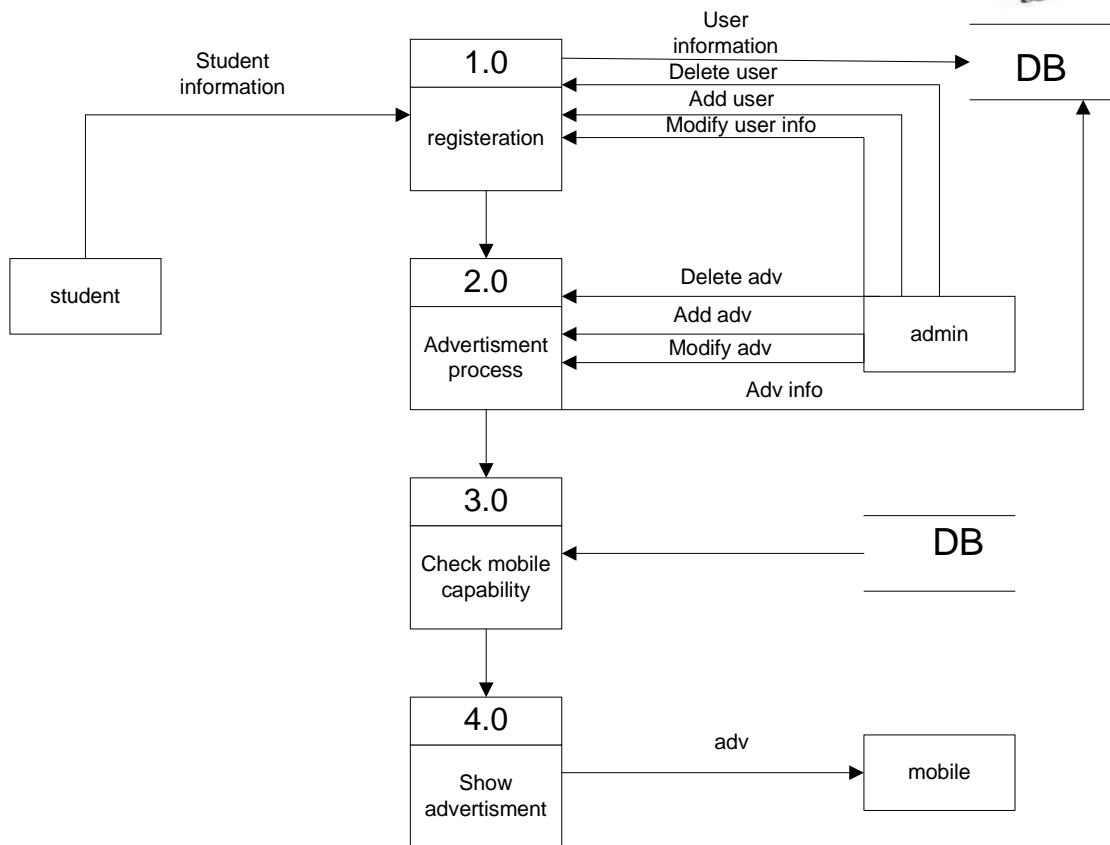


Figure (3.3): Data Flow Diagram- levels 0

### 3.5.2 Data Flow Diagram (level 1)

In level 1 the announcement is checked if to send as SMS or MMS, this depends on check mobile capabilities in level 0, and then the announcement is shown on the screen of user mobile.



Figure (3. 4): Data Flow Diagram -level 1

### 3.6 Database Data Dictionary

In this section we will describe tables; field name, length, and type, key.

#### Announcement table (Adv)

Table (3.19): Announcement

Field Name	Length	Type	Key	References
------------	--------	------	-----	------------





Id	10	Int	PK	
Subject	100	Varchar		
Body	100	Varchar		
Create Date	8	Datetime		
NOF Days	3	Varchar		
Type Id	10	Int	FK	Announcement Type

**Announcement Type Table (Adv\_Type)**

Table (3.20): Announcement Type

Field Name	Length	Type	Key
Tid	10	Int	PK
Name	50	Varchar	

**Announcementment\_MMS (Adv\_MMS)**

Table (3.21): Announcement\_MMS

Field Name	Length	Type	Key	References
------------	--------	------	-----	------------



Advid	10	Int	PK,FK	Announcement
Counter	10	Int	PK	
Path	50	URL		

**User Table:**

Table (3.22): User

Field Name	Length	Type	Key	References
Loginid	10	Int	PK	
PWD	10	Varchar		
UserKey	10	Varchar		
Phone #	10	Varchar		
Active	1	Boolean		
Groupid	10	Int	FK	User group
StdorEmp	1	Int		

**Student Table:**

Table (3.23): Student

Field Name	Length	Type	Key	References
------------	--------	------	-----	------------



SNO	10	Varchar	PK	
Name	10	Varchar		
StateId	10	Int	FK	State
MajorId	10	Int	FK	Major

**Employee Table (EMP)**

Table (3.24): Employee

Field Name	Length	Type	Key	References
Eno	10	Varchar	PK	
Name	10	Varchar		
On_duty	1	Boolean		
Cid	10	Int	FK	College

**State Table:**

Table (3.25): State

Field Name	Length	Type	Key
------------	--------	------	-----



Sid	10	Int	PK
Name	10	Varchar	

**User Group Table:**

Table (3.26): User Group

Field Name	Length	Type	Key
GId	10	Int	PK
Title	10	Varchar	

**Role Table:**

Table (3.27): Rule

Field Name	Length	Type	Key
RId	10	Int	PK
PageName	10	Varchar	

**Group Roles Table:**

Table (3.28): Group Roles

Field Name	Length	Type	Key	References
------------	--------	------	-----	------------



GId	10	Int	PK,FK	User group
RoleId	10	Int	PK,FK	Role

**College Table:**

Table (3.29): College

Field Name	Length	Type	Key
CId	10	Int	PK
Name	10	Varchar	

**Major Table:**

Table (3.30): Major

Field Name	Length	Type	Key
MId	10	Int	PK
Name	10	Varchar	
DeptId	10	Int	FK

**Department Table:**

Table (3.31): Department



Field Name	Length	Type	Key	References
MId	10	Int	FK	Major
Name	10	Varchar		
DeptId	10	Int	PK	

**Device Table:**

Table (3.32): Device

Field Name	Length	Type	Key
ID	10	int	PK
XML_ID	128	varchar	
User_agent	255	varchar	
Fall_back	128	varchar	
Actual_device_root	10	int	

**Capabilities Table:**

Table (3.33): Capabilities



<b>Field Name</b>	<b>Length</b>	<b>Type</b>	<b>Key</b>	<b>References</b>
Id	10	int	PK	
Device_id	10	Int	FK	Device
Name	128	varchar		
Value	128	varchar		



## 4.1 Initiation

In this chapter we want to describe the system design that have objects design for each module, we describe each method as a function by designing it, we describe the database model and the input output design , and test plan.

This section covers the following:

- Functional design
- Description
- Interface
- Flowchart
- Constraint
- User interface design

## 4.2 Functional Designs:

Functional design for each model should described in the software system, it describe the interface, the constraints, and the user interface design.

### 4.2.1 The Function Design for User is:

#### 1) User Log in

- ❖ **Description:** this function provides ability for the user to log in to his web form.
- ❖ **Interface :**
  - **Input:** Username and password.
  - **Output:** User web form if the username and password true, error messages if he enters invalid username or password.
- ❖ **Constraints:**
  - All inputs must fill correctly.
  - Username must number only (6 character at least).
  - The password must be at least 6 characters.
  - Password must equal conform password.
  - Password must not equal phone#.





❖ *Flowchart*

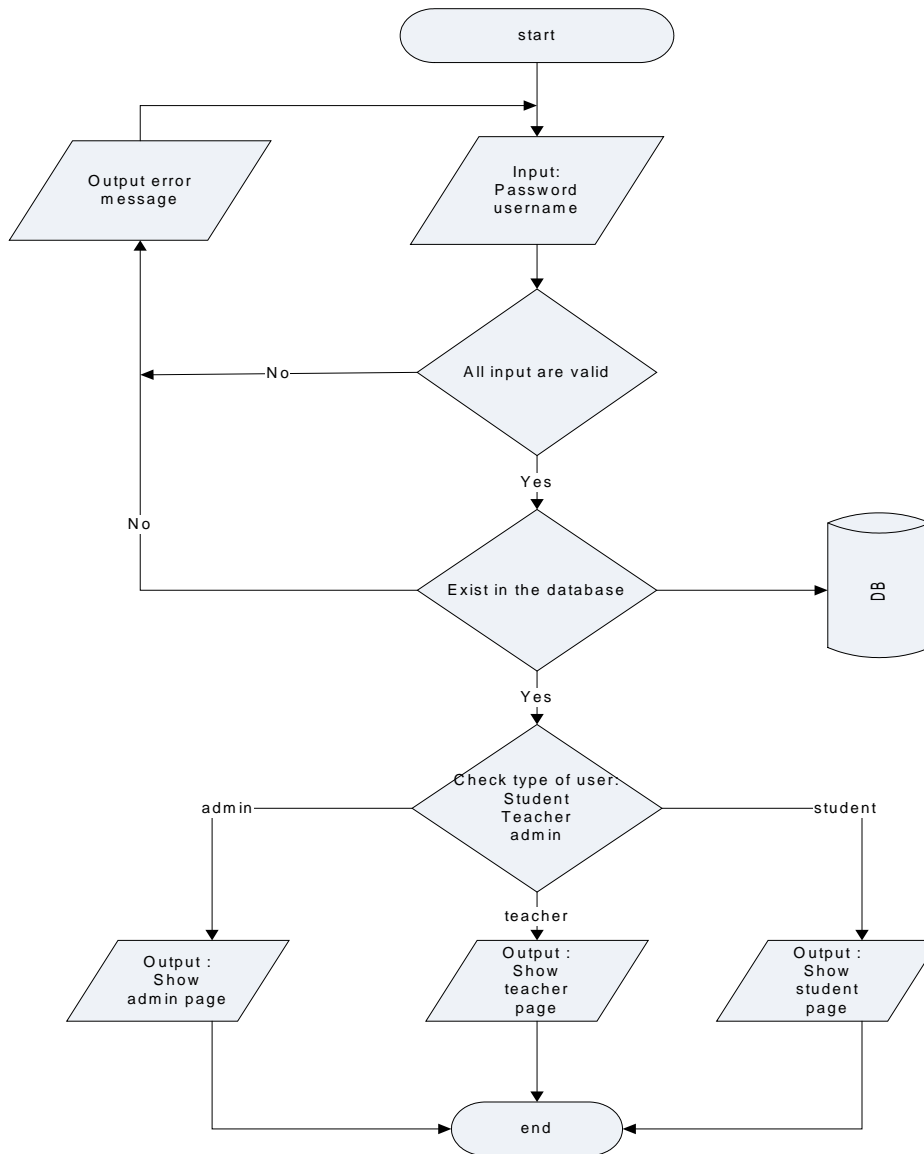


Figure (4.1): User Login



## 2) User Forgotten Password

❖ **Description:** this function allows user to get his password from the system.

❖ **Interface :**

- **Input:** Username, and secret question.
- **Output:** Forgotten Password

❖ **Constraints:** None.

