Design & Implementation Of A Package For Internet Café Management

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Received on: 4/9/2004
Accepted on: 14/3/2005

Abstract

The increasing demand on the internet leads to the spread of internet cafes. As internet cafes become large and consist of many computers that it is difficult for the manager of the café to keep track of which computer is busy and which is free so the a user can use it. Also there is a problem of security that an intruder can enter the café use a free computer and get out without the manager notice. One more important thing is accounting, the manager must keep track of the starting time and ending time of each user so the user can be billed according to minute cost known to the user and the manager.

The Package Goals:

1- Provide information to the manager about computer state (free, busy, and not connected).

2- provide two internet services to the user(prepaid) and(play and pay),
   Prepaid: the users subscribe by an amount of money and get an amount of time and identification information (User Name and Password). User accounts are entered in a table so it can be used for making reports. Each time the user wants to use the service the user enters user the name and password and login. The software starts a timer for the user shows how much time left for the user according to his subscription. Play and pay: the user ask the manager to use a free computer, the Manager opens the computer from the server computer. The software record the starting time and starts timers to show the duration since the user has used the service so the user can be billed. Billing information is entered in table so it can b used for making reports.

3- Locking all the computers so an intruder cannot use any computer unless he asked the manager to open a computer or entered a legitimate user name and password.

4- Provide reports to the manager about user accounts and play and pay billing information by entering start date and end date. And the ability to manage the database containing the tables.

5- Provide ability to manage user accounts such as add new member, delete member and edit member.

6- Allow the manger to control all the computers in the café, so it can open, close,restart,shut down, disconnect or shut down all computers by a single click.

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تصميم وتنفيذ حقيبة لأدارة مقهى أنترنيت

الخلاصة

ادى الطلب المتزايد على الأنترنيت الى أنتشار مقاهي الأنترنيت حيث اصبحت كبيـرة وتشـمل العديـد مـن الحاسبات والتي من الصعب على مدير المقهى متابعة كل الحاسبات(مشغولة، غير مشـغولة) لـيمكن للمسـتخدم استعمالها وهناك ايضا مشكلة الامنية اذ يمكن لأي دخيل استخدام الحاسبة بدون ملاحظة المدير، والجانب الآخـر والمهم جدا هو ا لحسابات حيث على مدير المقهى متابعة وقت بداية ونهاية اسـتعمال الحاسـبة لكـل مسـتعمل لمحاسبته على كلفة الدقيقة المعروفة.

اهداف البحث:-

١ - تزويد المعلومات الى مدير المقهى حول حالة الحاسبات(مشغول، مطلق،غير مربوط).

٢ - تزويد خدمة الأنترنيت للمستعمل بنوعين : المدفوع مسبقا، وأستخدم وأدفع.

المدفوع مسبقا: يشترك المستعملون بكمية من المال للحصول على زمن معين للعمل باستخدام أسم المسـتعمل وكلمة السر، يخزن الحساب في جدول ليستخدم في التقريرو يمكن للمستعمل العمل على هذه الخدمة في أي وقت.

أستخدم وأدفع: يطلب المستعمل من المدير استعمال الحاسبة المطلقة حيث تفتح الحاسبة من قبل المدير مـن حاسوب المخدم، يقوم البرنامج بتسجيل وقت البداية ويبدأ الموقت بالعمل لتحديد مدة العمل ، تحفـظ المعلومـات لعمل التقارير.

٣ - اغلاق جميع الحاسبات لذلك لا يمكن لأي دخيل استعمالها دون الطلب من المدير او ادخال الاسم وكلمة السر.

٤ - تزويد التقارير للمدير حول حسابات المستعملين ومحاسبتهم بادخال تاريخ بداية ونهاية العمل ، والقدرة علـى أدارة قاعدة البيانات.

٥ - أضافة مستعمل جديد ، حذف او تعديل مستعمل.

٦ - يسمح لمدير المقهى بالسيطرة على حاسبات المقهى فتح ، غلق ، استأنف ،فصل او غلق كل الحاسبات.

1 Introduction

The internet has revolutionized the computer and communication world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

The internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure. Beginning with the early research in packet switching, the government, industry and academia have been partners in evolving and deploying this exciting new technology today, terms like bleiner@computer.org and http://www.acm.org trip lightly off the tongue of the random person on the street [7].

This is intended to be a brief, necessarily cursory and incomplete history. Much material currently exists about the internet, covering history, technology, and usage. a trip to almost any bookstore will find shelves of material written about internet.

Several of us involved in the development and evolution of the internet share our views of its origins and history. This history revolves around four distinct aspects. There is the technological evolution that began with early research on packet switching and the ARPANET (and related technologies), and where current research continues to expand the horizons of the infrastructure along several dimensions, such as scale, performance, and higher-level functionality. There is the

operations and management aspect of a global and complex operational infrastructure. There is the social aspect, which resulted in a broad community of internets working together to create and evolve the technology. And there is the commercialization aspect, resulting in an extremely effective transition of research results into a broadly deployed and available information infrastructure.[4]

The internet today is a widespread information infrastructure; the initial prototype of what is often called the national (or Global or Galactic) information infrastructure .its history is complex and involves many aspects technological, organization, and community. and its influence reaches not only to the technical fields of computer communications but throughout society as we move toward increasing use of online tools to accomplish electronic commerce, information acquisition , and community operation.[3]

2 Software Process Model
There are many types of the software process models used in software engineering; they are[6]:
1- The linear sequential model.
2- Prototyping model.
3- Evolutionary model.
4- The formal method model.
5- Spiral model.

