

AN INTERACTIVE PARTICIPATORY SOLUTION TO DISTANCE LEARNING

A Thesis

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by

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DECLARATION

I hereby declare that this thesis is based on the results found by myself. Materials of work found by other researcher are mentioned by reference. This thesis, neither in whole nor in part, has been previously submitted for any degree.

Signature of
Supervisor

Signature of
Author

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ABSTRACT

Distance Learning (DL) is a new phenomenon practices in developed countries around the world. Bangladesh being inspired from that practices started some models of distance learning using- (1) Printed Documents, (2) Audio Cassettes, (3) Video Tapes, (4) Radio Programs, (5) Television Programs and (6) Newspapers. Recent research shows that all these methods have drawbacks e.g. Pre-recorded Telecast, no interactivity, no feedback, no monitoring of how many people attending, no monitoring of the quality of lecture, etc. Modern world solves these problems with expensive technologies like Video Conferencing, Networking, and On-line solutions such as email and chat, etc. however, these are not Technologically Acceptable Models (TAM) for Bangladesh currently. In this paper we propose a solution to the DL problem using National TV and mobile technology. We have tested this method to be found it to be acceptable.

CHAPTER 1

INTRODUCTION

1.1 Education Problem in Bangladesh

Modern communication world has no boundaries. Blessings of this proficiency are shifting our urban life rapidly. Bangladesh is one of the most populated countries in the world with no such blessings as most part of the country can be defined as rural with meager resources. Unfortunately the present infrastructure of our country is not able to offer essential schooling or teaching. Such problem turns to be a permanent drawback in rural education sector. Some reasons we can portrait here are:

1.1.1 Lack of good teachers:

Local inexperienced teachers run most education institutions and learning campuses of our villages. Good qualified teachers migrate to urban institutions for a better life and better careers. Moreover urban teachers do not want to go to rural areas leaving the city. So rural people rarely get the company of good qualified teachers.

1.1.2 Rural infrastructure:

About 60% villages [Jay Jay Din, Novenmber, 2004] of our country do not have sufficient school buildings for students. They use open spaces as classrooms. Because of lack of resources, modern teaching practices are not supported by the current infrastructure of rural areas. We all know that Bangladesh Government made computer study compulsory at High school level. However, schools cannot afford to buy a computer to demonstrate what a real computer is in their basic computer course.

1.1.3 Aged based schooling:

Our educational system is age range based. Average age of class one students will be from 4 years to 8 years. We hardly see any aged person studying class one. Now government has started adult teaching programs but these are not widely spread out. A good number of mature populations of our country are still illiterate.

1.2 Some current approaches to this problem:

Our concern bureaucrats are always trying to solve such shortcomings. Introduction of distance learning is a thoughtful step taken by administration.

1.2.1 Distance learning:

The phrase distance learning means different concepts to different people. As the meaning of the term varies so also the delivery techniques used by different users and institutions. The California Distance Learning Project [1] defined distance learning as: "Distance Learning (DL) is an instructional delivery system which connects learners with educational resources. DL provides educational access to learners not enrolled in educational institutions and can augment the learning opportunities of current students. The implementation of DL is a process which uses available resources and will evolve to incorporate emerging technologies."

1.2.2 Open university program:

The program of Bangladesh Open University (BOU) mostly does distance learning in our country. As television is the most widely spread medium, BOU programs are telecast on television. People around the country watch and get access to educational programs at various levels. Finally they sit an exam at an examination centre.

1.2.3 Newspapers:

The daily Prothomalo first started the concept of published lessons. They published educational exercises and solutions sequentially and

regularly. Along with this practice now almost all newspapers keep places for education in their daily publications.

1.3 Problems with Such Solution:

Even though distance learning is a solution to problem of access to educational resources, but there are some shortcomings:

1.3.1 Pre-recorded:

The BOU programs are pre-recorded. The classes are taken recorded without the presence of students. Authorities record the class as like any other TV program such as Drama, documentary, etc.

1.3.2 No interaction:

No interaction takes place with such an educational environment. We miss the ideal face-to-face classroom environment. An ideal classroom is a place where both teacher and students can share ideas and participate in a learning situation.

1.3.3 No feedback:

After delivering a class, a teacher fails to get the feedback of his/her lecture. Here we do not have a way of communication from the students. Naturally, students may have queries and it is the responsibility of a teacher to clarify the ideas. Here students never get the chance to clear his/her ideas if they have any confusion.

1.4 Solutions Abroad

Distance learning is not a new phenomenon. It has a long history. In 1892, Penn State and University of Wisconsin were the first universities to develop a program of correspondence study. The correspondence model later evolved into Independent Learning Program. During the 1960s, the British Open University in Great Britain developed off-campus teaching systems, using a combination of broadcast and correspondence study systems [1]. Later, many US universities and universities around the world followed the

Open University model to reach millions of adult learners. Presently there are several ways to achieve this goal using different available technologies, e.g., text chat, audio chat, video conferencing, and conference calls.

1.4.1 Online:

Developed countries like United States, Canada, Japan, etc. use online facilities for teaching. All papers and learning materials are stored in a computer and access is given to students. Some are private materials and limited access is given to some people. Some are open for all.

1.4.2 Chat room:

Chat room learning is a new concept in distance learning. Modern students like to chat and enjoy being introduced with new people. So some professors use this media to attract students. Students may log on to a specific chat room and discuss their problem with a teacher. An entire class may be conducted in a chat room [4] One famous US professor said, "Sitting in my office room in Boston I have taught students from the East and the West from within and outside USA who come from different time zones. In one class I had students from Hong Kong, Kazakhstan, Bangalore, Boston and other parts of USA. Imagine the time zones they were in, some will say good morning, some good evening, and others good day, when the class met at 7:30 p.m. US EST."

1.4.3 Video conferencing:

Video Conferencing reaches out to good qualified teachers everywhere if we have good bandwidth. Now its possible for a teacher sitting in USA to conduct a class with students in a classroom located in Dhaka. Video conferencing and conference calls have one major limitation. They do not support "distributed" learning, they are good for point-to-point delivery. In some situations the cost of delivery and the ease of use influence the choice of technology.

1.4.4 Literature review followed by e-mail:

This concept comes with reading references. Some professors give an article and ask students to read and review. At the end of the day students may have to submit reports. For subsequent communication, both students and teacher may use online or any other modern communication media.

1.5 Not Suitable for Bangladesh

1.5.1 Expensive internet:

Internet is still in its infancy in Bangladesh. Few years back it was an amenity for higher-class citizens. Now-a-days the charge is somewhat reduced but still it is away from the hands of lower class society. Rural communities fall in the second category. So the solutions: Online, chat room, video conferencing – are not achievable for the moment in Bangladesh.

1.5.2 One million computers:

Assume the cost of Internet is minimized in such a way that all computer owners can afford to take Internet connection. Then, only one million people would have the capability of being educated via distance learning facilities as according to Computer Jagat, 2004, only about one million people have computers. Our total computer owner is one million and it is increasing at a slow pace. Relying on computers or Internet is therefore is not an appropriate option for our country.