❖ **Flowchart**

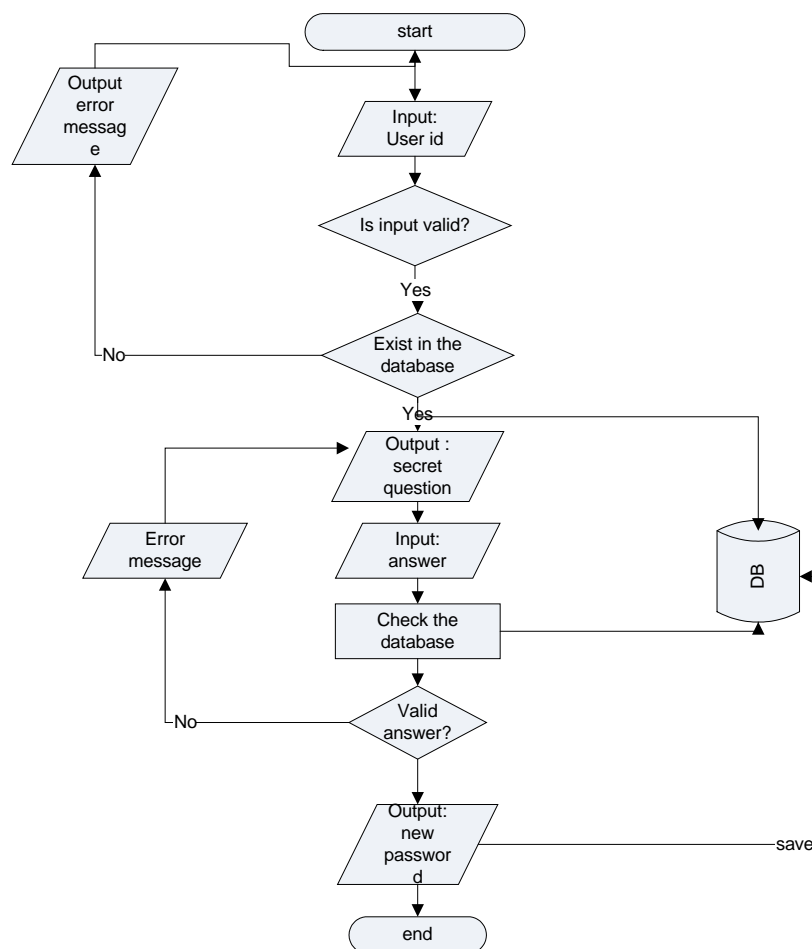


Figure (4.2): User Forgotten Password



### 3) User Change Password

❖ **Description:** in this function user has the ability to change his password and replace it by a new one and confirm it.

❖ **Interface :**

- **Input:** user old password, new password, and confirm new password.
- **Output:** password updated and saved in db.

❖ **Constraints :**

- New Password must be numbers only (6 character at least).
- The new password and its confirmation must be match.
- New password will be used in the next log in.

❖ **Flowchart :**

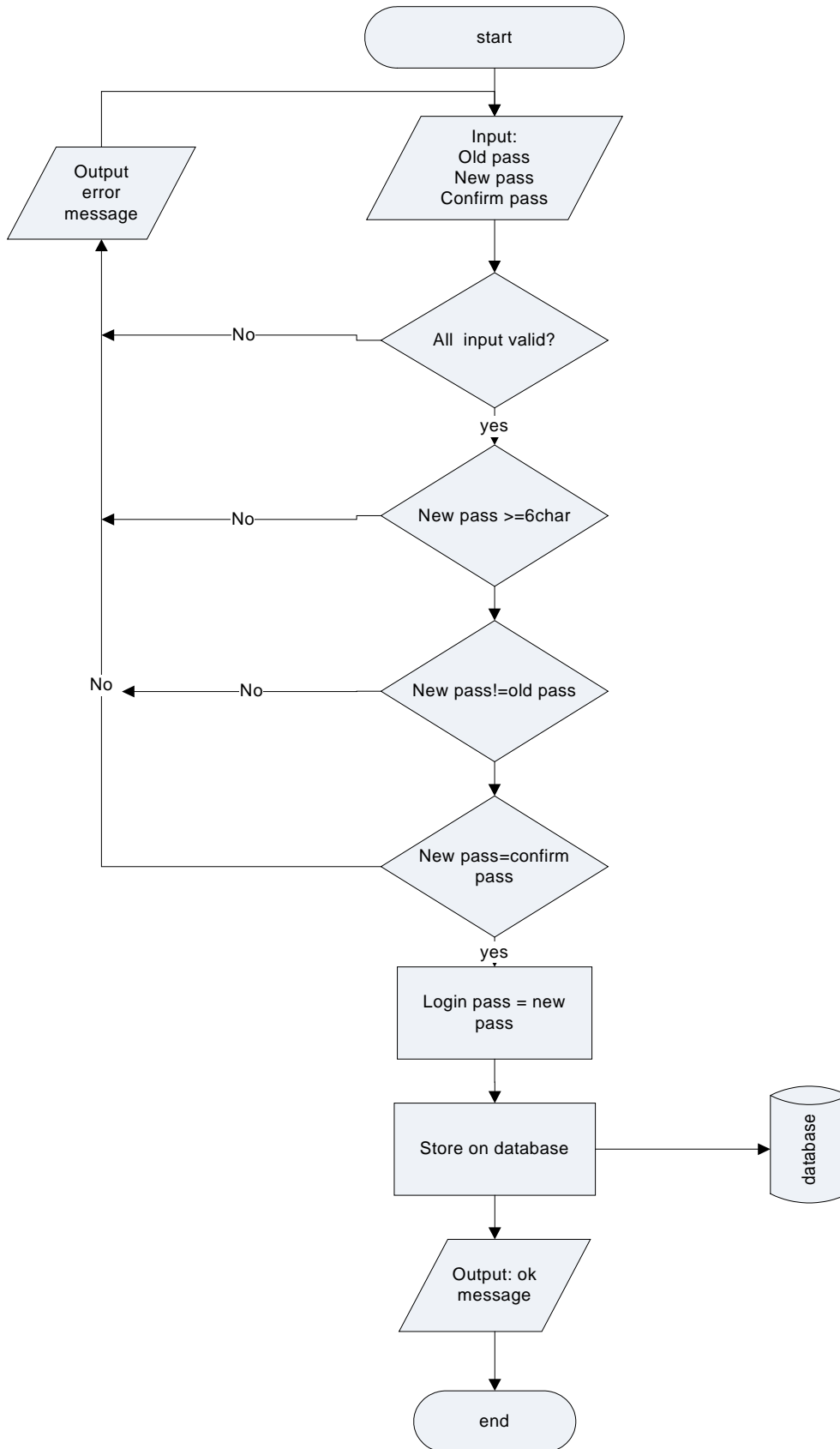


Figure (4.3): User Change Password



#### 4) User Sending Text Message

❖ **Description:** this function enable user to request university announcement.

❖ **Interface :**

- **Input:** text message.
- **Output:** message sent

❖ **Constraints :**

- Text message should be capable with the message format in db

❖ **Flowchart:**

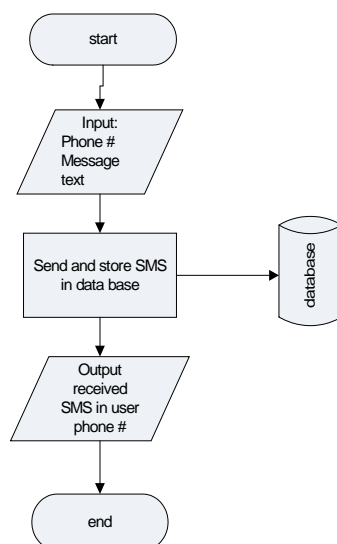


Figure (4.4): Sending Text Message

#### 5) User View Announcement

❖ **Description:** this function enable user to view the university announcement that uploaded on the system.

❖ **Interface :**

- **Input:** select announcement link, type.
- **Output:** university announcement page

❖ **Constraints :**

- User should be login to the system



❖ **Flowchart**

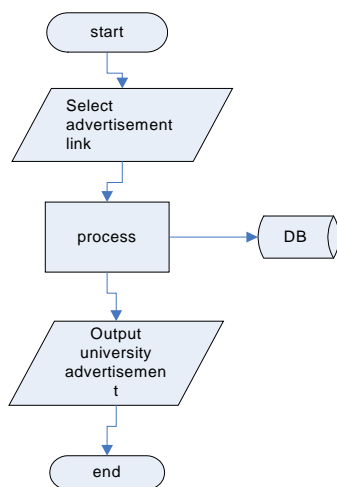


Figure (4.5): User View Announcement

**4.2.2 The Function Design for Administrator is:**

1) Send Announcement to User

❖ **Description:** this function allows the administrator to send announcement to user.

❖ **Interface :**

- **Input:** user phone number.
- **Output:** announcement send.

❖ **Constraints :**

- NONE

❖ **Flowchart**

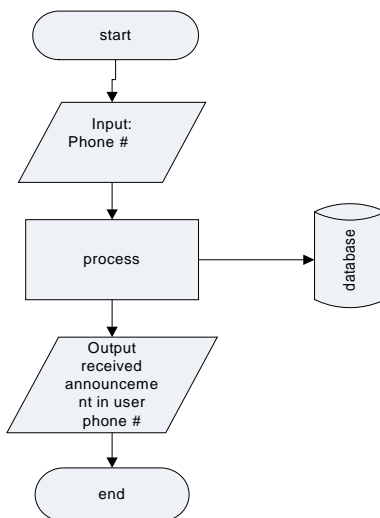


Figure (4.6): Send Announcement to the User



2) Delete Announcement

- ❖ **Description:** this function allows the administrator to delete announcement from system.
- ❖ **Interface :**
  - **Input:** announcement number, select delete announcement #.
  - **Output:** announcement deleted from database.
- ❖ **Constraints :**
  - All fields of the announcement should be deleted when the announcement number entered and click at delete button

❖ **Flowchart**

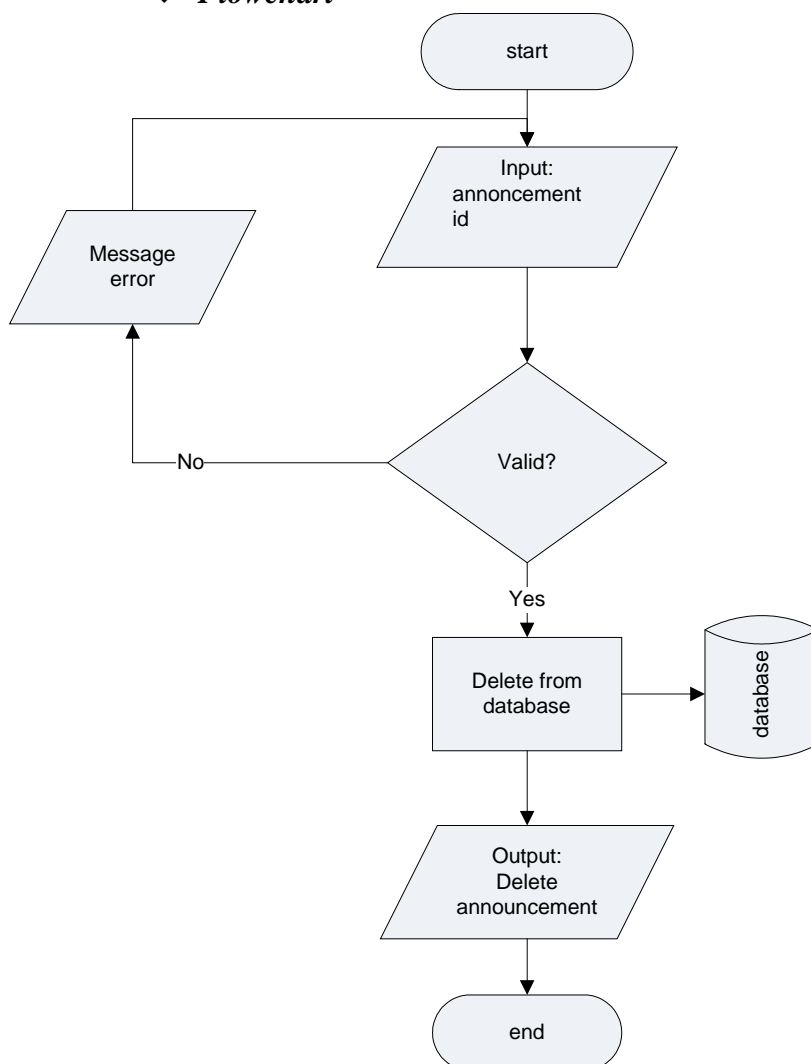


Figure (4.7): Delete Announcement



### 3) Add Announcement

❖ **Description:** this function allows the administrator to add announcement to the system.

❖ **Interface :**

- **Input:** announcement id, subject, create date, number of day, type of announcement.
- **Output:** new announcement add to the database.