In our project we used the linear sequential model, this model some times called "classic life cycle" or the "waterfall model". This model divides the life cycle of a software development process into the phases shown in the figure-1-. [6]

This model is named "waterfall model" because its diagrammatic nature representation resembles a cascade of waterfalls. These different phases of this model are as shown in the figure.

This model is named "waterfall model" because it's diagrammatic nature representation resembles a cascade of waterfalls. These different phases of this model are as shown in the figure. The different phases starting from the feasibility study to the integration of system testing are known as the (development phases). During each cycle asset of well-defined activities are carried out. Each phase typically requires relatively different amounts of effort necessary for each phase for a typical product is shown in figure-2- [6].

Note that among all the life cycle phases the maintenance phase typically requites the maximum effort. In this model, each phase of the life cycle has a well-defined starting ending point. The next phase, the linear sequential mode is the oldest and the most widely used paradigm for software engineering. The problem with this model is its inflexible partitioning of the project into these distinct stages.

3 Project Basic Operations
The basic operation of the software project depends on sending massages between the server machine and clients. This requires network programming, visual basic provide a control called the Winsock control, invisible to the user, provides easy access to YCP and UDP network services. It can be used to write client or server applications. By setting properties and invoking methods of the control, you can easily connect to a remote machine and exchange data in both directions. By sending message from the server machine to the client machine containing an order such as "open" or "close" the client machine responds to the order by calling the dedicated subroutine. flow-1-

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4 Synchronization of All Computers on the Network

One question is how all clients' computers know which computer is the server, this can be easily done by giving the name of the IP address of the server computer to all client computer, but if the server computer wants to change its name or IP address all client computer will not be able to connect to it! To solve the problem once the server application is loaded on the server computer it broadcast to all computers on the net its IP address using UDP packet to the port dedicated for client computers. Then it listens for lately computer which didn't get the IP address, by listing on a port dedicated for the server computer. On the other side once a client application is loaded on a client computer it broadcast a UDP packet on the port dedicated to the server computer asking for server's IP address. If no response this means that the server application is not loaded on the server computer so the client computers just listen to the port dedicated to client computers and wait for the server computer to load the server application and broadcast its IP address. One more important thing is that the server applications consist of one static UDP Winsock control and a dynamic TCP Winsock control. The UDP socket is used to broadcast the server address over the net, while the TCP control is created for each client computer requesting connection. That is mean; the server application will be able to handle any number of client computers. Once a new computer is added to the net and the client application is loaded on the client computer the server application will detect the client computer and display an icon for it showing its state.

5 Managing Client Computers

After connection is made between the server computer and the client computer the server application will create an icon for each client computer that is connected display computer state the server. The icon(free, busy, disconnected) as in figure-3-.

5.1 Manager's Action

The manager of the café can open, close, disconnect. Restart or even shutdown any client computer by right click on the computer icon and choosing the appropriate action or select the computer icon and the form the computer menu choose the appropriate action as shown in figure-4-. After choosing the required action the server computer sends a message to client computer containing the required action. The client computer responds to the server command by calling the appropriate subroutine. If the manager wants to close the café, he can just select shutdown all computers and all computer will power off. Because the server computer will enter a loop and send a message to every connected computer containing the command "shutdown". Then the client computers will respond to the command and power off. While the client application at the start will block the screen and request user name and password or the client will not be able to use the computer unless the manager opens the computer from the server application. The client application is shown in figure-5-

If the manager wants to open a computer for a client, he selects the computer icon and then clicks on open from the computer menu or by right click on computer icon and then choosing the send a message to the client computer telling it to close the block screen and display the (play and

pay) bar and also the server computer sends the unit cost per minute. The open action will cause the client computer to start a (play and pay) session. A bar is displayed at the bottom of the client computer screen showing the duration of using the computer and the cost for that duration. The bar is shown in figure-6-.

5.2 Computing Cost

the client application starts a timer and the information of the play and pay bay is update every minute, the time is increased by one minute, and the costs increased by the unit cost. So the client can know how long he used the computer and what is the cost. The server application also records the start time of the user and starts a timer for him. So the cost can be computed by increasing it every minute by the unit cost and the duration is increased by one minute. This information is used to bill the user when he wants to end the play and pay session, the manager selects the required computer and then selects the bill item from the computer menu for the pop up computer menu by right click on the computer icon. The bill form is displayed and is shown in figure-7-. The bill form show the number of computer, start time, end time, duration, cost, and if the manager wants to make discount for the user, the manager enter the percentage discount value in the discount field and the cost after discount is computed automatically in the result field.

5.3 Client Subscription

if the client has subscription, he will enter his user name and password and press login. The client computer will send the user name and password to the server computer. The server computer will search the database for that user name. If user name was found, the server computer

checks to see whether the given password is the same as that in the database for the found user name. if it is, the server computer checks if this member is currently logged or not. If this member is currently logging, the server computer will deny the permission to login because allowing two or more users to login using the same subscription will cause accounting problems. If the member is not currently logging the server computer will send a message to client computer ordering it to start a (prepaid) session. When the session is started, a bar is displayed at the bottom of the client computer screen showing the duration of using the client according to his subscription. The bar is shown in figure-8.