1.5.3 High bandwidth for video conferencing:

For the one million computer users, video conferencing is not achievable as well. We should have a minimum of 1 Mbps bandwidth for video conferencing. Whereas most Internet companies barely can offer 10-20 Kbps bandwidth to a local user. Dial up connection speeds are very poor.

1.6 Our Survey and Paper Review

We went to CEGIS, a company that has a nationwide network to serve their purpose. We have seen satellite pictures of Dhaka city, which provides

evidence they have superior communication infrastructure and access to modern communication technology. But surprisingly we found them using mobile phone technology to communicate with our rural areas. They are using SMS (Short Messaging Service) to instantly share ideas throughout the country. We finally studied their existing infrastructure that uses SMS technology.

Our advisor provided us some papers to evaluate so that we can come across to some suitable solution to meet the challenges. My paper was “[Leveraging ICT to Enhance Education Quality-Bios’ Experience](#)” by Dr. Masuduzzaman, Anir Chowdhury, Raushan Ara Rashid and Afzal Hossain Sarwar. The paper describes CAL, CAT, CATT and compares them with schooling. Finally concludes with a remark. Bangla Innovation through open source, a non-profit trust, dedicated to making ICTs useful and cost-effective for social and economical development projects in Bangladesh. “It appears that introduction of ICTs to schools will be most effective if CATT was introduced before CAT and CAL.” But question comes about our schooling system if we talk about CATT or CAL. So it also suggests, “In this new paradigm, CAT or CAL are not a substitute for schooling. They constitute one integral element of this education model supplementing and enriching traditional institutions, delivery systems, and instructional materials.” The paper also has some references to foreign researchers, however, “Computer cannot replace teachers – teachers are the key to whether technology is used appropriately and effectively.” [**Sam Carlson**, “*The Missing Link in Educational Technology: Trained Teachers*”, *TechKnowLogia*, October-December, 2002, Internet, 2002, p7.]

The paper also suggests that computer instead of being an alternative to teachers, can be the tool for initial preparation of a class. Computer helps with structured opportunities for retraining, upgrading, and acquisition of new knowledge and skills. It can provide continuous support to a teacher. Pilot phases were run at five schools in Kapasia[4]. Where they have pointed some problems using computers in our rural areas.

The cons:

- Fixed location of Computers, Difficult to drag, Limited amount of students who could expose to computer as cannot afford to buy computers for all.
- If we have greater class size then its difficult to view what is shown to the students. Multimedia projector is a option but too expensive.
- All schools cannot afford.
- Some teachers feel their private tuition and effectiveness will be hampered if multimedia is being used so they are against the use of computer.
- Consequently a group number of people against computer aided teaching and vote for traditional education.

So the research paper suggests,

“Developing low-cost infrastructure, software solutions and processes so that CATT, CAT and CAL can be effectively deployed”

1.7 Our Findings

Quality distance education needs a proper mix of technology, contents, processes, and faculty talents [1]. To distribute quality education using available and inexpensive technology is the core of distance education experience. To ensure learning in distance learning programs several things we had to consider, e.g.; delivery of contents, regular communication, continuous feedback, and interactions between the learners themselves, and also the instructors.

Comparing traditional distance education classes with virtual classes was not a salient issue for our distance education research as long as educators assumed that learning at a distance was different from traditional learning in both student populations as well as goals. Access was thought to be the main goal. After our review and survey we tried to take a closer look at how to study distance learning. During research on distance learning, we found that no significant research measures have been done to test outcome

of measures (test scores, attendance, interaction, etc.) between delivering education at a distance and delivering education face to face in a classroom situation.

Relative to taking into account differences among students, we not only look for differences between student perceptions of satisfaction for host and remote sites, but also differences between students at what we here refer to as rural sites and non-rural sites. Our rationale for this approach comes from the recognition that all remote sites may not be equal in the public access to computer and network resources. For example, a remote student at **SRIMONGOL** has reader access to all the research and computing facilities of a rural school. Whereas, a remote student at **TETULIA** may have access to the course, but not ready access to the whole range of technological resources available to the rural student.

Thus, the mere fact that a class is offered within driving distance of the student's home or residence is taken to mean that access issues are moot[4]. The position, however, overlooks well-known disparities between students at remote sites and those at host sites where the instructor is located. On the other hand, we found that television and mobile is the most spread out communication medium and technology that reaches almost every part of our country.

1.7.1 TV:

Television BTV is available through out Bangladesh. Every village has at least one TV set which most people watch. With the introduction of low price Chinese TV set the number of TVs have increased.

1.7.2 Mobile phone:

GRAMEEN Phone claims that they have two million consumers while AKTEL has 1 million - adding the sets of City Cell and Banglalink; the number would be almost 3.5 million. The number of mobile phones is increasing rapidly. Within next 5 years we should have at least 6-7 million mobile telephone users.

If our solution can use the following two things it would be more acceptable model for Bangladesh and maximum number of rural, remote participants will have access. Importantly, now-a-days we are capable of sending SMS between different mobile companies. For example if a GRAMEEN mobile is used to communicate countrywide consumer, it can send and receive SMS from any mobile subscriber no matter whether it is AKTEL or City Cell.

1.8 Our Solution

Mobile phones have a Short Messaging Service or SMS that allows text of maximum 160 characters to be sent in one short burst worldwide between sets. Such text can be easily interfaced with a computer that can then process the text as desired. As such, the mobile set can serve as a (somewhat limited) remote input device for a computer.

Our solution shows how the mobiles' Short Messaging Service or SMS along with a live telecast can be used to create 'almost' an ideal classroom situation. The participants would of course need individual mobile sets. The SMS messages would directly interface with a central server that would process the messages and show processed output to the presenter of the live show.

1.8.1 Live telecast:

From our survey we figured that a "live" interaction with the instructor is the most significant aspect of distance learning process. In our solution we are using the television as the medium for "live" telecast of a class. Thus, an inexpensive mode of communication can be afforded and participant can sense the actual ongoing classroom. Teacher will show particular days plan and the way he/she will continue with his/her lecture and the topic he/she will cover in that particular day. It is important to be conducted "live", so that a presenter can ask questions and respond to clear up wrong concepts. The presenter should also be able to talk to participants. Conducting the class on national television would allow for greater outreach. A course or a country wide training program can be conducted in this manner.

1.8.2 Question based class:

In our solution, the lesson is pre-planned and structured in such a way that questions can be asked every 2 to 5 minutes. The questions would have multiple-choice answers that would be displayed as A, B, C and D or A, D, G and J (i.e. the first letter of the mobile keypad numbers 2, 3, 4 and 5). All the questions for the lesson would be pre-defined and entered into the computer. This would also help the lesson to be planned with achievable objectives in mind. A rule could be that a lecturer would ask at least 10 questions during a class and that each student must attempt at least 8 questions. To get the credits for the course, each student must get at least 5 questions right in each class in at least 80% of the classes.

1.8.3 Student response through SMS:

As our solution is using the TV and mobile phone, participant will answer through SMS. The number of the question should also be included such as Q1D, if the chosen answer for **Question 1** is **D**. The server will register the answer against the candidate's phone number or ID and will do three things: The computer will send a message to those who have not attempted the question and tell them their current status of how many questions have been attempted. The student/participant will feel that the presenter can see him/her and that he/she is being monitored. This gives the taste of real, idealistic classroom scenario. Secondly it will plot graph and finally send individual result at the end of a class.