❖ **Constraints :**

- NONE

❖ **Flowchart**

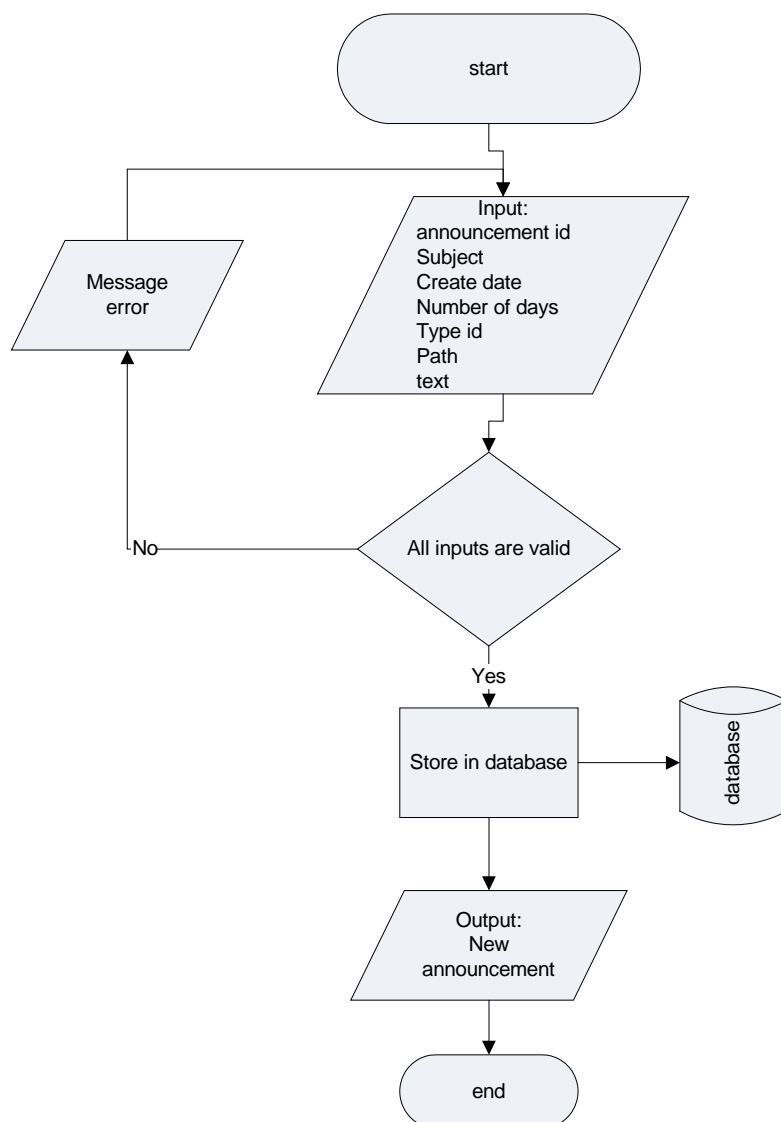


Figure (4.8): Add New Announcement





#### 4) User Help

❖ **Description:** this function allows the user how to use the system.

❖ **Interface :**

- **Input:** select help link
- **Output:** help page.

❖ **Constraints :**

- NON

❖ **Flowchart**

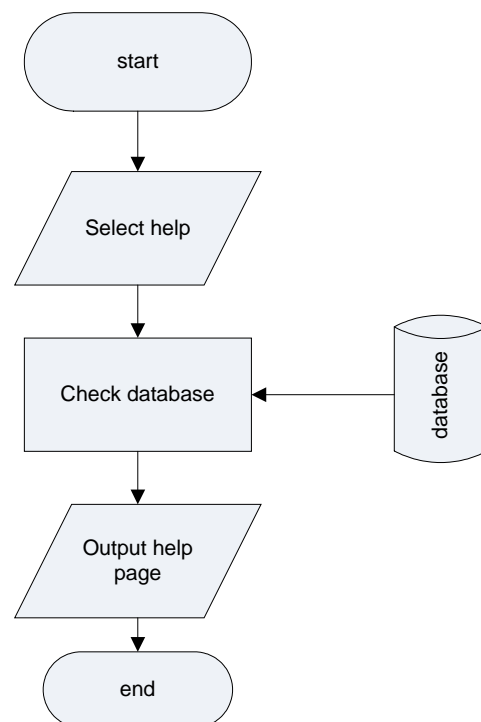


Figure (4.9): User Help

#### 5) User Registration

❖ **Description:** this function allows the user to register in the system.

❖ **Interface :**

- **Input:** User id, Username, Phone #,Group type,Email,Confirm email ,pass, Confirm pass, Secret Question, Secret answer
- **Output:** confirm message



❖ *Constraints :*

- All inputs must fill correctly.
- The password must be at least 6 characters.
- Password must equal conform password.
- Password must not equal phone#.

❖ *Flowchart*

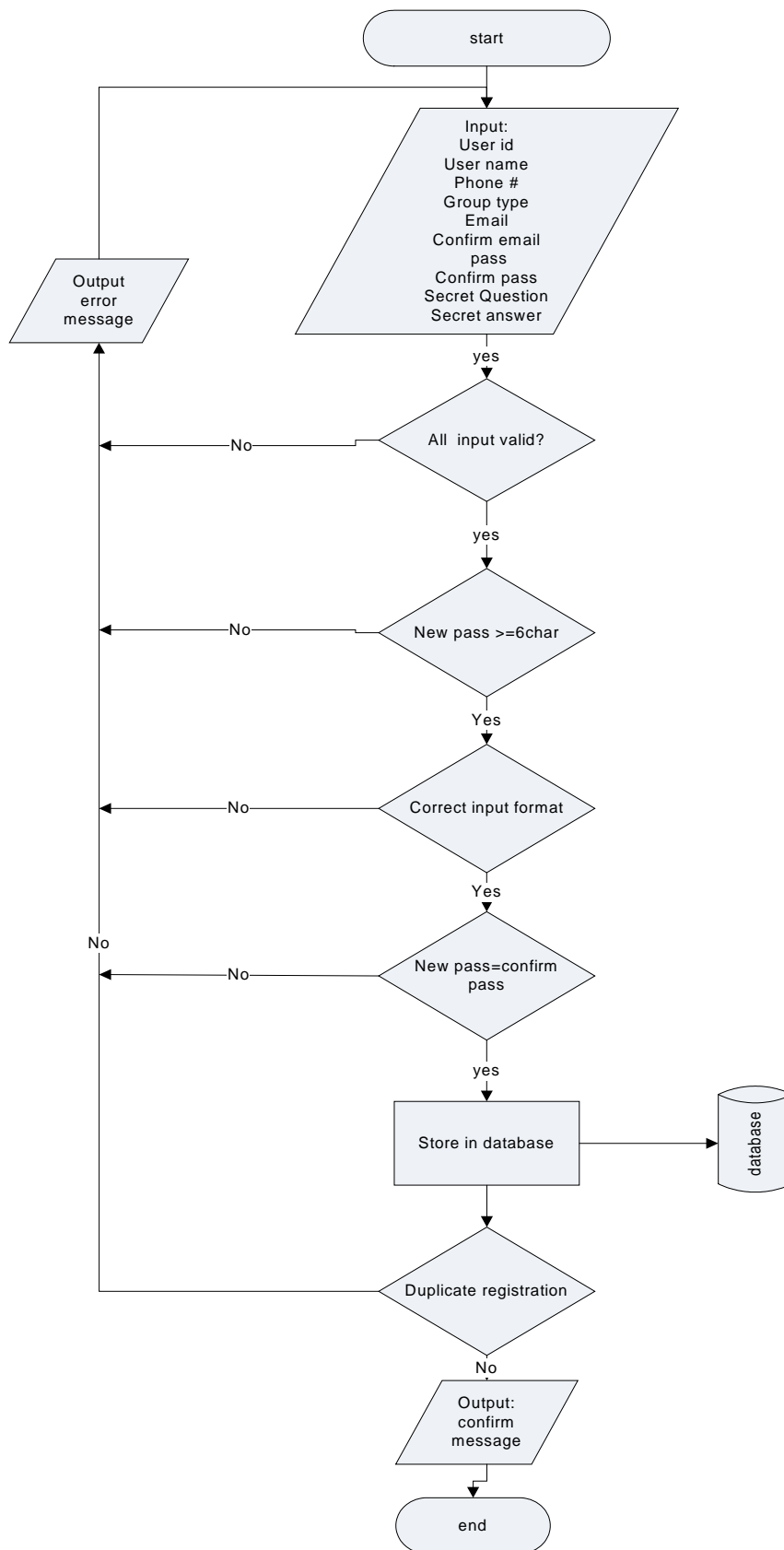


Figure (4.10): User Registration

### 4.3 System Interface Design :



In this section we show the input/output screens. The screens show how the functions work, and how the user can interact with it.

In this system we have two interface designs (student and administrator interface design)

### 4.3.1 User Login

In this screen the user login to the system by entering his username and password in the box below:

Figure (4.11): User Login form

### 4.3.2 User Registration

In this form the user can register in the system by entering many information and when he doesn't enter any of them the constraint will be appear, and this explained below:

Figure (4.12): User Registration form

### 4.3.3 User Lost Password



In this screen the user recover his password by entering his username, secret question and secret answer in the box below:

Figure (4.13): Forgotten Password form

#### 4.3.4 User Change Password

In this form the user can change his password by entering his username, new password, and confirm password in the box below:

Figure (4.14): Change User Password form

#### 4.3.5 User View Data

This form contains the user data that stored in data base

Figure (4.15): View User Data form

#### 4.3.6 View User Announcement



This form allows users to view the announcement by interning source, college and type of announcement

**view announcement**

*source*      select: type source      Required

*college*      select: college      Required

*type*      select: type of announcement      Required

Figure (4.16): View User Announcement form

### 4.3.7 Add Announcement

This form allows administrator to add new announcement

**Add Advertisement**

*Subject*      Required

*# OF Day*      Required

*source*      Required

*College*      Required

*Type ID*      Required

*Text*      Required

*Path*      Required

Figure (4.17): Add Announcement form

### 4.3.8 Delete Announcement

This form allows administrator to delete announcement

**Delete Announcement**

Subject      required

Type ID      Required

Figure (4.18): Delete Announcement form

### 4.3.9 Admin Page



This form allows administrator to do some operation explained below:

**Admin Main Page**

- Change Password
- Delete Announcement
- Add Announcement
- Show Announcement
- Change User Password
- View Users

Figure (4.19): Administrator Page form

#### 4.3.10 User Page

This form allows user to do some operation explained below:

**User Main Page**

- Change Password
- Show Announcement
- User View his data
- Edits Profile

Figure (4.20): User Page form

#### 4.4 Database Design



### 4.4.1 Database Model

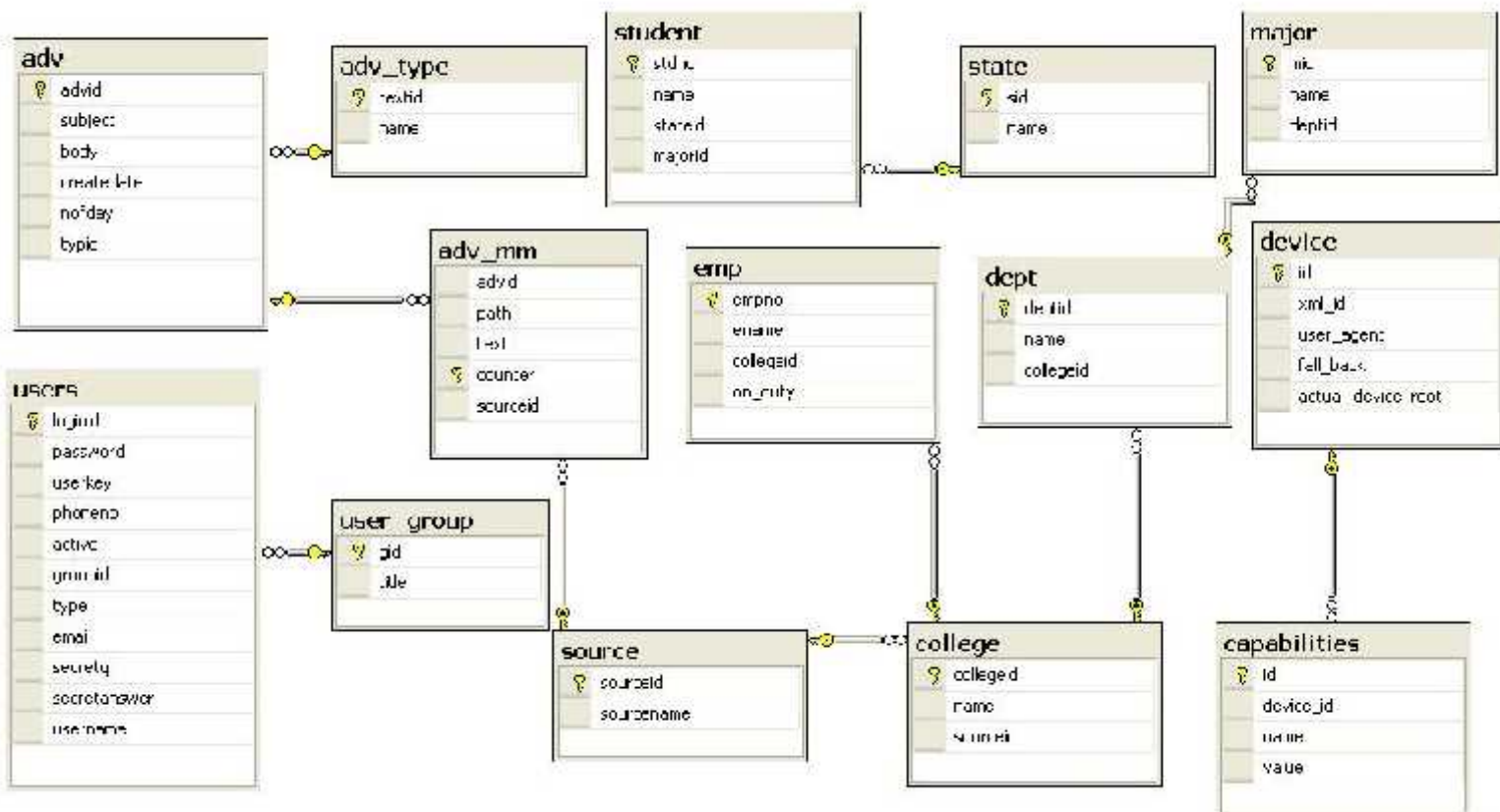


Figure (4.21): Database Model

### 4.5 Test plan:

Test plan include many steps that used to test the system to ensure that the system perform its operation perfectly, now we will describe the testing steps.

#### Testing steps:

##### 1. Unit Testing:

Here we test each unit separately in the system to ensure that each One meet its requirement in the system and operate correctly.

##### 2. Sub-System Testing:





Subsystem testing that depends on testing the related system components, so it can be tested individually.

### **3. Integration Testing:**

The integration testing which depends on testing all components together as a whole system to ensure that the system meets its requirements.

### **4. WAP display testing :**

WAP display testing is done to make sure that WAP pages are displayed on all types of phones.

## **4.6 Programming Language and Coding**

Here we describe advantages of Visual Studio.NET 2005 and why our selection was on it.

- Security: have high security in transferred data, and support validation that ensure the user's inputs before doing any operation.
- Ease of use.
- Reduce development time.
- Support AT command.
- It suitable for deal with mobile application.
- Debugging support.
- Provide suitable interface.
- Compatibility with windows environment.
- Compatibility with database.



## 5.1 Initiation

In this chapter we will talk about the main idea of our project; it's about content adaption, as we said in the last chapters that our system will send announcements to users depending on the users mobile phone capabilities in adaptable way. In this chapter, we discuss in details the meaning of adaptability, and how to adapt, and the adaptation alternative methods of adaption content.

We did all what we can to give readers a main idea about adaptation, to understand the project objectives.

## 5.2 What is Adaptation?

Adaptation, sometimes called multiserving, means delivering content as per each user device's capabilities. If the visiting device is an old phone supporting only WML, the system will show a WML page with Wireless Bitmap (wbmp) images. If it is a newer XHTML MP-compliant device, it will deliver an XHTML MP version, customized according to the screen size of the device.

## 5.3 How does I Adapt?

We have three options to adapt:

- Design alternative CSS: this will control the display of elements and images. This is the easiest method. You can detect the device and link an appropriate CSS file.
- Create multiple versions of pages: redirect the user to a device-specific version. This is called "alteration". This way you get the most control over what is shown to each device.
- Automatic Adaptation: create content in one format and use a tool to generate device-specific versions. This is the most elegant method.



## 5.4 Device Characteristics

- **Screen resolution.** This is a very important characteristic during the process of adaptation because at present there is big variety of screen resolutions – from small ones of the cell phones to the large ones of Notebooks.
- **Supported markup and script languages.** The determination of these characteristics is important especially for adaptation of (X)HTML web pages which use JavaScript, because not all web browsers for PDAs and smart phones support all JavaScript functions (for example MS Internet Explorer and MS Deep fish). The mobile phones which respond to the standard WAP 1.x support WML and WMLScript, while those of them which respond to the standard WAP 2.0 support XHTML.
- **Supported multimedia file formats.** In order to play appropriate Multimedia elements on a mobile device with a particular web browser it is important to determine which of them are supported. The method/methods for recognition of the defined mobile devices characteristics have to be selected too. Currently, servers and proxies can determine the identity of a particular device using the request header field in the HTTP protocol. In addition there are three alternative methods:
  - 1- The Composite Capabilities/Preferences Profiles (CC/PP),
  - 2- The WAP User Agent Profile (UAPROF) standard.
  - 3-and Wireless Universal Resource File (WURFL).

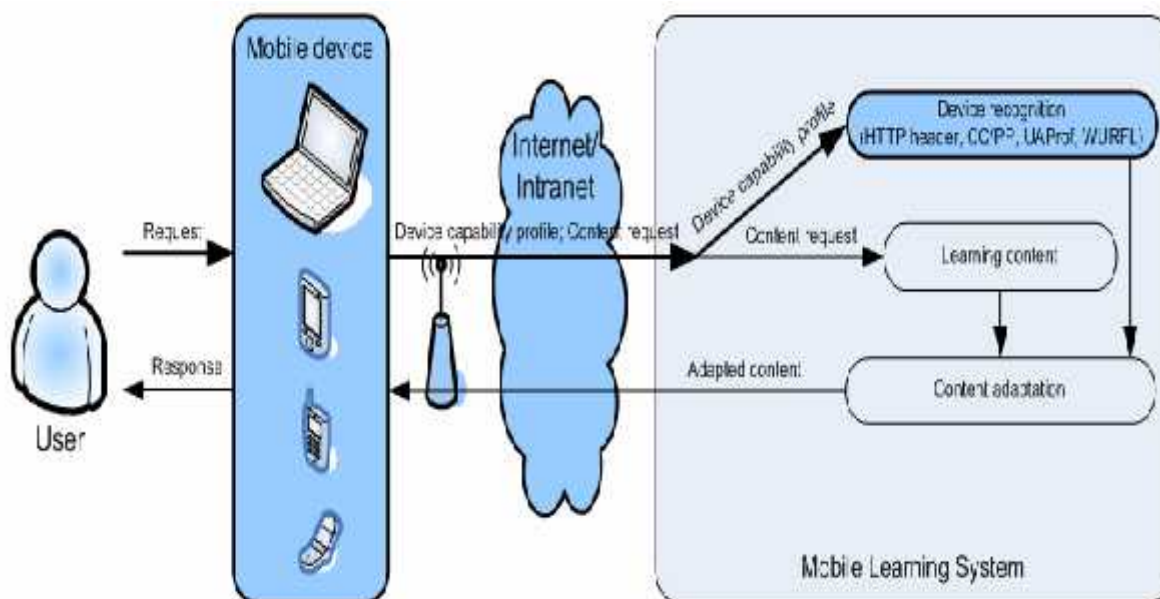


Figure (5.1): Device recognition module as a part of Mobile Learning System

### 5.5 HTTP User-Agent Headers

The web browsers and servers use the HTTP protocol to transfer information on the WWW. It includes a mechanism for content presentation which browsers can accept. The server decides what kind of information to send depending on the device profile. Each HTTP request includes Accept Header, which indicates the types of data, which the browser can accept. In addition to the Accept Header the client sends User-Agent Header. It identifies the client device and contains information about the browser, operating system and sometimes hardware information.

As the number and the kind of devices, which have internet connection, constantly grow up, the need of content designed to different devices also grows up. That's why the information from User-Agent Header is not sufficient.

### 5.6 How to Detect User Agents?

Before we move on to discuss how to detect user agents, let's first have a look at the steps involved in a typical request-response cycle between a server and a client browser:

- The WAP browser requests an XHTML page from the server.



- The server receives the request and delivers the XHTML document to the WAP browser.
- The WAP browser receives the XHTML document and finds that it contains a <link> tag that references to an external cascading style sheet.
- The WAP browser sends another request to the server in order to obtain the WAP CSS cascading style sheet.
- The server receives the request and delivers the WAP CSS cascading style sheet to the WAP browser.
- The WAP browser receives the WAP CSS file and displays the XHTML page according to the style information contained in the WAP CSS file.
- The steps repeat when the user selects an anchor link or types a new URL in the WAP browser.

As you can see from above, the only thing that the server receives from the client is the HTTP request. So, to determine the client's user agent, the server needs to rely on the information included in the HTTP request.

The profile header holds the URL to the UAProf (User Agent Profile) document of the wireless device. The UAProf document contains information about the wireless device's characteristics and capabilities such as screen size, character sets supported number of soft keys supported, etc.

The user-agent header includes information like the wireless device's name, platform, Java capabilities, etc. The format of the user-agent header value is different for different brands of browsers. For example, the user-agent header format generated by Nokia mobile phone browsers is different from that generated by Sony Ericsson mobile phone browsers. Here is a user-agent header generated by Sony Ericsson Z1010:

User-Agent: SonyEricssonZ1010/R1A SEMC-Browser/4.0



## 5.7 How to Read the Value of a HTTP Header?

To read the value of a HTTP header, you need to use a server-side technology like ASP, Java Servlet, JSP, Perl, PHP, etc.

For example, to read the user-agent header value and store it into a variable *uaheader* with JSP, use the following code:

```
String uaheader = request.getHeader ("user-agent");
```

For ASP (VBScript), use the following code to read the user-agent header value:

```
Dim uaheader
uaheader = Request.ServerVariables ("http_user_agent")
```

For ASP (JScript), use the following code to read the user-agent header value:

```
var uaheader = Request.ServerVariables("http_user_agent");
```

For PHP, use the following code to read the user-agent header value:

```
$uaheader = $_SERVER ["HTTP_USER_AGENT"];
```

## 5.8 The HTTP request will be processed on the server in three main stages:

### 1. The first process is:

- Identifying the requesting device and the capabilities of that device: browser, mark up language, and image capabilities.
- The Microsoft Mobile Internet Toolkit extends the .NET Framework Machine.config schema with mobile device capabilities and pre-populates the device data. The machine.config file applies to all applications on the server and the web.config file applies to specific application or v-root.



- The HTTP request from the mobile device contains the User Agent string, Header information and URL that is being requested. The User Agent string is matched against entries in the machine.config file.

## 2. The second stage is:

- The URL from the HTTP request is then used to locate the corresponding mobile Web page which will have a .aspx file extension.
- The first time an ASPX page is accessed the page will be compiled. The ASPX page will be sent to the parser. Once the page has been parsed it will be processed by the compiler. The compiled page is then stored in the Assembly Cache. The server then creates a new instance of the compiled page, and uses it to process the request.
- Once the page has been compiled, the parsing and compiling steps do not need to be repeated for each request – the compiled page class can be reused, resulting in improved performance.

## 3. The third stage is:

- After the ASPX page has been compiled; the page and the Mobile Controls used on it are instantiated. The business logic contained on the ASPX page is then executed. The business logic includes data retrieval, XML Web Services, or server side objects. This same business logic used in the mobile Web applications may also be used by desktop Web applications.
- The device adapters associated with the requesting device and controls used on the page then generate the appropriate mark-up language, such as HTML or WML.
- The appropriate mark-up language (HTML or WML depending on the device type) is then encapsulated in an HTTP response and returned to the requesting mobile device.