5.4 Prepaid Action

The bill item is not available for prepaid service, so it is disabled. But manager can always see detail of any client computer (prepaid or play and pay) by selecting the information item from the computer menu. A form is displayed as shown in figure-9-. The form show the computer number, start time, duration until current time, and the cost for that duration if the computer is on play and pay session or the time left for that user if the computer is on prepaid session.

5.5 Disconnect Action

Disconnects the client computer for the server computer and the client application is ended. A disconnected client computer cannot be controlled from the server computer. The shutdown item power off the client computer and the restart item reboots the client computer. The shutdown all computers item turn off all computers connected to the server computer.

6 The Database

the server application contains a database that record members (username,password,prepaid,remained time),unit cost, plays and pay table(date, start time, end time, duration, cost, discount, cost after discount) and prepaid table(date, subscript time, payment) flow-2-.

The manager can access the database from the database menu. The database menu is shown in figure-10-. We will come to each item in the database menu in detail.

6.1 Unit Cost

The unit cost is the unit defines the cost of using the client computer per minute for play and pay service. When a play and pay session begin a cost field is shown in the bar at the bottom of the screen. The cost is increased every minute by the unit cost. The unit cost is saved in the database and loaded at the start of the application. All changes to the unit cost will take effect the next time the application is loaded. The manager of the café can enter either the unit cost per minute or per hours. To change the minute cost, from the database menu choose unit cost. After that the unit cost form appears. The unit cost form is shown in figure-11-.

When the manager of the café enters unit cost per minute the unit cost per hour is automatically computed, and when the manager enters unit cost per hour also unit cost per minute is automatically computed. This way the manager has a good appearance of the unit cost.

When the manager presses (o.k.) button a message box appear to remind the manager that the effect next time the application is started as shown in figure-12-.

6.2 Members

Members are the second items in database menu. The members' item allows the

manager to add , delete, edit, or find a member in the database .the members' form is shown in figure-13-.to find a member, the manager enters the user name in the user name field the he press the find button. If the manager wants to edit the profile of an existing member, the manager selects the member then by pressing the edit button the member's profile is opened in the edit member form as shown in figure-14-

The manager can change the user name. password and the remained time. After completing all change the manager click on the "(o.k.) button for the changes to take effect, or by clicking on cancel button all changes will be discard.

To add a member, the manager clicks on the add member button and the add member form displayed. The add member form is shown in figure-15-.

The manager fills the information an a correct manner and then clicks on the (o.k.) button for changes to take effect. If any field is empty or contains invalid information such as invalid time, the application displays a message box asking the user to enter valid information. The message box is shown in figure-16-.after entering the valid information the application will search for the entered user name to make sure that each user name should be unique. If the entered user name is already used the application will display a massage box that ask the manager to enter a different user name because the entered user name is already used. The massage box is shown in figure-17-. If all information are correct and the entered user name is not used, a member is added and these information are entered into the prepaid table for later use. To delete a member the manager selects a member by clicking on it, and then clicks on the delete button.

6.3 Management

The third item in the database menu is the manage sub menu which consist of two facilities to manage the database, one for the prepaid table and the other for the play and pay table. The manage sub menu is shown in figure-17-.

6.3.1 Prepaid Management

By selecting the prepaid item in the manage sub menu the prepaid management form is displayed. The prepaid management form is displayed. The prepaid management form is shown in figure-18-.the form shows the date of the subscription, the duration of the subscription, the user name and the payment. The manager can delete a single record, records before a given date, records between two given dates, or delete all records. These options allow the manager to eliminate all unneeded records so they are not displayed in the report. We will come to the report later. The manager selects the type of deletion, and then if the type requires a date(s) to be entered the manager must enter the required date(s) and then clicks on the delete button. If the manager enters an invalid date the application display a message box to inform the manager.

6.3.2 Play and Pay Management

it is the second item in the manage sub menu . Clicking on this item the play and pay display management form as shown in figure-18-. The form shows the date of using the client computer, computer number, and start time of using the computer, end time, duration between the start and the end, unit cost at that time per minute, total cost for using the computer, discount, and cost after discount. As in the prepaid management form, the play and pay management form allow the manager to delete unneeded records. The manager selects the type of deletion and enters the

date(s) if required the he clicks on the delete button.

6.4 Reports

The server application provides useful information to the manager about the café through reports. Reports are the last sub menu in the database menu.

As in the manage sub menu the report sub menu has two items prepaid and play and pay. The prepaid item provides reports about the prepaid service while the play and pay item provide report about the play and pay service. By selecting any item of them a form is displayed to enter the date or the duration between two dates that the manager wants to view report about it. If the manager enters only one date the date is checked to be valid and if it is, the report is displayed for only that date, but if the manager enters two dates, the dates are checked to be valid form; if they are valid the report is displayed for the duration of that two dates. If the entered date(s) are not valid and if the start date is larger than the end date, the massage box is displayed telling the manager about error as shown in figure -22-a,-22-b-.