1.8.4 Computer plots graph of answers:

The computer will create a bar chart of the questions answered and mark the correct answer. The bar chart will be visible to the presenter. A bar on the chart is an answer option of the specific question. The height of the bar is the number of the students choosing that particular answer.

1.8.5 Presenter randomly select student and ask question which all viewers can hear:

To interact with the participants, the presenter will select a wrong answer on the graph and the computer will show those who have the selected wrong answer. The presenter will select a number, which the computer will then dial. Being connected, the presenter could ask the student the logic behind selecting the answer. The presenter on air can then correct wrong concepts. A few other random selections can be similarly made. This would help clear up wrong concepts immediately; “live” during the presentation. This portrays the idealistic classroom scenario.

1.9 Benefits of the Solution

In this proposal we propose to use mobile phone technology to offset some of the constraints of technology complexity and cost considerations. As an example, there are over 3 million mobile cell phone users whereas there are about 1 million computer users. Preferring mobile phone technology over computer/Internet has therefore distinct advantages in Bangladesh. Like wide distribution supporting distributed learning, you may propose to use telephone with data storage device, where audio and text files can be received, retrieved, and used. Satellite television now allows broadcasts to reach any part of Bangladesh, of course almost anywhere in the world. In Bangladesh, even small villages now have at least one television set – the broadcasts being viewed by many people simultaneously in the village. Affluent households generally have more than one set. Using the television as the medium for “live” telecast of a presentation makes good sense. Setbacks that we had with our Open University curriculum are not present; not prerecorded, straight interaction, and continuous feedback. More over it has access to roughly everywhere as long as there is TV set and mobile phone. So Rural populace will obtain the access to modern teaching environment. Age restriction is not an issue any longer; any one having a mobile and TV can assemble can participate.

1.10 System Design

Block Diagram

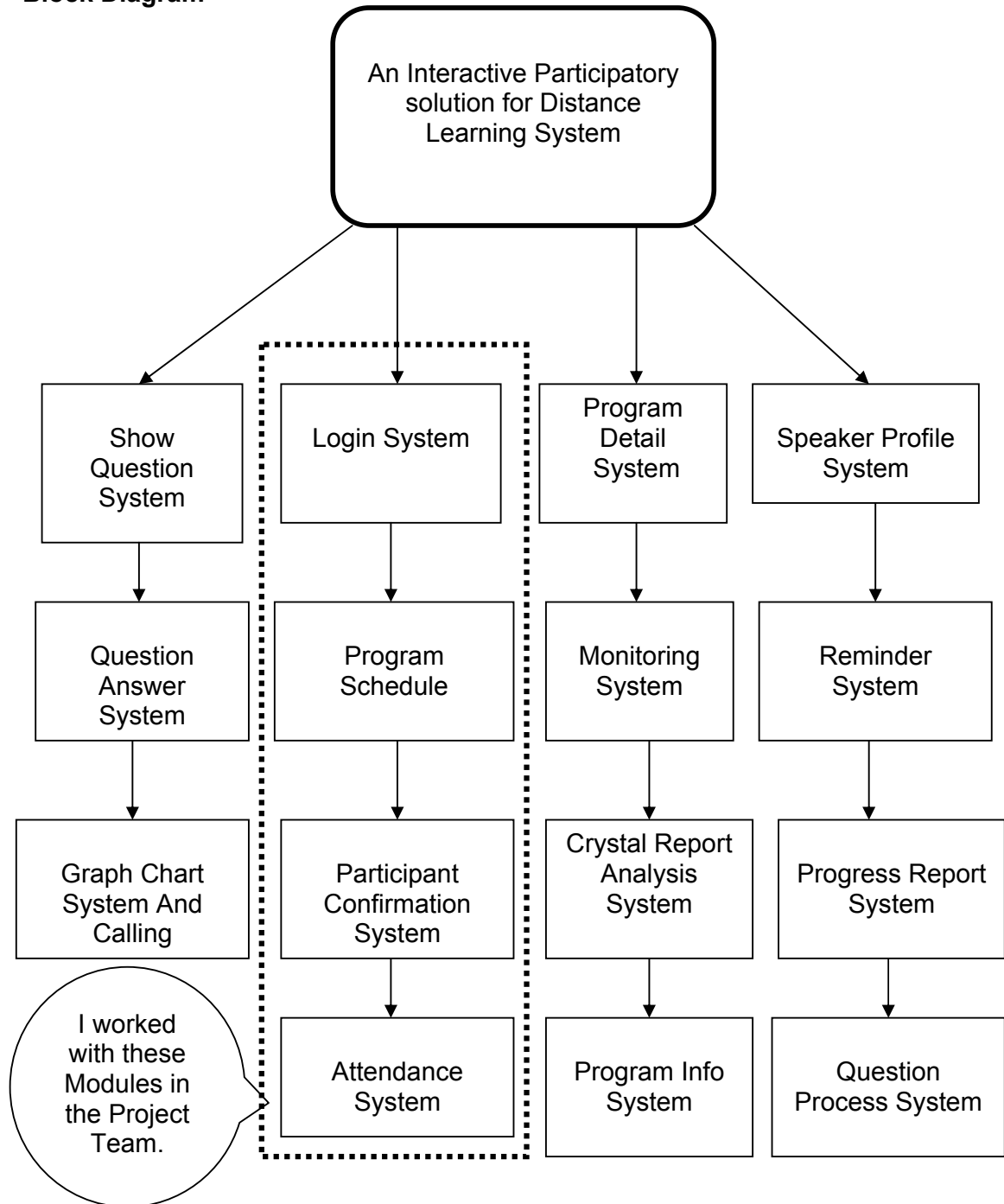


Figure 1.10: Block Diagram of proposed Distance Learning system

The upper figure shows the full system block diagram for an interactive participatory solution to Distance Learning System. There are 15 modules in

the diagram that were distributed to the team members. The list of the team members and corresponding modules are as follows:

Team Members	Modules
1. <i>Shoeb Ahmed</i>	<i>Login System</i> <i>Program Schedule</i> <i>Registration System</i> <i>Attendance System</i>
2. Khalequzzaman	Show Question System Question Answer System Graph Chart System Calling System
3. Shakib Zaman	Program Info System Program Detailed System Monitoring System Report Analyzing System
4. Shafique Shamsur Razzaq	Reminder System Question Process System Progress Report System

CHAPTER 2

METHODOLOGY

2.1 System Development Methodology

A methodology is a formalized approach to implementing the SDLC (System development Life Cycle). Since there are many methodologies, the first challenge we faced is to select which methodology to use. As we were to develop educational software, which is most likely to be student management software, we thought our selves as the stakeholders. Here our advisor could act like our respective teachers who will operate and teach the remote students. We placed ourselves as the students. So requirement gathering became easier to us. We chose RAD (Rapid Application Development) methodology for our system development. There was another reason behind that. We had 9 weeks ahead of us when we started which means we had time constraint.