## 5.9 Composite Capabilities / Preferences Profiles (CC/PP)

The specification Composite Capabilities/Preferences Profiles (CC/PP) from World Wide Web Consortium documents a standard way, which allows devices to transmit their configuration details and capabilities (screen resolution, audio characteristics, frequency band) to web servers. CC/PP specification provides universal profile that describes the devices' characteristics. CC/PP is designed to be independent. The connected specifications as UAPROF, unlike CC/PP, define a variety of dictionaries describing the devices' characteristics.

### Two ways to use CC/PP profiles

- Selection

If the web server has a set of pre-written web pages, suitable for a number of different devices, then the profile can be used to decide which of these pre-written pages is most suitable for the web browser.

- Transformation

Web page content can be kept in a neutral format (e.g. XML). This can then be transformed into an appropriate format, using the profile to decide what that format is.

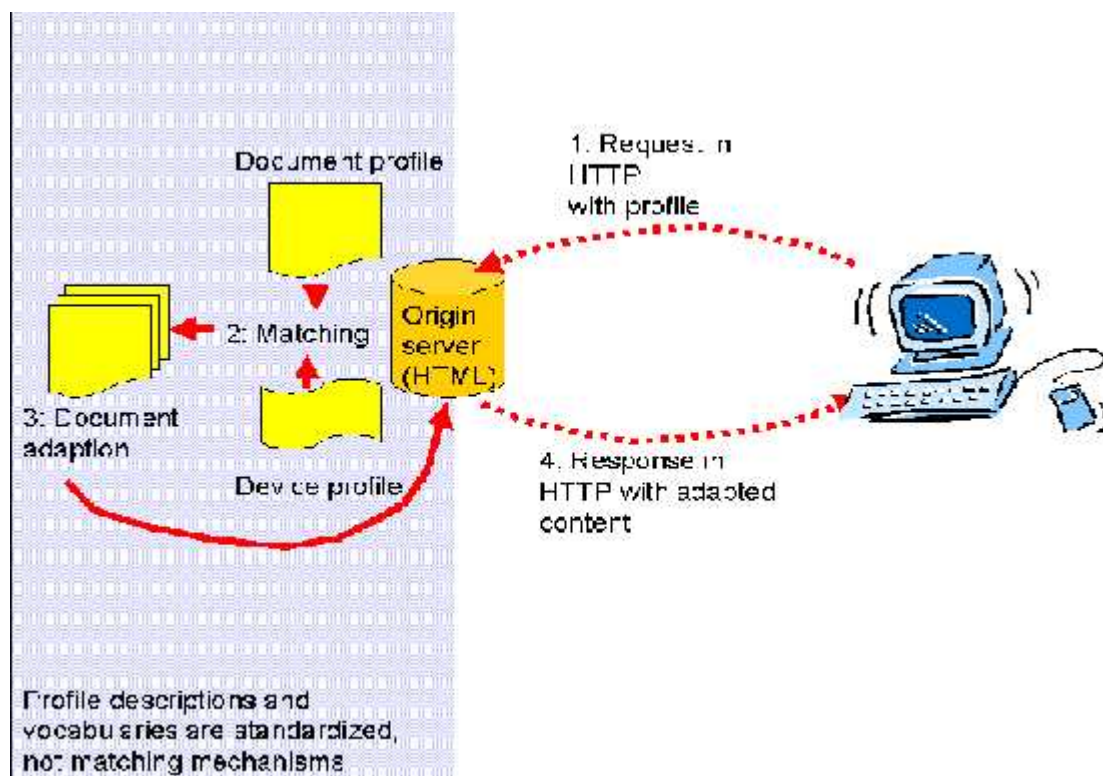


Figure (5.2): Content Adaptation





## 5.10 WAP User Agent Profile (UAPROF)

Another way to identify the user device profile is using the User Agent Profile specification. It is a specific CC/PP dictionary describing mobile devices and defining an effective way for CC/PP content transition via wireless nets. Mobile phones conformed to UAPROF specification provide CC/PP description of their characteristics on a server. Content servers, gateways and proxy servers can use this information and optimize the content for the device of a consumer. The information is in XML format. When a mobile device sends request to server, it also sends an URL address to its mobile profile. This is carried out by adding of X-Wap-Profile Header to the request. This header indicates the server where to find the device profile. The content server extracts the necessary information for the client from device profile repository and can store it, so that it can be used later. WAP gateway or HTTP proxy must support working of UAPROF header.

### User-Agent Profile

User-Agent (UA) is an application that communicates with the Web site or a server from a mobile phone using a Web browser.

User-Agent Profile (UAProf) is used for capturing wireless device information such as device capabilities and network setting via the mobile service network, so this information can be used by content providers to produce content in an appropriate format for specific devices. When a client visits a Web site or a server, a string is generally sent to identify the User-Agent Profile to the server. The intent of the User-Agent Profile is to capture more information about the User-Agent than can be described by the User-Agent header.

The communication flow of a User-Agent Profile (shown in Figure 1) is sent from the handset to the content server via the mobile service network and WAP proxy. The User-Agent Profile is sent from the handset as a URL referencing the User Agent Profile document storage location. For example, the Motorola V3i User Agent Profile can be found at:

<http://motorola.handango.com/phoneconfig/v3i/Profile/v3i.rdf>



In order to format the content and verify User-Agent capabilities, the content server can download the User Agent Profile information from the URL provided by the handset

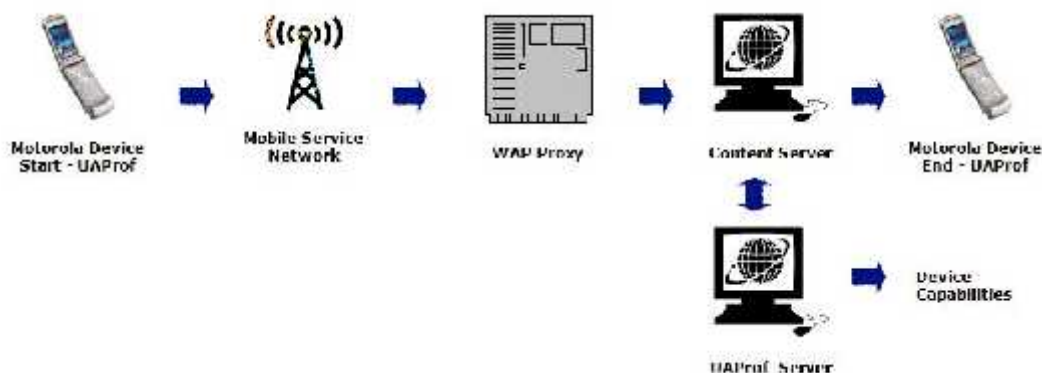


Figure (5.3): Communication flow of a User Agent Profile

Below is a subsection of the User Agent Profile information for the V3i

```
<prf: BrowserName>MIB</prf: BrowserName>
<prf: BrowserVersion>2.2.1</prf: BrowserVersion>
<prf: FramesCapable>No</prf: FramesCapable>
<prf: TablesCapable>Yes</prf: TablesCapable>
<prf: JavaAppletEnabled>No</prf: JavaAppletEnabled>
<prf: JavaScriptEnabled>No</prf: JavaScriptEnabled>
```

This example shows that a content server can determine that JavaScript is not supported by the handset, and should therefore be removed from the content being sent to the device.

Drawbacks depending on UAProf are:

- not all devices have UAProfs (including many new Windows Mobile devices, iDen handsets, or legacy handsets)
- Not all advertised UAProfs are available (about 20% of links supplied by handsets are dead or unavailable, according to figures from UAProfile.com)
- UAProf can contain schema or data errors which can cause parsing to fail



- Retrieving and parsing UAProf's in real-time is slow and can add substantial overhead to any given web request: necessitating the creation of a Device Description Repository to cache the UAProf's in, and a workflow to refresh UAProf's to check for deprecation.
- There is no industry-wide data quality standard for the data within each field in a UAProf.
- The UAProf document itself does not contain the user agents of the devices it might apply to in the schema (Nokia put it in the comments).
- UAProf headers can often be plain wrong. (i.e. for a completely different device)

### 5.11 Wireless Universal Resource File (WURFL)

The mobile device profile can be identified using the open source project Wireless Universal Resource File (WURFL). It is a configuration file containing information about the features of mobile devices offered on the market. The main goal of the developers of this file is to support maximum information for existing wireless devices that have an access to WAP pages. WURFL project has some advantages compared to UAPROF:

- WURFL file can be stored on a server and it is not necessary to be accessed remotely.
- Each device characteristics can be shaped.

### 5.12 Content adaptation on the web

The problem of content adaptation is well-known for text documents on the web and is related to web publishing. The issue is to publish the same text document in different versions adapted to the capabilities of the rendering device. For this

Purpose, the structure of the document must be separated from its presentation: the source document is structured with XML and then dynamically processed to generate a presentation tailored to the available resources, *e.g.* respectively in HTML or WML for respectively a web or WAP browser. This processing may be performed by XSLT style sheets, the W3C language specifying XML-to-XML transformations. The overall framework principle is described hereafter: answering a client request for a resource, the server first exchanges its capabilities with the client in a content



negotiation stage to determine the adapted version to be published. It chooses the relevant XSLT transformation, applies it to the source XML document, and returns the resulting XML presentation. As an example of implementation we can mention *Cocoon* developed by the Apache project to provide a complete separation between document content, style and logic into distinct XML files and uses XSLT capabilities to merge them.

### 5.13 Multimedia content adaptation with XML

In this section we detail a new solution for describing the content of a multimedia bit stream using XML technologies with the purpose of exploiting its scalability. Our approach is situated directly above the media element and is therefore complementary to other techniques dedicated to the adaptation of composite multimedia documents. In the terminology used below, a multimedia document is a single media unit (and not a composite media).

In **Figure 4**, consists in the following three steps: In a first step, an XML representation is generated from a multimedia bit stream, describing its high-level structure. Then, the XML representation is transformed by an XSLT style sheet which corresponds to the editing operations to be performed on the bit stream. Lastly, a new, adapted bit stream is generated back from the resulting XML document.

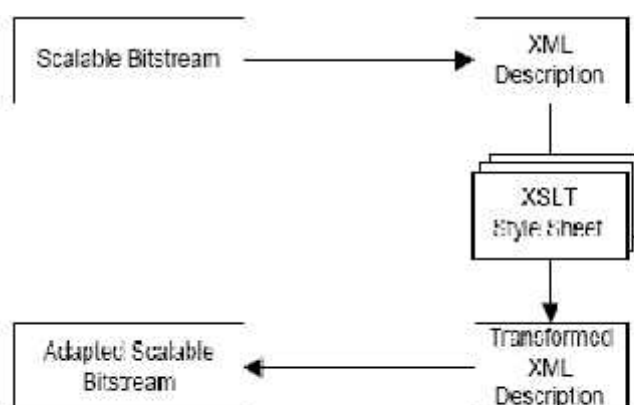


Figure (5.4): Multimedia Content Adaptations with XML



## 6.1 Initiation

As the world become more complex, the computer-based systems that inhabit the world must also increase in complexity, so you need UML (Unified Modeling Language) to organize the design process in away that clients, analysts, programmers and others involved in system development can understand and agree on .

The unified modeling language UML is a general-purpose visual modeling language that is used to specify, construct, and document the artifacts of a software system.

UML provides ease of maintenance by providing more effective visual representations of the system, and so maintenance costs will reduce.

In this chapter we will use UML to represents some processes in our announcement system

This chapter includes these UML types:

- Use-case diagram
- Sequence diagram
- Class Diagram

## 6.2 Use Case Diagrams:

Use case diagrams represent the interaction between the users and the system, and for understanding the system requirements presented in previous chapters.

By using use case diagrams, we describe functions to how to deal with our system.