6.4.1 Prepaid Report

The prepaid report shows the date of each account, the user name assigned to that account, the time that the user has subscribed for it and the payment. at the bottom there is a summary for total payment, total subscribed time, total number of subscribed for the given date or for the duration between two dates, the prepaid report is shown in figure-23-

6.4.2 Play and pay report

it shows the date of using the computer, computer number, start time, end time, duration, discount, cost after discount. At the bottom, a summary is displayed of total cost, total time, and number of users as shown in figure -24-.

7 Conclusions

With the rapid growth of the internet, network management is a more demanding domain, and as internet café's become large and consist of many computer, therefore our work developed to automate and simplify the work and management of the internet café and help the manager to keep track of all actions in the café without any hard effort, and provides useful information daily, monthly and on demand to the manager by rich reports. The package is very easy to use without the needing to user menu.

Reference

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Software Flowcharts
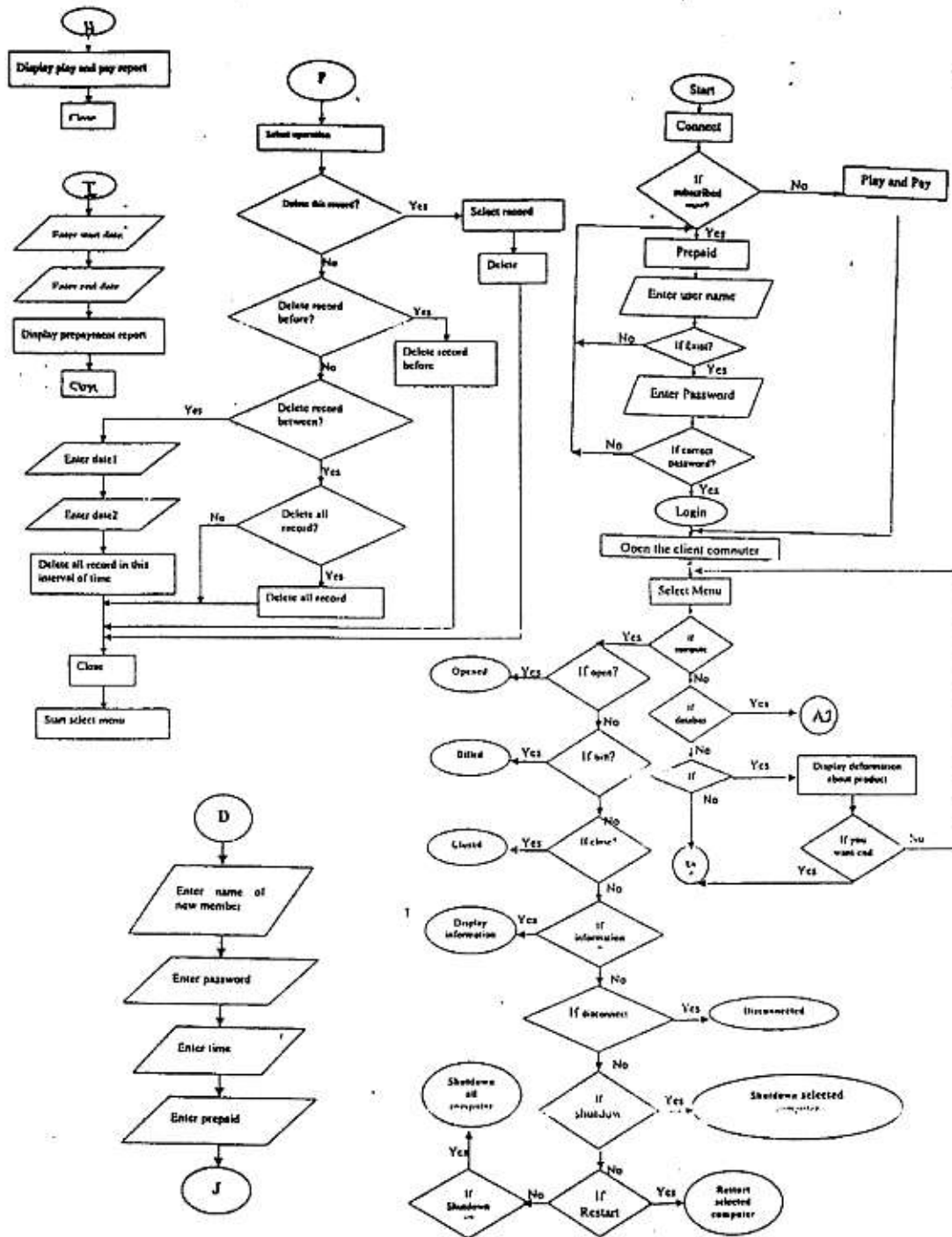
Flow-1- Package Basic Operation
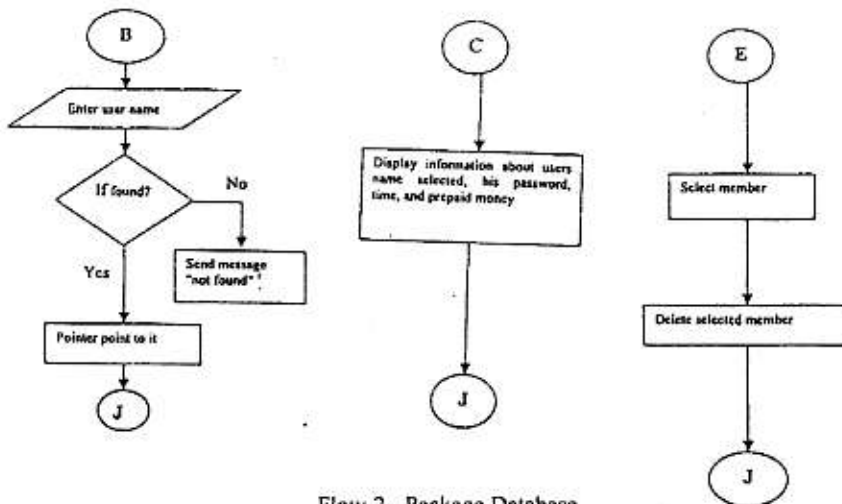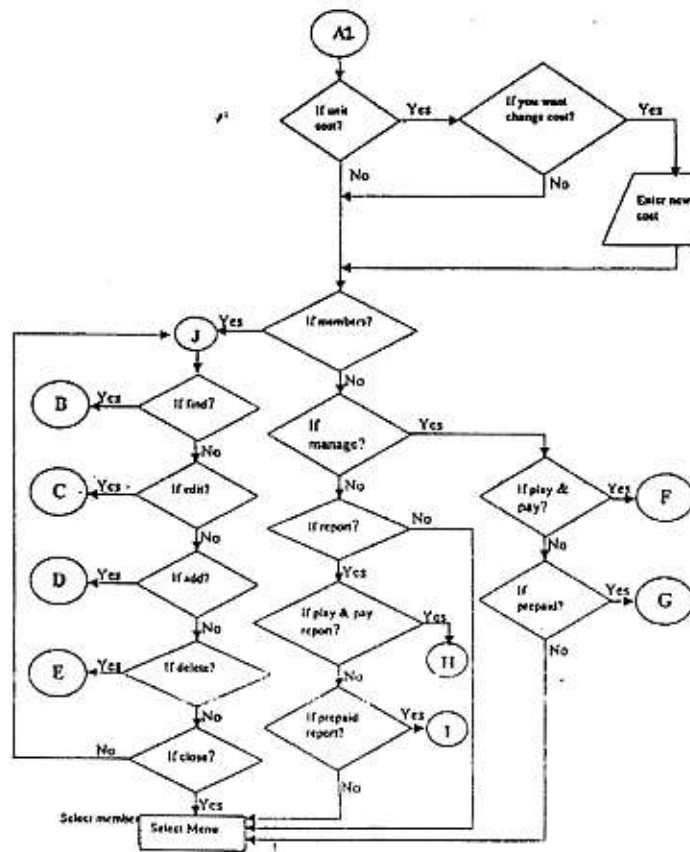
Flow-2- Package Database
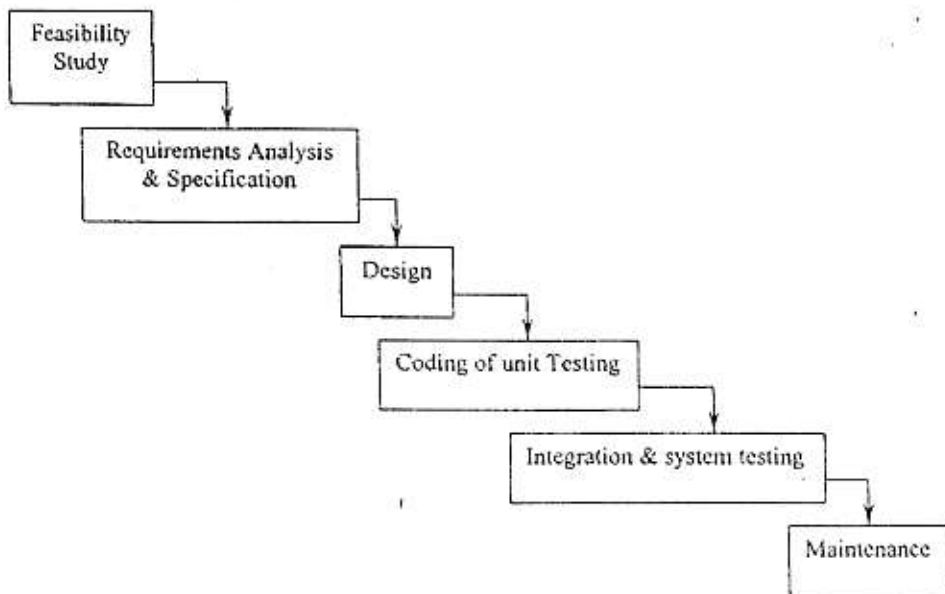
Figure-1- Software development Life Cycle
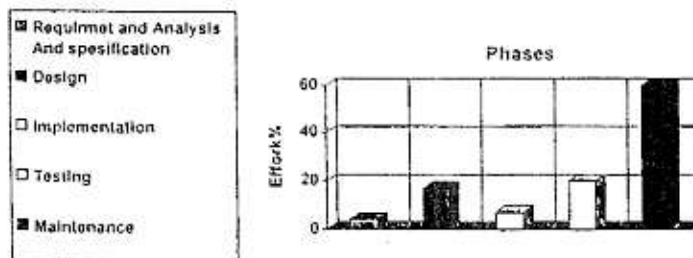
Figure-2- Software Effort Distribution