“RAD [Rapid Application Development] has been demonstrated in many projects to be so superior to traditional development that it seems irresponsible to continue development systems the old way.”

- James Martin, 1991.[4]

2.2 Spiral Development Methodology

RAD has process-centered, data-centered and object-oriented methodologies that follows the basic approaches. We used throwaway prototyping. Our throwaway prototyping methodology is a modified version of the spiral development methodology developed by Barry Boehm,” A Spiral Model of Software Development and Enhancement,” Computer, May 1988,21(5): 61-72.

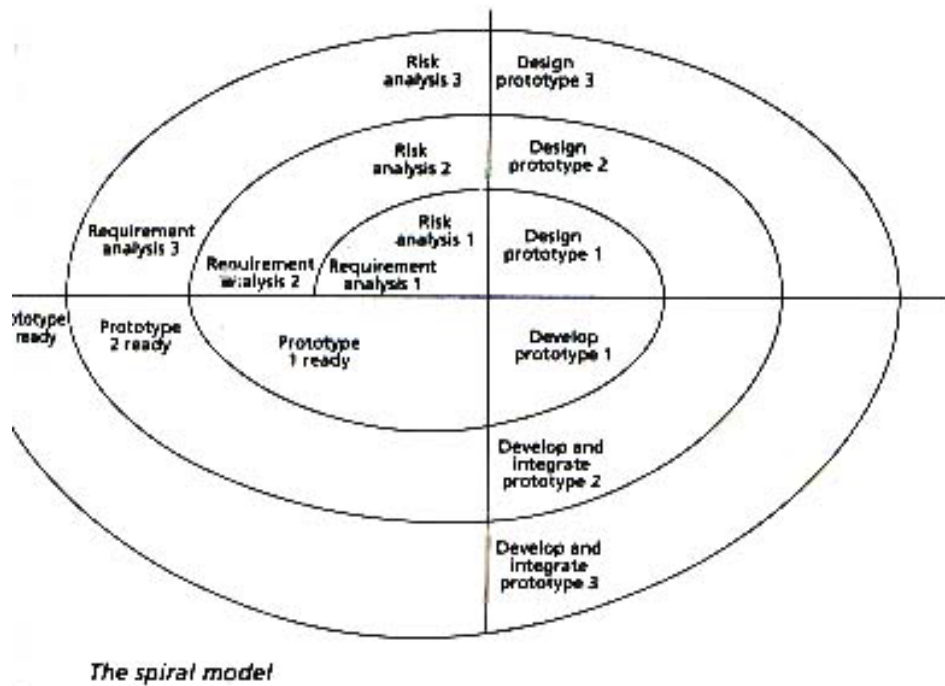


Figure: 2.2 The Spiral Model

As we consider ourselves as stakeholder of the system, requirements are well understood and highly structured. In these cases it is possible to make accurate predictions about system behavior in the early design stages and to proceed towards a problem solution in a sequence of well-defined stages.

CHAPTER 3

SYSTEM DEVELOPMENT

3.1 Planning and Initiation

3.1.1 Log in system

Security is the primary issue of any automated software. And as our system is a complete education system so there has to be a security process. Log in module is a process that does the following things:

1. Authority seeks for entrance to the software and they have to provide user name and password for their identification.
2. System allows them for usage.
3. Any user can change the password, the system encrypt the password.
4. This module accumulates all encrypted records.

There is some checking in my Log in module.

- a) Check for valid, identified user in user record information.
- b) Match the encrypted password.
- c) Check the given password and confirmation of that are same during password change operation.
- d) Check the given old password with encrypted password during password change operation.

3.1.1.1 Benefits:

1. This module secured the access right of the software user.
2. Process is like any other log in system of windows.
3. Make the system reliable as only limited user can change the results.
4. It is simplest solution in security issue.

3.1.1.2 Special Issues or constraints:

As the password is kept in encrypted form, if anyone forgets the password then it is hard to retrieve the old password. It will need same algorithm for the system user to retrieve the password. Which is the programmer's job.

3.1.2 Registration module

The registration system should be automated extensively so that -

1. As before registration, participants must know about the courses or program offered by our education system. It can be achieved by sending a SMS to our server asking about the desired program. Server will responses with a reply SMS.
2. After getting information participants may register themselves for the offered course. They need to send a SMS to the server with Registration request.
3. Server then replies with a confirmation SMS to the specific candidate.
4. Registration module records all the information in server.
5. There is strict security system in accessing the information.
6. The system should generate a list of student registered enrolled in for the system along with the subject's information.

There is some checking in my registration module.

- a) Check the specific program in the offered program list and match.
- b) If requested program exists then checks the starting date of the program. A participant can only register for an upcoming program. If the program is already scheduled or will be scheduled after another program then a participant cannot register for that program.
- c) Check for participant name in the participant confirmation record if he/she is already registered for the specific program.
- d) Check for the available seats in program detail information record with current seats taken on running program record.
- e) Lastly checks in Participant profile record if the candidate information is already available or not. Candidates may have been registered for another

program. So we do not need to keep participant information again on profile record.

3.1.2.1 Benefits:

1. First of all it is the easiest way ever for a program registration.
2. Process is Simple and user friendly.
3. Registration process is not lengthy unlike real life registration.
4. It is cheapest solution.
5. A bigger number of student registration services in less time
6. Minimization of data loss or error.
7. Less paper works.
8. Documentation flexibility (any format of reports can be made).

3.1.2.2 Special issues or constraints:

As we have mentioned it will use SMS for registration, it will take time to get familiar with the new virtual registration process. Participants must read the manual and follow each step carefully to complete the registration process.

3.1.2.3 Feasibility analysis:

1. Most of the participants are familiar with the paper-base registration method. Hence our process is easier and short.
2. Some use automated registration software which is much more complex.
3. Almost all mobile users are familiar with SMS. So it will be easy to implement that.

3.1.3 Attendance system

1. Participants send SMS to the server seeking for attendance.
2. Attendance module then updates the result.
3. Server then replies with a confirmation SMS to the specific candidate.
4. Attendance module keeps records in server.

There is some checking in my attendance module.

- a) Check for valid participant in the record.
- b) Check for valid attendance time comparing that with current time and class start time.
- c) Check for participant name in the participant list record for duplicate attendance for the same day.
- d) Check with schedule class in the absentee record for defaulter.

3.1.3.1 Benefits:

- 1. First of all, it is the smart and effective way to deal with attendance.
- 2. Process is Simple and user friendly.
- 3. Attendance process is not lengthy unlike real life attendance.
- 4. It monitors the student response time firmly.

3.1.3.2 Special issues or constraints:

As like registration, it will use SMS for attendance, it will take time to get familiar with the new virtual attendance process. Participants must read the manual and follow each step carefully to complete the attendance process.

3.1.3.3 Feasibility analysis:

- 1. Most of the participants are familiar with the traditional attendance method. Hence our process is easier and short.
- 2. Almost all mobile users are familiar with SMS. So it will be easy to implement that.