### 6.2.1 System Use Case

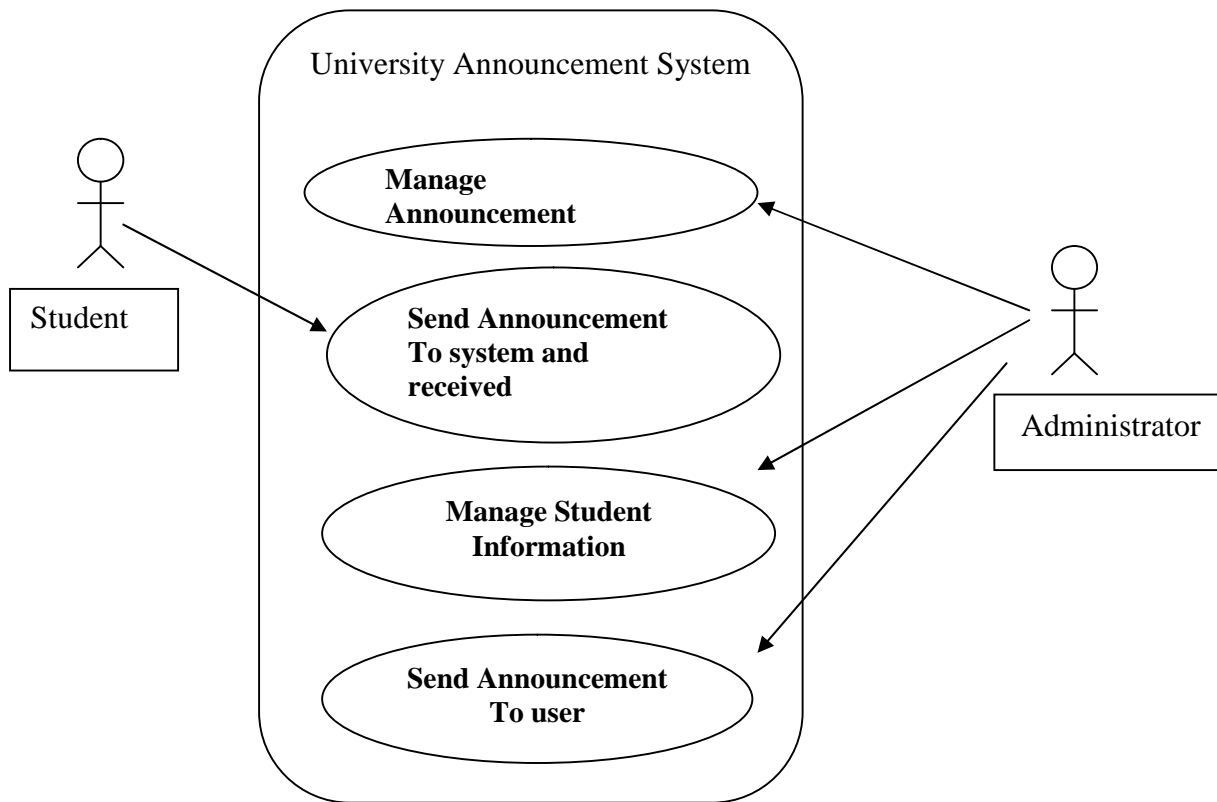


Figure (6.1): System Use Case

Figure 1 represents system use case diagram and the interaction between the user who wants to see the announcements and the announcement system.

### 6.3 Sequence Diagram

Sequence diagram used to show interactions between objects in the system, in this section we describe in details the interaction between objects of the system that occurs really in the implementation of the system.



### 6.3.1 System Sequence Diagram

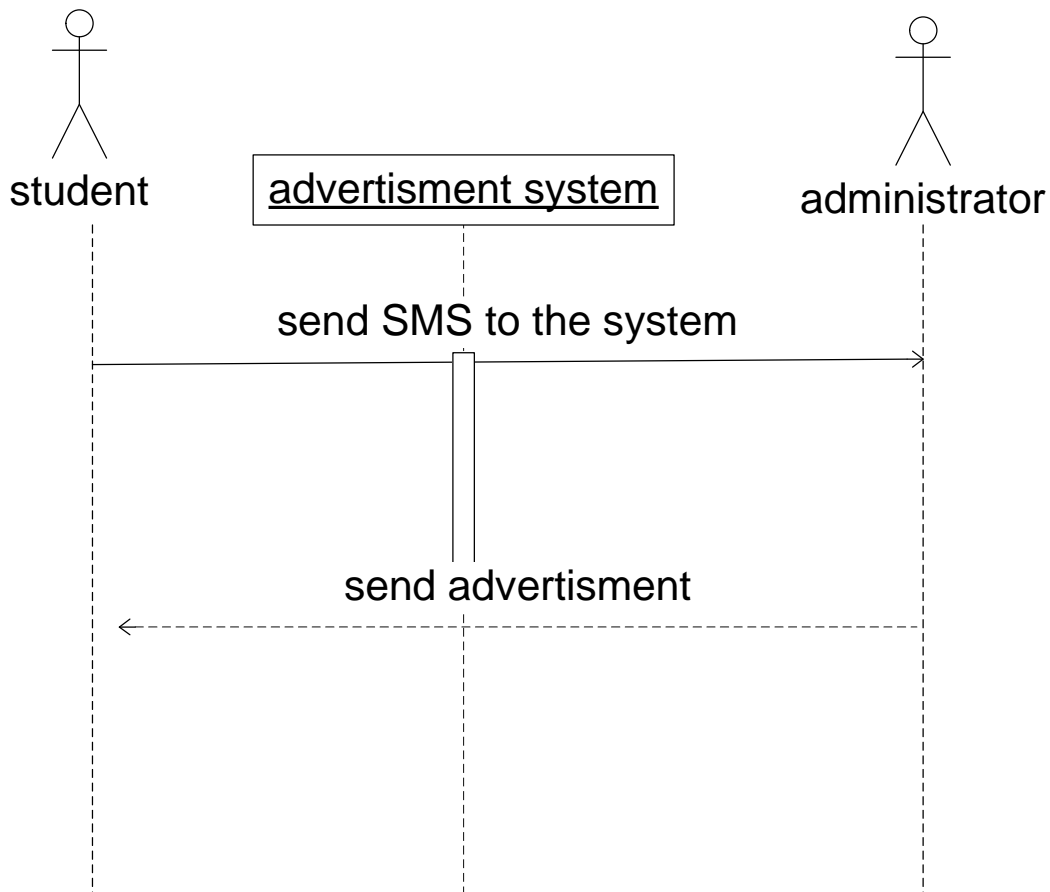


Figure (6.2): System Sequence Diagram

In figure 12 system sequence diagram , interactions occurs when student sends SMS to the system, then his phone number stored in the data base, then the admin responds by sending the announcement to the student phone number.



6.4 Class Diagram

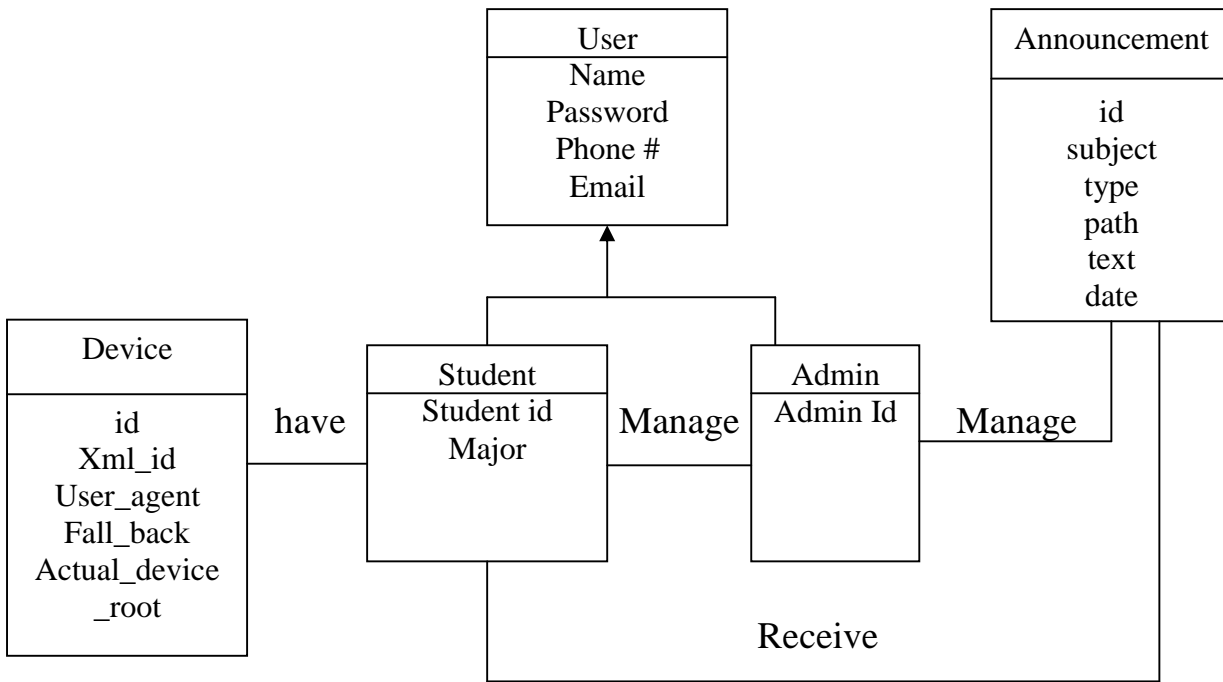


Figure (6.3) Class Diagram





## 7.1 Initiation

In this chapter we will discuss the system implementation, starting from system building and the installation of the required software, the development of our system requires a set of software and hardware to meet the predefined requirement found in a platform configured to be suitable for the deployment process.

Our system needs many software to be installed like Microsoft SQL server 2005, IIS, Microsoft windows XP, and also we need programs to design the system interface like Macromedia Flash MX, and Adobe Photoshop 8.0, we used programs to maintain and test connection between the computer and mobile such as Nokia PC suit and HyperTerminal. This chapter describes the installations of these programs and how they are prepared for work.

This chapter includes:

## 7.2 Establishment of the environment

The environment needed for our system involves different hardware and software as follows:

- Hardware needed for the system
  - 3 personal computers.
  - 3 flash memory 4GB.
  - Connection cable USB port.
  - Nokia 6100 mobile.
  - 1 printer.
- Software needed for our system

### 7.2.1 Microsoft Windows XP with IIS (Internet Information Service) web server

Because we use visual studio.net 2005 for programming, and this type of language depends on this operating system, and requires the installation of IIS.

#### **Follow these steps to install IIS:**

- Choose control panel.
- Select add/remove program.
- Choose add/remove windows component.



- Check on IIS option.
- Click on details option.
- Choose options.
- Insert Windows XP Professional CD.
- Click next.
- Click finish.

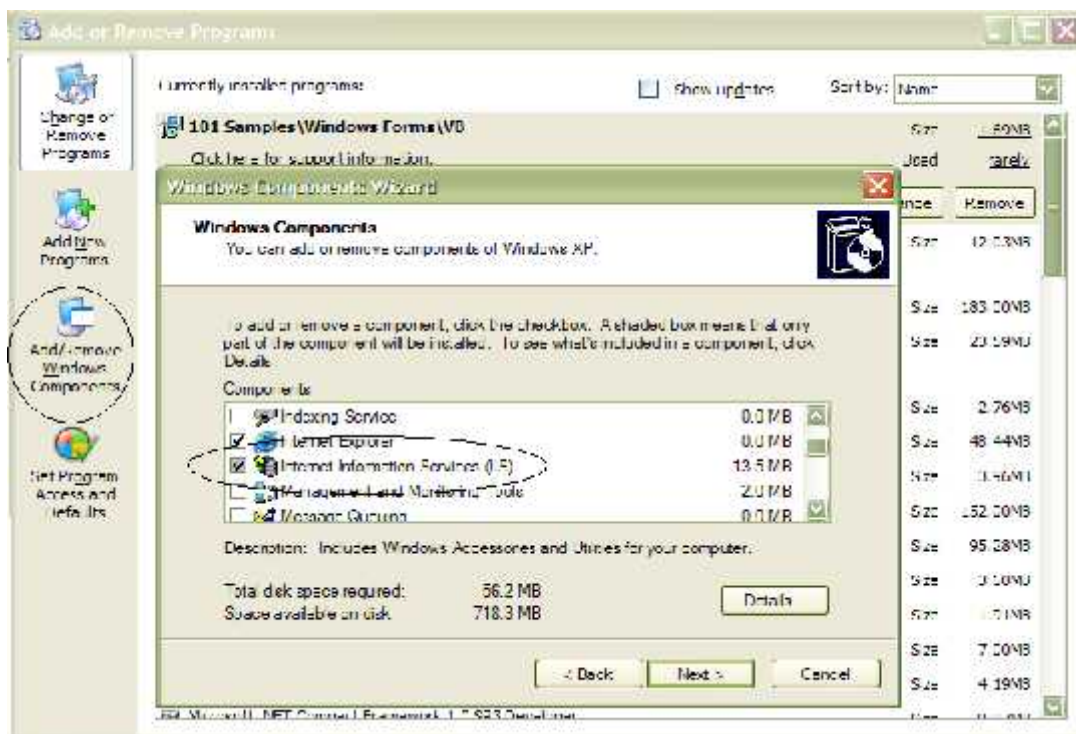


Figure (7.1): IIS (Internet Information Service) installation

### 7.2.2 Microsoft Visual Studio.net 2005

We use this software to develop our project website, because it's easy to use and compatible with database, it supports AT commands and also we can develop friendly interface.