Figure-3- The Server Application
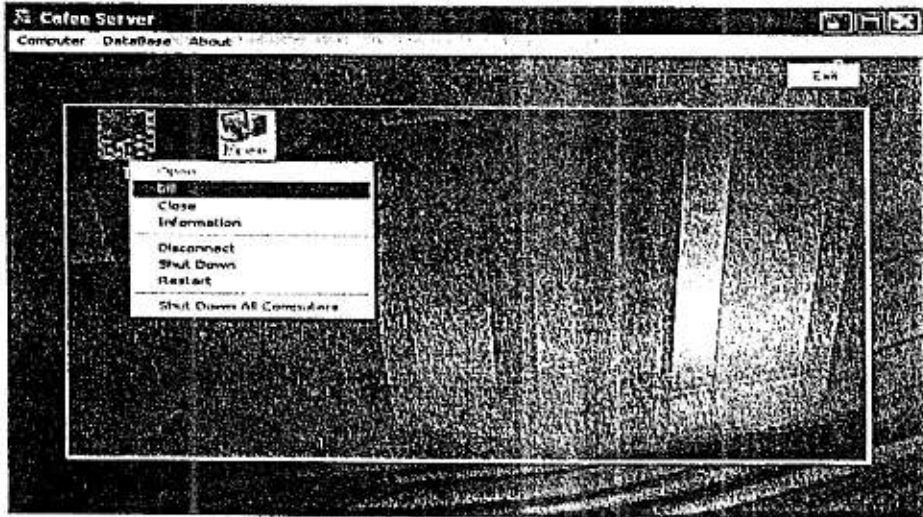
Figure-4- Managing client computers

Cost: 140   Duration: 00:07
Figure –5-The Play and Pay bar
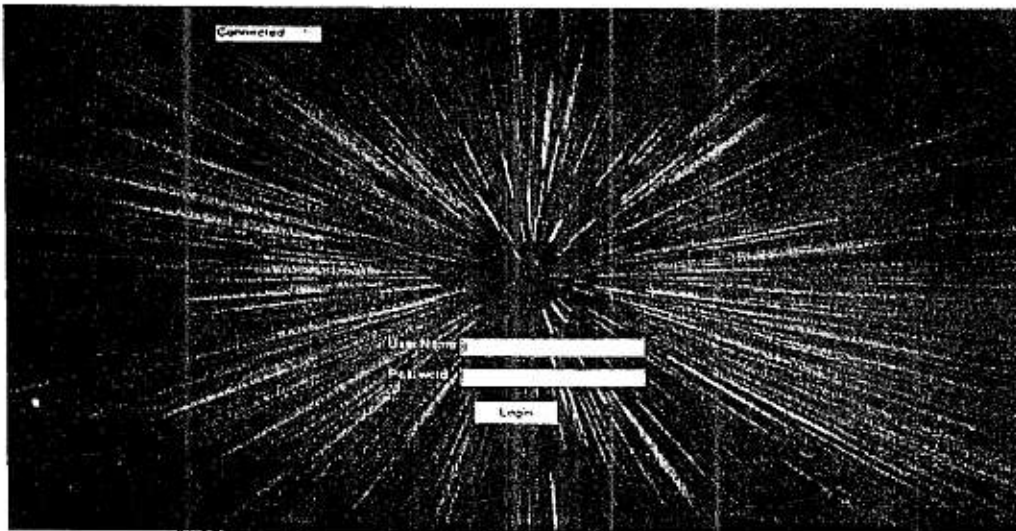
Figure –6-The Client Application

Figure –7- The Bill form

Time Left: 09:56   **Duration: 00:01**

Figure-8- The Prepaid bar

Figure -9-a- Computer information form (prepaid)

Figure –9-b- Computer information form (Play and Pay)