3.1.4 Test plan

There is often a temptation to rush into testing as soon as the very first program modules are complete and spontaneously test different events and possibilities without spending time to develop a comprehensive test plan. This is dangerous because important tests may be overlooked, and if error does occur, it may be difficult to reproduce the exact sequence of events that caused it. So instead, testing like that we do testing systematically and the

results keep inform of documentation so that we must know what has and has not been tested. Below is my test plan sequence:

Unit testing: Unit testing focuses on one unit – Log-in module, registration module, attendance module; it focused on the performance of each module that I built. I used black-box testing method as being a programmer I tested the unit. So no need for interpretation. [ref to testing, Chapter 4]

Integration testing: After my unit testing I checked whether my modules worked properly. So I ensured that the interfaces and the linkage between my modules are working accurately. The focus moved to the flow of controls among my three modules and on the data exchange among registration system and attendance system.

System testing: Our respected advisor and moderator conducted system testing. Our complete system was tested in broad version. It examined how well the system meets our education purposes and its usability, security, and performance under heavy load.

Test Plan For X Module

Tester.....

Date:

Objective

Test Cases	Data Field	Value Entered
1.....		
2.....		
3.....		
4.....		

Expected Result

.....

Actual Result

.....

Acceptance Test: It was more likely beta testing. Our real virtual remote users were sitting back as users and our respected advisor conducted a real class. There were no test data. We used real data and closely monitor the system for errors or useful improvements.

3.2 Analysis

Requirements analysis must ultimately result in a specification, which unambiguously describes what has to be built. The engineering discipline has now developed many ways of specifying requirements. There are plans, models, prototypes and simulations. Prototyping is excellent choice when timelines are short because they best enable the project team to adjust the functionality in the system on the basis of a specific delivery date, and if the project schedule starts to slip, it can readjusted by removing functionality from the version or prototype under development. We being the project developer had our solution with mobile technology and we use SMS for communication. It is a new technology adopted by the computer programmer. So there is high risk with such technology. Throwaway prototype is particular appropriate for a lack of familiarity with technology because it explicitly encourages the developers to develop design prototypes for areas with high risks. So we had chosen throwaway prototype for our initial requirement gathering.

3.2.1 Building the throwaway prototype

There are two important aspects here. One aspect is communication. In all of these processes it is necessary to reach agreement, to specify what we are to do and to represent it in an unambiguous way. The second aspect is organization of this work into a process that must eventually produce a new system. Doing so is not an easy work to accomplish. Our respective advisor asked us to conduct a class among ourselves. One of our group member became teacher where another became student. Thus after gathering knowledge from demo class, we first defined the whole virtual classroom scenario using everyday term. Where the language commonly describes the way the teacher and the students works. The next step we did is defined those term using general system terms. Finally we produced logical steps of

our whole system. We again did some paper work and turned those steps into computer steps.

We were concerned about the triggers in the complete scenario. We must need to understand some important aspects:

- The main objectives that drive what and how work is done
- The information people need, to do their jobs.
- The data (definition, volume, size, etc.) handled within the organization to support jobs.
- When, how, and by whom or what the data are moved, transformed, and stored.
- The sequence and other dependencies among different data-handling activities
- The rules governing how data are handled and processed
- Key events affecting data values and when these events occur

We in that case discussed with our admirable advisor to work out such difficulty. He recommended us to put up a throwaway prototype model. He advised us to exploit excel as the computer tool. Because in excel we be able to see the unprocessed data in front of us and then also monitor the data flow. Which can solve our data-handling problem. So we designed our first prototype using excel and macros. We noticed that here we have three stakeholders; First stake holder is administrator -- who will design and offer program, teachers are responsible for conducting classes and students will join the virtual classroom as participants. Therefore, we divided entire process in respect of activities.

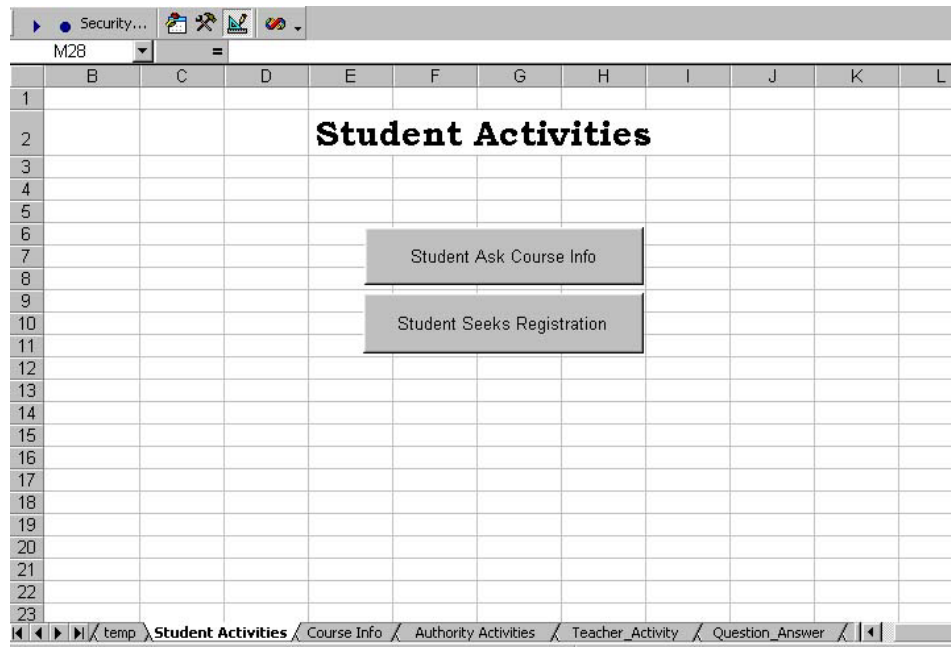


Figure 3.2.1 Students' Activity

At the foundation I tried to shape out what a student require doing to play a part in a class. As my module was registration, I worked out that module. I, using visual basic scripts on excel, designed the interface and put data. I saved that data on another excel sheet. Thus I distinguished and observed the data flow.