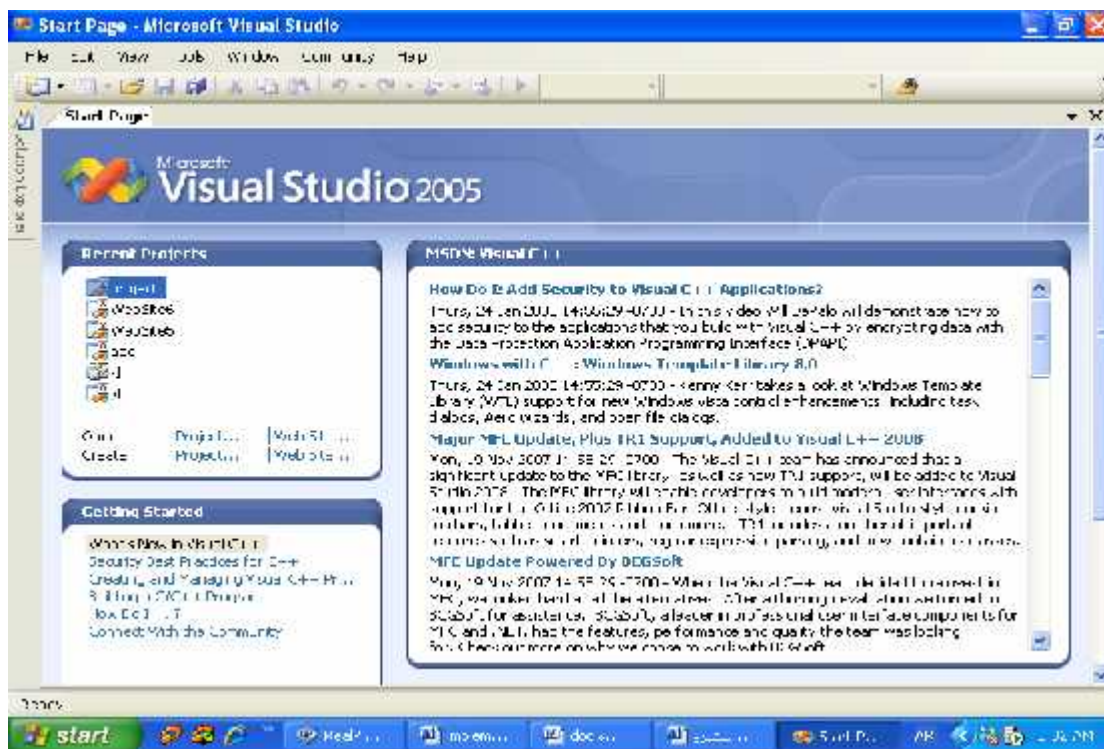


Figure (7.2): Create Web Application in Visual Studio.net 2005

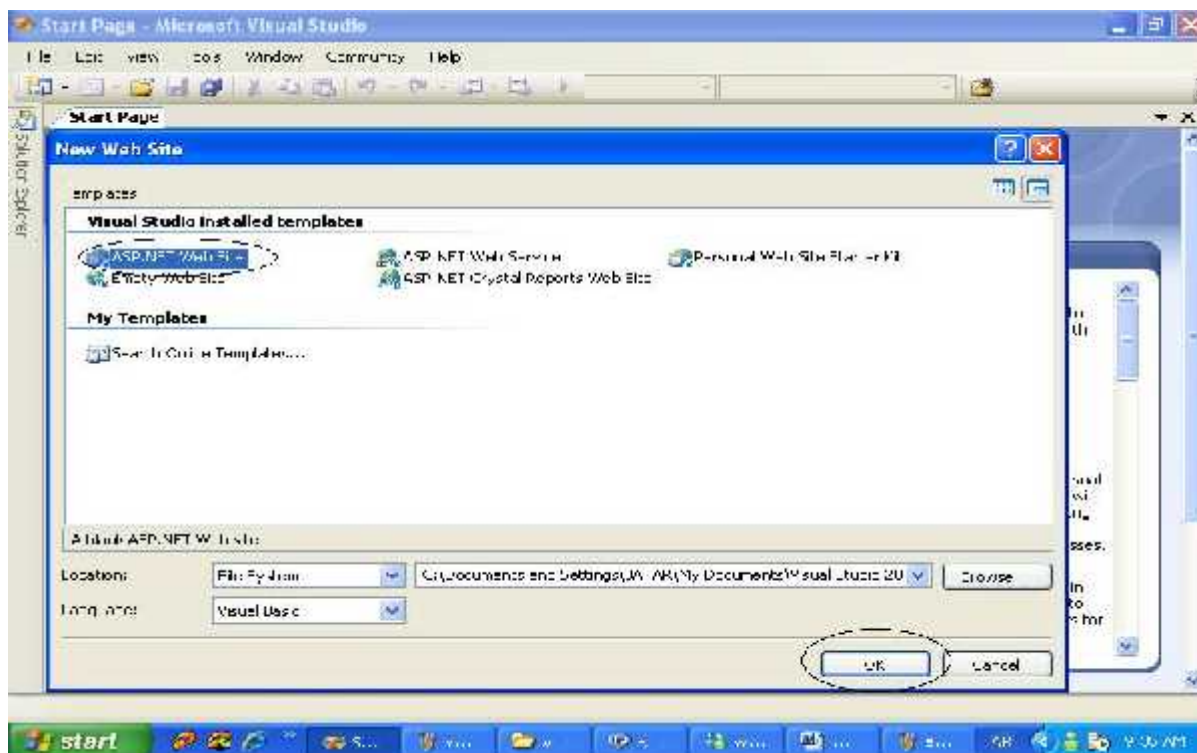


Figure (7.3): Create New Website



### 7.2.3 Microsoft SQL Server 2000

We use Microsoft SQL Server 2000 to create the database of our system, because it support high security, and compatible with Visual Studio.net 2005, and its easy to use and create connection between tables.

#### Configuration of Microsoft SQL Server 2000

Configure SQL Server 2000 to Windows only used when connecting application to SQL Server2000 Data Base Management System.



Figure (7.4): Configurations SQL Server



### 7.3 Other Software Supports our Project

- Adobe Photoshop.7 that we used to improve the interface of our project,
- Nokia PC suit for Nokia 6100 that used to make connection between the computer and the mobile
- Microsoft Visio that used to draw the flowcharts, data flow, context diagram.
- Macromedia flash that used to make advertisement with multimedia.
- Hyper terminal where is used to test if the intermediate mobile support AT Command or not.

### 7.4 Operating the system:

There are many steps should be taken before the system operates:

- Setting up the required programs needed to operate the system.
- Setting up the .NET framework.
- Creating the database connection.

To execute the system from the development environment we follow these steps:

- Go to start menu and select Microsoft Visual Studio.NET 2005.
- Then will appear two choices, open link of existing project or new link to create new project. Select open existing project.
- Then select project that name is "project".

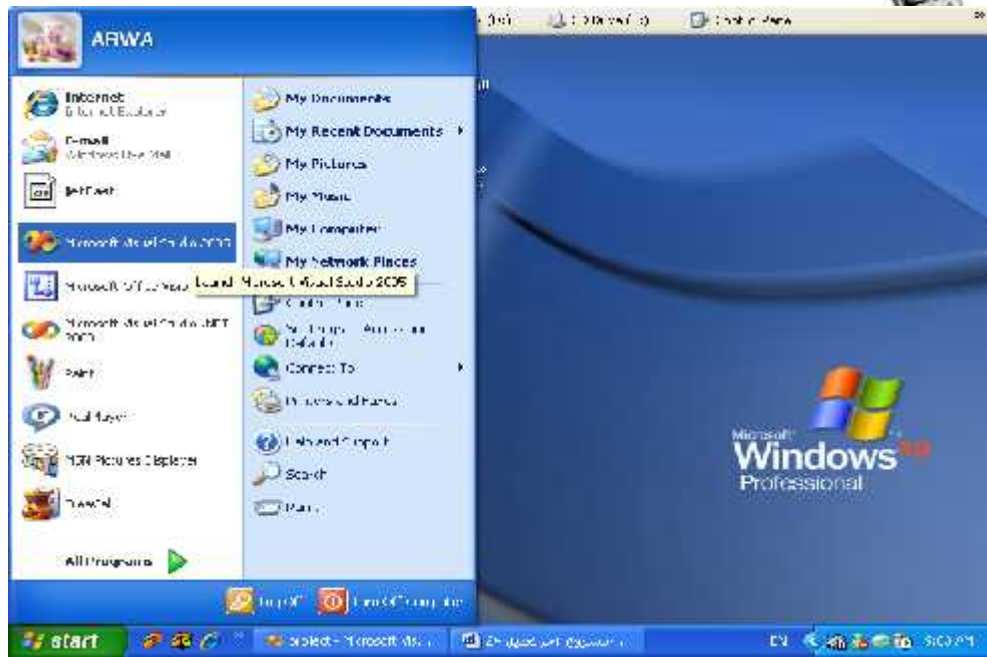


Figure (7.5): Select Microsoft Visual Studio.NET 2005



Figure (7.6): Select Open Project



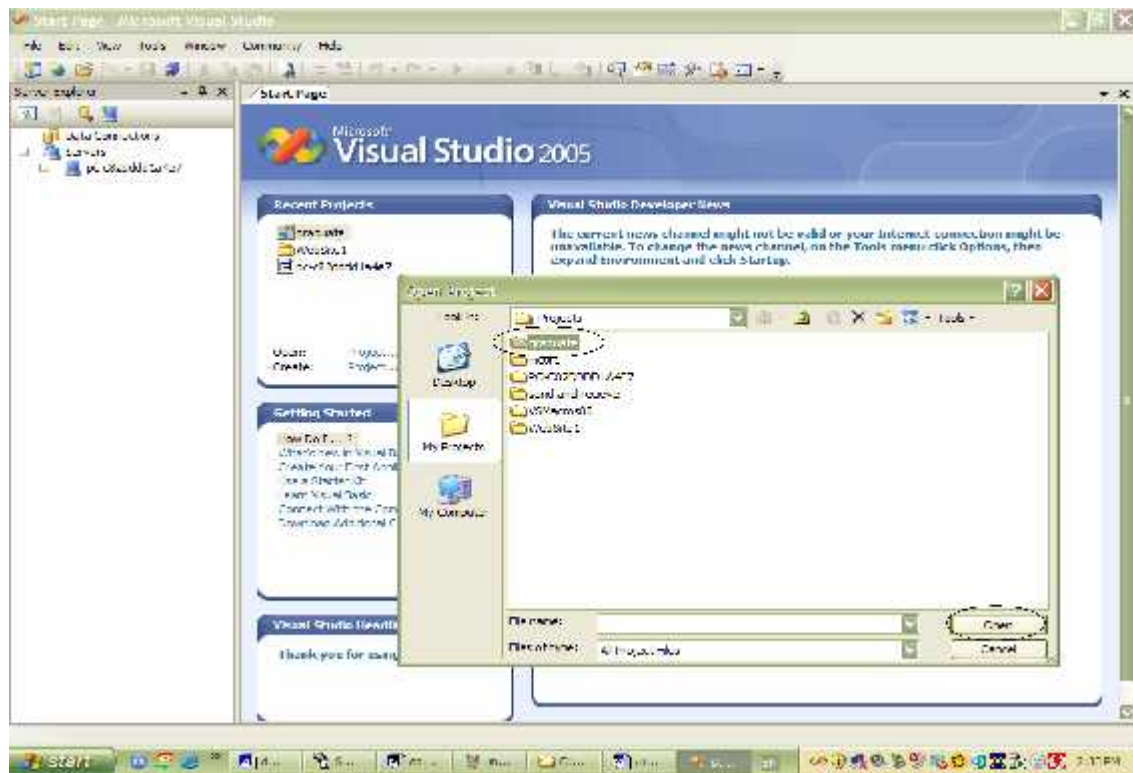


Figure (7.7): Select Project



## 8.1 Initiation

System testing is the most important step we must do before deliver the system ,to ensure it worked as we exactly expected , and to ensure that it meet all requirements that we specified before.