Figure –10- The database menu
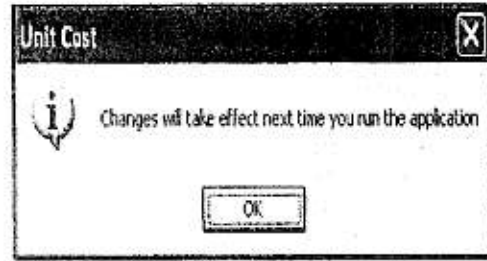
Figure-11-
The unit cost notification message box
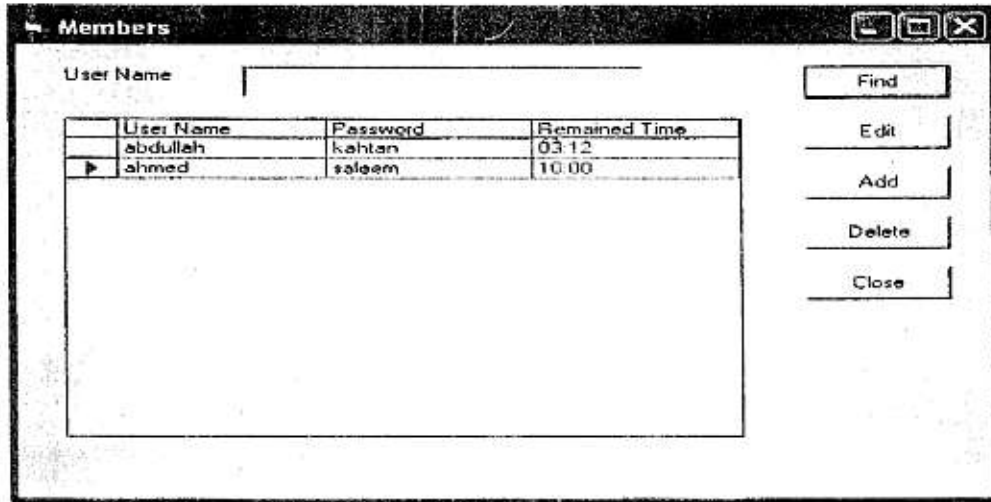
Figure-12-
The unit cost form
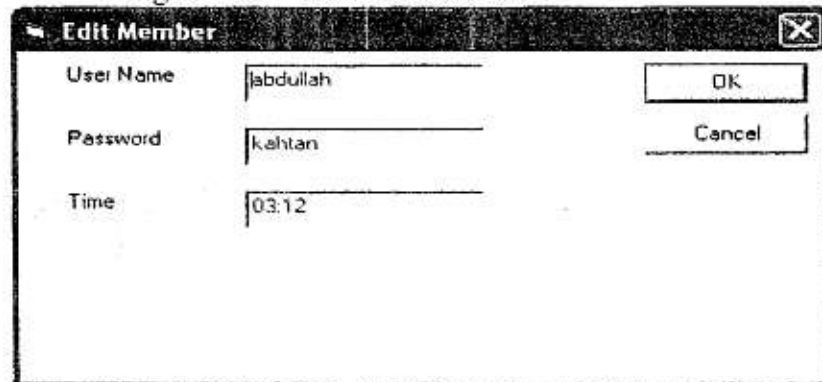
Figure -13-   The member's form
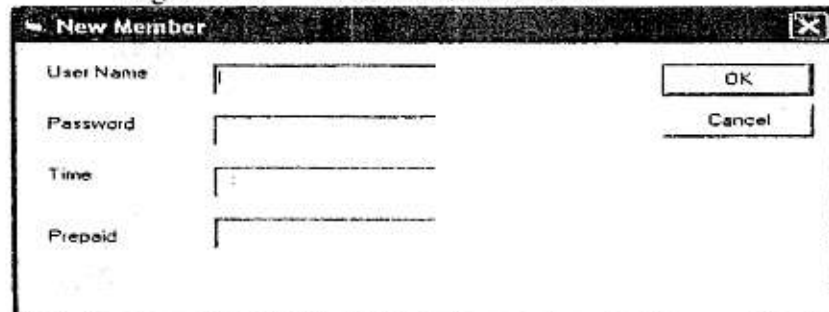
Figure –14–   The edit member form

Figure –15–   The new member form
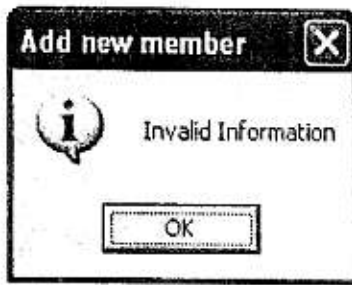
Figure-16-

The duplicate user name message box
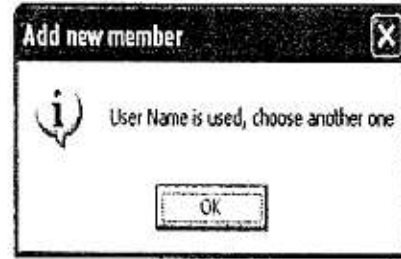
Figure-17-