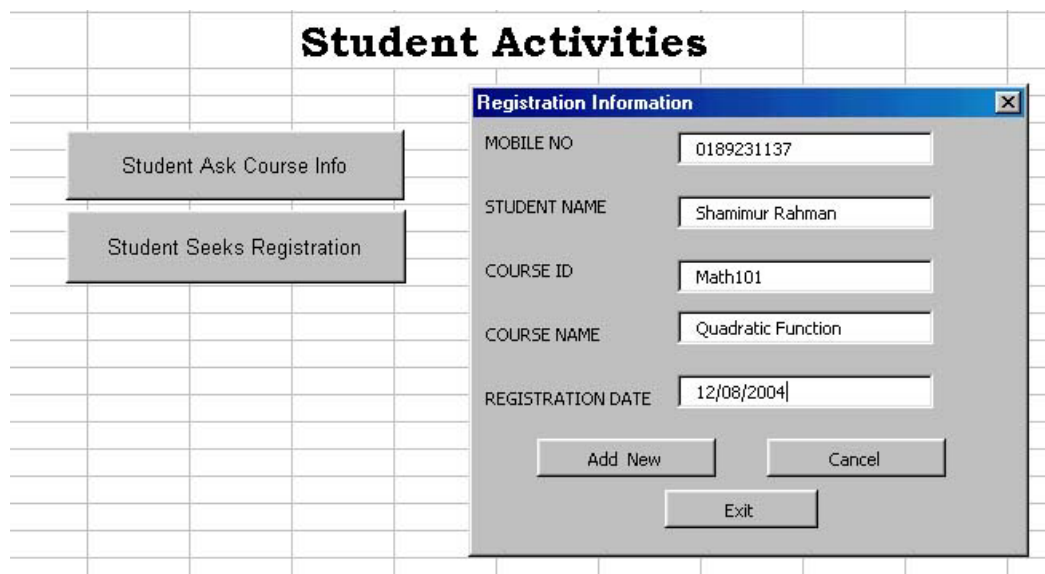


Fig. 3.2.2(a) Registration

Here you can spot that a student is seeking for registration. As we will conduct virtual class, we do not require much information as like traditional registration practice. Moreover we will apply SMS, which has a constraint of 160 characters max. In the prototype I used the mobile number as unique ID of a student and I gave each student a registration number. During system building I was concern about the validity and checking.

We know authority plays a vital role in the registration process. So I had an option for the authority to permits an individual registration. When a student seeks for registration, the registration request goes to a temporary excel worksheet. Then after authority permits, the request turns to a registration data and to be saved in the record.

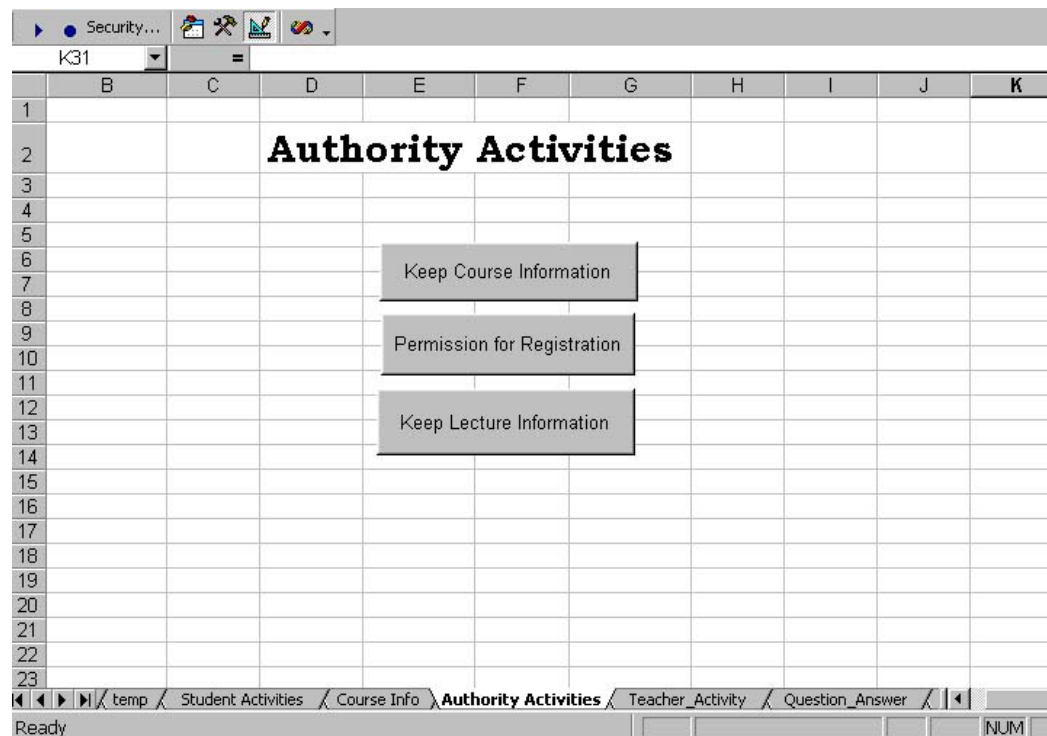


Fig.3.2.3: Administrative Activity

A	B	C	D	E	F	
Mobile No	Student Name	Course Id	Course name	Date	Permission	Regist
017179702	Kamal Hossain	CSE101	COMPUTER FUNDAMENTAL	29/02/2004	REGISTERED	reg 1
01112345	SHAKIB ZAMAN	CSE102	PROGRAMMING FUNDAMENTAL	16/03/2004	REGISTERED	reg 2
011034567	SHOEB AHMED	CSE101	COMPUTER FUNDAMENTAL	23/03/2004	REGISTERED	reg 3
0171730911	Khalaquzzaman	cse102	programming fundamental	08/04/2004	REGISTERED	reg 4
0189231137	Shamimur Rahman	Math101	Quadratic Function	12/08/2004	REGISTERED	reg 5

Fig.3.2.4(a) Registration Data

Here we can see that, the registration requests were saved in a different excel worksheet after the permission given by the authority. Thus I gained knowledge about how to make the flow of data and handled those in my registration module.

Attendance modules works like the same way. Students after registration seek for attendance. The system then checks that with registration list and keeps those in the sheet. For the attendance, I used student mobile number as I distinguish the student with their mobile number.

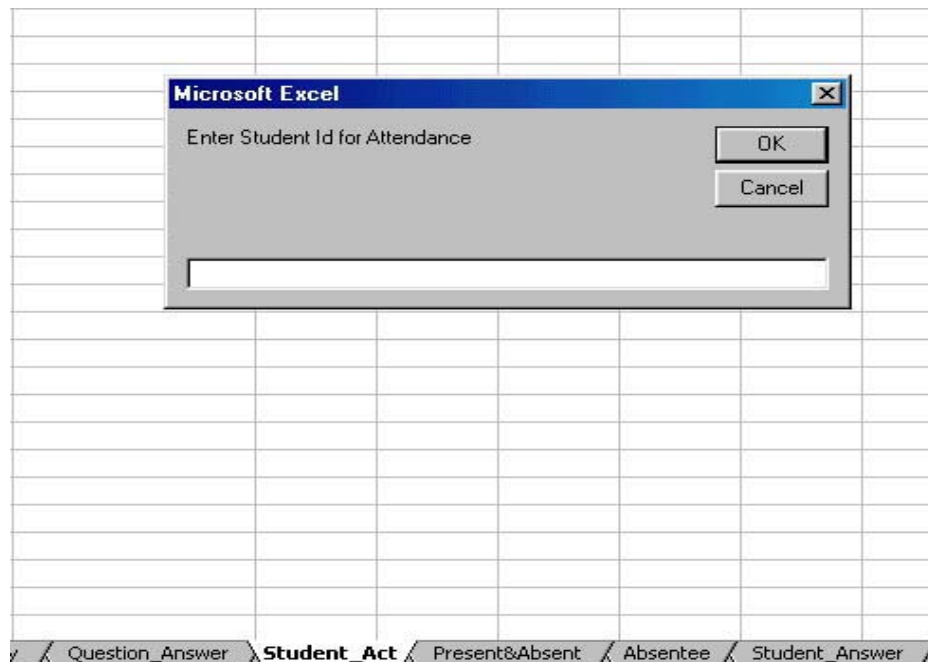


Fig. 3.2.4(b) Attendance

More about attendance is that after the registration when authority confirms a class, all registered student lists of that particular course goes to the absentee list automatically. When a student responses for attendance it then omit the particular student from that absentee list and adds the name in present list. Thus it acts as a daily procedure. Regarding attendance mark, I was unsure about how to organize the whole marking procedure of a particular student. So I kept that for second prototype.