The testing process includes four levels

- System unit testing.
- Subsystems testing.
- Integration testing.
- WAP display testing

Testing process will take time as follow:

Table (8.1) Testing Schedule

Time in week \ Testing process	First week	Second week	Third week
unit testing			
Module testing			
Sub system testing			
Integration testing			
Acceptance testing			

## 8.2 System Unit Testing :

At this type of testing the system is divided into subsystems that each one of them will be tested separately to ensure that each one is meet its requirement, where it was testing process use white and black box testing to test the administrator log in and student changing his password.

First we will use valid inputs and another time we will use invalid inputs, and we will see the result at each time, as the below tables which explains the testing process for user log in and user changing his password:





Table (8.2) User Login Testing Unit

Unit testing process	Username	Password	Expected Result	Actual result
Valid username and password	05111	1234tf	User page load	User page load
Wrong expression for username or password	gggf	3325	Invalid inputs format	Invalid inputs format
Invalid username or password	11111	12345	Error message appear, username or password incorrect	Error message appear, username or password incorrect

Table (8.3) User Change Password Testing Unit

Unit testing process	Old password	New password	Confirm new password	Expected Result	Actual result
Valid old password, new password , and its confirm	1234tf	111111	111111	Password change successfully	Password change successfully
Wrong expression for old password or new password and confirm it	11346	22/3	22/3	Invalid inputs format	Invalid inputs format
Invalid old password	678976	111	111	invalid old password	invalid old password
Wrong in new password confirmation	268198	11134	112	Invalid confirm password	Invalid confirm password



### 8.3 Sub-System Testing:

At this type of testing our system has two subsystems as follows:

#### 1. Administrator Subsystem:

Here we tested the administrator functions that operate through the administrator page to ensure they meet their specification, and also we tested the interface how it appears and how the data layout.

#### 2. User Subsystem :

We tested the user functions that operate through the user page to ensure they meet their specification, and also we tested the interface how it appears and how the data layout.

### 8.4 Integration Testing:

At this testing type we tested all modules as a whole system to ensure that the system meets its requirements and operates as we expected.

### 8.5 WAP Display Testing :

This type of testing is done to make sure that WAP pages are displayed on all types of phones.

This test shows different appearances for the same page. A suitable format must be done to system pages to be compatible with different mobile devices related to their phone characteristics.

The system page, for example, in second-generation (2G) phones cannot display the image in some phones (for example, Motorola phones), so all information in the system should be introduced as text and image.



Figure (8.1) Phones Support Text Only.



Figure (8.2) Phones Support White and Black Colors Only



Figure (8.3) Phones Support Multimedia

### 8.6 Snapshots :

in this part we will take some snapshots from administrator and users forms.

1. Snapshots for system log in page .



Figure (8.4) System Login Page



2. Snapshots for invalid login.



Figure (8.5) Users Log in with Invalid Inputs.

3. Snapshots for user's registration on the system.



Figure (8.6) User Registration in the System



4. Snapshots for user registration validation

The screenshot shows the 'User Register' form in the 'University Announcement System'. The form fields are filled with the following data:

User ID	11	User Name	saam
Phone #	065963900	Group Type	students
Email	saam_11@gnicmail.com	Contact Email	saam_11@hotmail.com
Password		Confirm Password	
Secret Question	your favourite animal?	Secret Answer	lion

Below the form, there is a CAPTCHA image showing the number '049538'. A 'Submit' button is present. A red error message states: 'This user is exist choose another user to login.'

Figure (8.7) User Register with Username already exist.

5. snapshots for user complete registration in the system .

The screenshot shows the 'User Register' form in the 'University Announcement System' after successful registration. The form fields are filled with the following data:

User ID	254967	User Name	saam
Phone #	065963900	Group Type	students
Email	saam_11@gnicmail.com	Contact Email	saam_11@hotmail.com
Password		Confirm Password	
Secret Question	your favourite animal?	Secret Answer	lion

Below the form, there is a CAPTCHA image showing the number '049538'. A 'Submit' button is present. A red success message states: 'Will receive a letter shortly after the email to the Registrar, please click on the link to complete your registration.'

Figure (8.8) User Complete Registration in System.





6. snapshots for lost user password .



Figure ( 8.9) User Request his secret question to Recover his Password .

7. Snapshots for recover user his password.

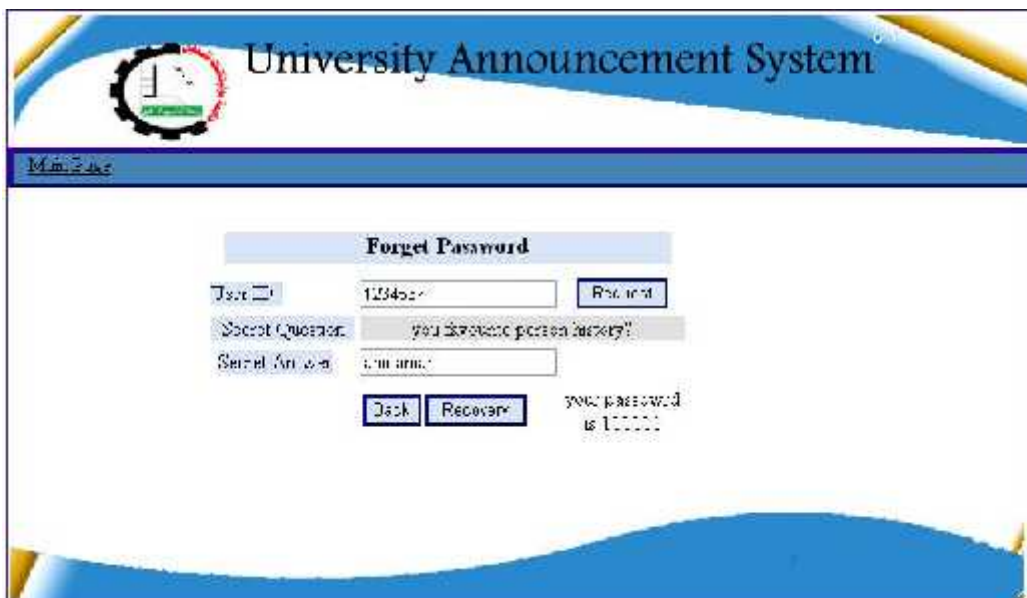


Figure (8.10) User Recover Password Complete.



## 9.1 Initiation:

In this chapter we will discuss how to start work with the system, and establish the environment that the system works in it, and how our university will apply this project.

We describe in this chapter:

- Maintenance plan.
- Migration.

And we will take about system maintenance which includes:

- Mobile maintenance.
- SQL Server 2000 maintenance.
- The .Net frame work maintenance.
- Nokia PC suite maintenance.

## 9.2 Maintenance Plan.

When we build our system we take care of all possibilities that may make our system failing, and all errors expected we tried to solve it.

In this section we describe maintenance plan to our system:

- Backup:

Database is the most important part in our project; it includes the tables that our system builds at, so we should take care of these tables, by taking backup of these tables periodically.



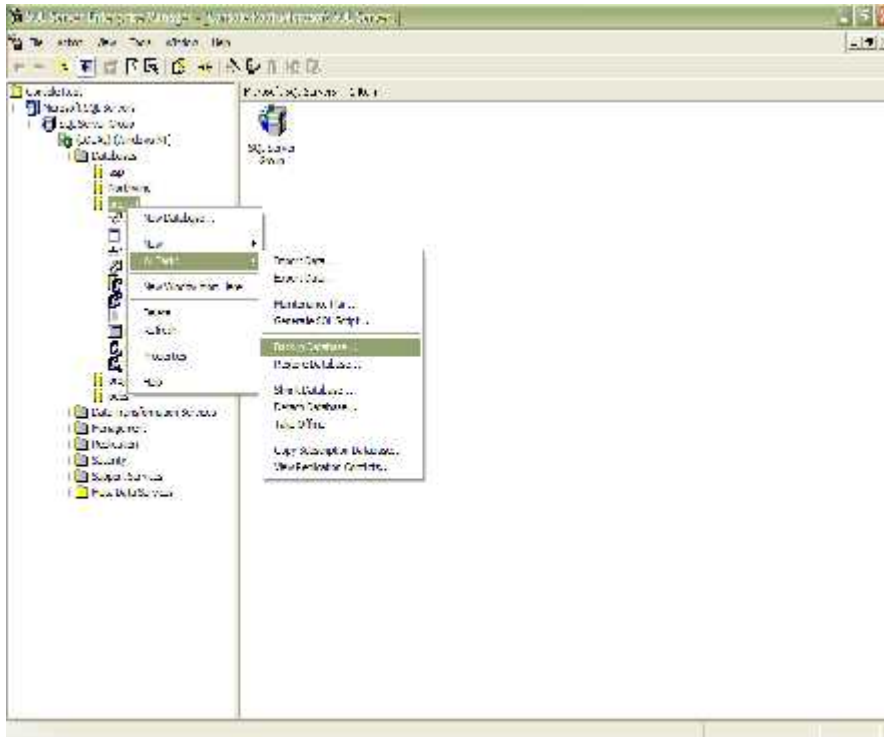


Figure (9.1): Data Base Backup

- Upgrade system:

We upgrade our system by getting newer copies of software used, such as SQL Server 2005, and so improving the performance of the system.

### 9.3 Migrations:

The deployment of the system must be developed in certain steps, to work effectively and efficiently with the environment, so the system environment should be established correctly.

Migration goes through these steps:

- Establishment of the production environment.

The minimal requirement needed to deploy the system are described in system specification (chapter 3), and coding and implementation (chapter6).

For example our system will not operate without Visual Studio.net 2005.

- Deploying the new system.

Decision must be taken to deploy the new system taken by the management that decided to work on our system, after answering these questions:



- Does our system cover the functional requirements of the university announcements?
- Does the university have the minimal requirements to operate the new system?
- What are steps that should follow to operate the system?
  
- Running the system:

After the system complete it should run.

#### 9.4 Mobile Maintenance

Mobiles must be checked if it contains battery and credit periodically, because users can't send SMS to the server to request advertisement if his mobile not contains credit or battery.

#### 9.5 SQL Server 2000 Maintenance

Data base is the most important part in the system

#### 9.6 The .Net Framework Maintenance

Since .net framework is the infrastructure of the Microsoft .net technology, we can through vs.net 2005 make any changes and update any forms in the system.



## 10.1 Conclusion

- As a conclusion we can say that our system can provide the university with SMS/MMS announcements that save times and efforts of both students and teachers.
- Our system provides adaptability to all kinds of mobile devices.

## 10.2 Recommendations:

- The team recommends to the university to apply our project to send announcements to students as SMS/MMS.
- The team recommends to using GSM modem instead of cable connection between the computer and mobile.
- The team recommends developing our system to have the ability to decide the student position at the university, or to know the teacher office location when the student sends SMS to the server by drawing a map that describe the needed location .

## 10.3 Future works:

We used WURFL in our project to identify the user device profile, but the team members encourage as future work to use UAPROF to identify the user device profile. It is a specific CC/PP dictionary describing mobile devices and defining an effective way for CC/PP content transition via wireless nets. Mobile phones conformed to UAPROF specification provide CC/PP description of their characteristics on a server. Content servers, gateways and proxy servers can use this information and optimize the content for the device of a consumer. The information is in XML format. When a mobile device sends request to server, it also sends an URL



address to its mobile profile. This is carried out by adding of X-Wap-Profile Header to the request. This header indicates the server where to find the device profile.



References:

There is many websites help us in our project.

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