The invalid information message box

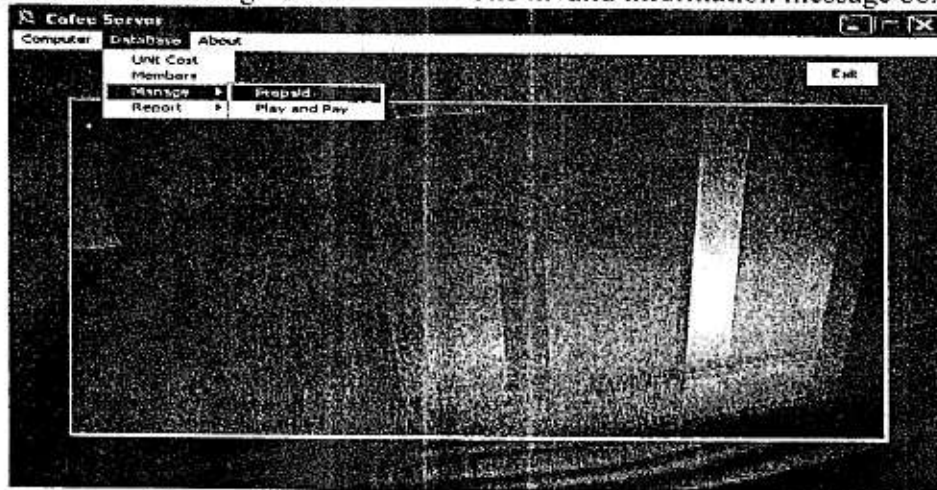Figure -18-   The Manage sub menu

Figure –19-   The Prepaid Management form
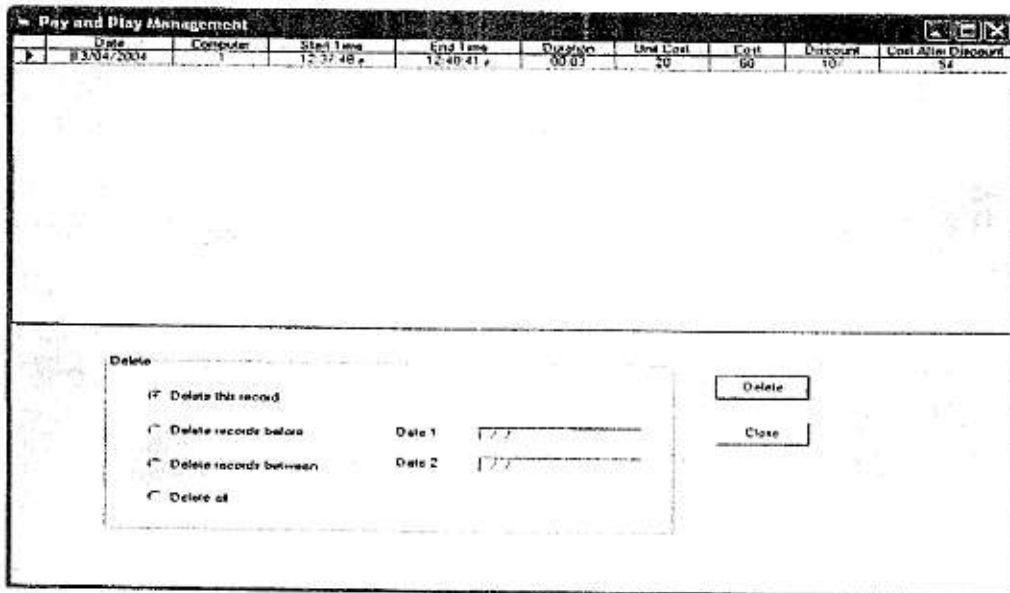
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Figure-20 -   The Play and Pay management form

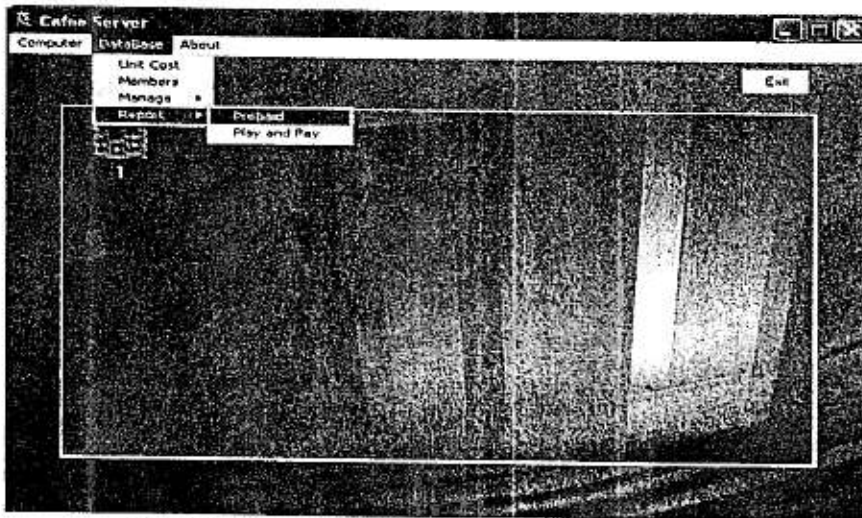Figure –21-   The Report sub menu
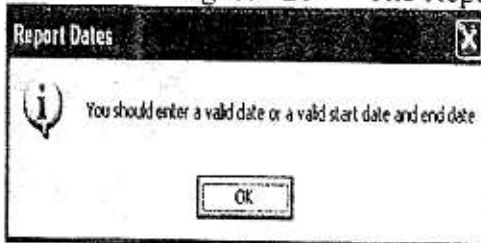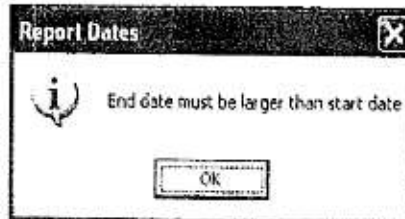

Figure –22-a
The invalid date(s) message box

Figure-22-b
The invalid dates message box

Prepaymet Report

	Date	User Name	Time	Payment
	05/05/2004	abdullah	05.00	1200
	05/05/2004	ahmed	10.00	2400
	05/05/2004	as	00.10	12
	05/05/2004	abdullah	10.00	2400
	05/05/2004	ahmed	10.00	2400

Total Payment 8412   Total Time 35.10   No. of subscriptions 5

Figure –23- The Play and Pay report

Form1

	Date	Computer	Start Time	End Time	Duration	Unit Cost	Cost	Discount	Cost After Discount
	05/05/2004	1	06:35.37 ص	06:42.39 ص	00:07	20	140	10/	126
	09/05/2004	1	11:45:22 ص	11:48.46 ص	00:03	20	60	0/	60
	09/05/2004	2	11:45.29 ص	11:48:51 ص	00:03	20	60	0/	60
	09/05/2004	3	11:45.33 ص	11:48:55 ص	00:03	20	60	0/	60
	09/05/2004	4	11:45.36 ص	11:48.58 ص	00:03	20	60	0/	60
	09/05/2004	5	11:45:40 ص	11:49.05 ص	00:03	20	60	0/	60

Total Cost 426   Total Time 00.22   No. of users 6

Figure –24-   The Prepaid report

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