	A	B
1	Present	Absentee
2	0189231137	015231137
3	0179231137	015231135
4	011231137	015231133
5	019231137	015231130
6		

Fig.3.2.5 Attendance Data

Here we can see the sample list from the excel work sheet. Log in system I only design the interface but keep that for second prototype. Hence I came to advisor and showed him the progress.

3.2.2 Review and suggestions from advisor

During our presentation of the prototype, our advisor and moderator were keen about the validations and checking. They asked about the data flow and showed some techniques to handle data properly. Regarding my work area they pointed out some key issues:

- How to send registration data in smart way through SMS
- How to pass my registration information to other working modules
- Whether we need the participant name along with other data
- Does a student always need to register for each single course?
- What else information I may need for remote registration
- How to deal with multiple requests for registration
- How to pass attendance information to other modules
- How to check duplicate registration request through SMS
- How to check duplicate attendance through SMS

Now again they advised me to find out some solutions to these issues and put up another prototype. They asked me to formulate a real working prototype instead of making throwaway prototype. Because after the excel prototype I gathered ideas about the data flow and I had a clear visualization of what are the things to do next.

3.2.3 Building the second prototype

A true working prototype methodology performs the analysis, design and implementation phases concurrently, and all three phases are performed repeatedly in a cycle until the system is completed. While creating the prototype, we had performed the basics of analysis and design. Our aim was to implement a system prototype, a “quick-and-dirty” program that provides a minimal amount of features. Our first prototype was not a working prototype completely rather helped to understand the requirements with a series of screens. That was shown to our advisor and moderator, who provided comments, which were used to reanalyze, redesign and reimplement our second prototype with few more features. This prototype reassured the

authority that we are working on the system (there are no long delays in which authority see little progress), and the approaches helped us to move quickly refine real requirements. Prototyping, however, helped us to quickly convert basic requirements into a working, though limited, version of the desired information system. We were optimistic that prototype will then be viewed and tested by the experienced onlooker.

We used access as database and used visual basic to design the interface. We were concerned about finalizing the design and proper dataflow rather using SMS as the input. Below is the description of my module from the final prototype.

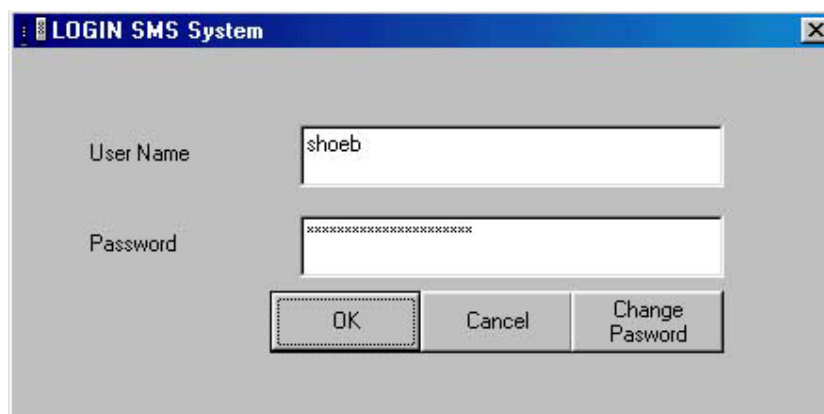


Fig.3.2.6 Login System

The log in system of the prototype is the first step that I made during prototype building process. The system checks the user name and password given for that particular user. As for the prototype I did not write any encryption algorithm or any algorithm to check the case sensibility of the password.

The screenshot shows a window titled "LOGIN SMS System". It contains four input fields: "User Name" with the text "shoeb", "Old Password" with masked characters "xxxxxxxxxx", "New Password" with masked characters "xxxxxxx", and "Confirm Password" with masked characters "xxxxxxx". Below the fields is a note: "(* Password must be atleast 3 Character)". At the bottom are two buttons: "OK" and "Cancel".

Fig.3.2.7 Password Change

The above form is used for changing password of a specific user. All users must have the option to change their own password. So I used the same log in form to change the password. Here I sense some validity and checking to make it perfect. But I kept that implementation for final prototype (System).

Before registration, I was aware of finalizing detailed information of a particular course.

The screenshot shows a registration form with two main sections: "Student Info" and "Course Info". The "Student Info" section has two fields: "Student Mobile" with the value "0171730911" and "Student Name" with the value "Shoeb Ahmed". The "Course Info" section has three fields: "Course ID" with the value "BUS101", "Semester" with the value "Fall'04", and "Registration Date" with the value "2 / 9 /05". To the right of the "Student Info" section is a button labeled "Add New". To the right of the "Course Info" section is a button labeled "Back to Main".

Fig. 3.2.8 Schedule and Figure 3.2.9: Registration

So I along with my one group member fix the detailed course information. Then I think of how to make combination with registration module. It became easier to work with validity, as we knew what to offer and what to do. On the above u have seen unlike first prototype we have less information to keep. We had think of semester here. We like to distinguish each session with another so introduced air class. Which will operate unique. The system will take air class information by own. It is kind of auto number generation.

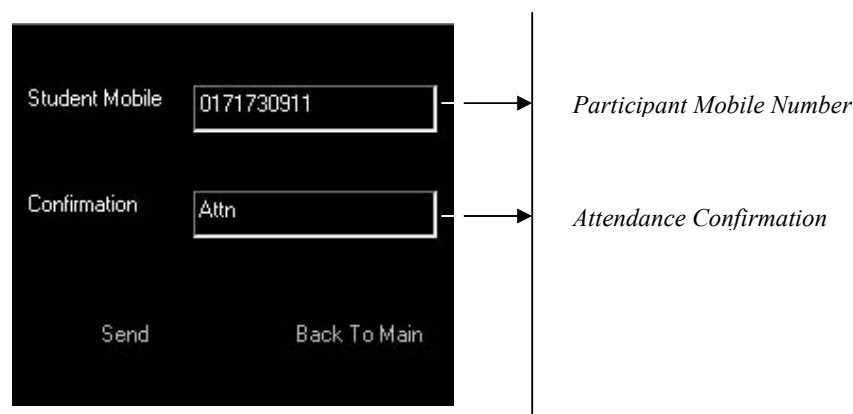


Fig.3.2.10 Attendance

Finally I made up the attendance system. Here I had the keyword attn. I had introduced the attn thinking about the SMS system. As I had nothing to modify here with the first prototype so I had introduced the attn concept thinking about next step. I will discuss the concept later on my final design chapter.

3.2.4 Review and Suggestion from Advisor

Prototypes may become very idiosyncratic to the initial user and difficult to diffuse or adapt to other potential users. That is what we had during our second prototype. We were thinking the whole scenario according to our view. For example we were thinking about semester and session of a particular course. Where as very few rural people have good concepts about such terms. So our advisor pointed out those terms and gave instruction. He suggested that we do not need such terms and date is enough to distinguish a class from another class.

Attendance system was according to the mark and was running fit. Log in system needs some inner changes as we had pointed out while building the system. I require introducing some encryption algorithm to defend the password firmly. After the long and spiral prototyping method in development, we had come out with such improvements:

3.2.5 Identifying improvements

3.2.5.1 Informal benchmarking:

The first step in the strategy was to informally benchmark existing classroom scenario of some popular classes in our university. Our aim was to identify those techniques and features that usually make a class ideal classroom environment.

3.2.5.2 Problem analysis:

Since our respected advisor and moderator have probably the best ideas about class, I decided to simply solicit their ideas and opinion on features in our discussion session. We, after getting advised from our advisor, conducted a class being a teacher and students among ourselves. Thus I carried out the problem analysis.

3.2.5.3 Technology analysis:

The next step was the technology analysis. I decided to take help from online. As SMS application not yet been developed in such a way. Only few companies started this trend but they are not supportive for huge features like us. We went to CEGIS to see their SMS project and got some ideas about that particular technology. I personally reviewed some online SMS site like sms.ac through which we could get SMS from computer. For our prototype, we limited this technology issue. We were concern about the proper input and output; medium comes after the proper use of those.

3.2.5.4 Outcome analysis:

The goal of outcome analysis is to promote creative thinking to develop other ways of creating business value of our system. Our whole team finally

integrates the improvement ideas and develops as outline of the final system. After some refine in it into more detail through a series of prototype, our final system will be used for beta testing and thus at the end will be used as full working system.

The next step was to represent the general system terms in abstract system terms that were useful to me but could still be understood by the users¹. Such system terms are useful to build the analysis models, which became part of the system specification and are easily converted to computer systems. We sometimes called them Data flow diagram.

3.2.6 Designing the Data flow diagram

The data flow methods center around modeling both the system and the subjects' worlds, although they use mainly system world terms. Consequently, they require analysis to have particular skills in expressing subject world requirements in system world terms. Models in structured systems analysis are made up of three components: the process, the data and the system functions. Data flow diagrams model system processes and are one of the most important modeling tools used by system analysts. Although the data flow diagram implies a focus on data, this is not the case. The focus is mainly on the process or activities that are performed [3]. Data modeling, we will prepare from data flow, presents how the data created and used by processes are organized. I will try to present a combination of logical DFD and physical DFD so that I can easily converted them to entity relationship diagram and then finally able to find data modeling.

I will first describe how I modeled the systems using data flow symbols. A common way to begin is to model the whole system by one process. The DFD that does this is known as the context diagram. It shows all the external entities² that interact with the system and the data flows between these external entities and the system.

The below figure shows the data flow in respect of context view. It models the "Interactive distance learning System". This system interacts with

three external entities: Authority/System Admin, Participants and Presenters. Participant requests for registration and attendance afterwards where as admin can by hand make registration for students and prepare reports through system. Presenter speaks live and takes interactive class using some facilities like graph and calling through mobile.

Context Diagram

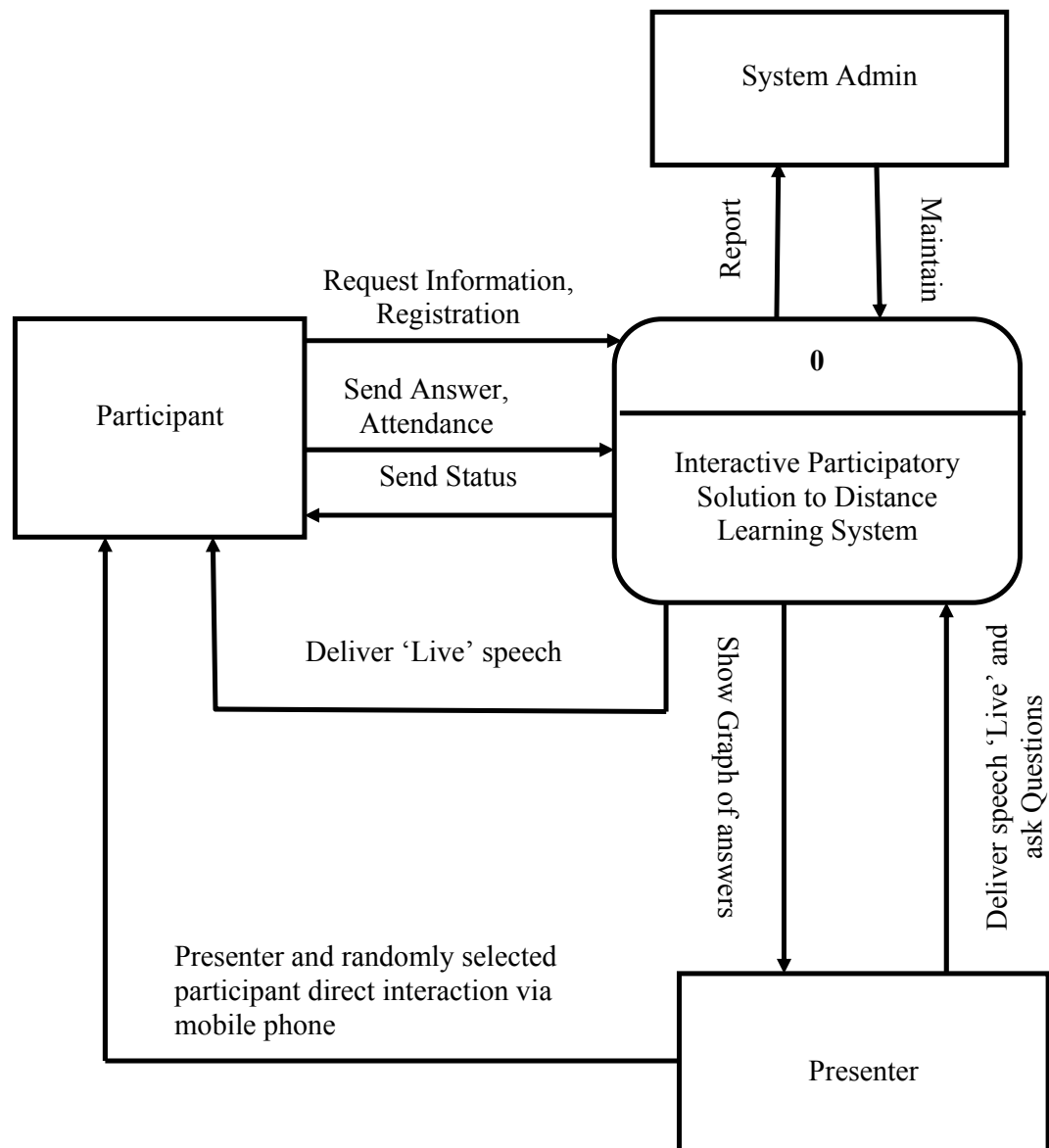


Fig. 3.2.11 Context Diagram for Interactive Participatory Solution to Distance Learning System

3.2.7 Dataflow Diagram

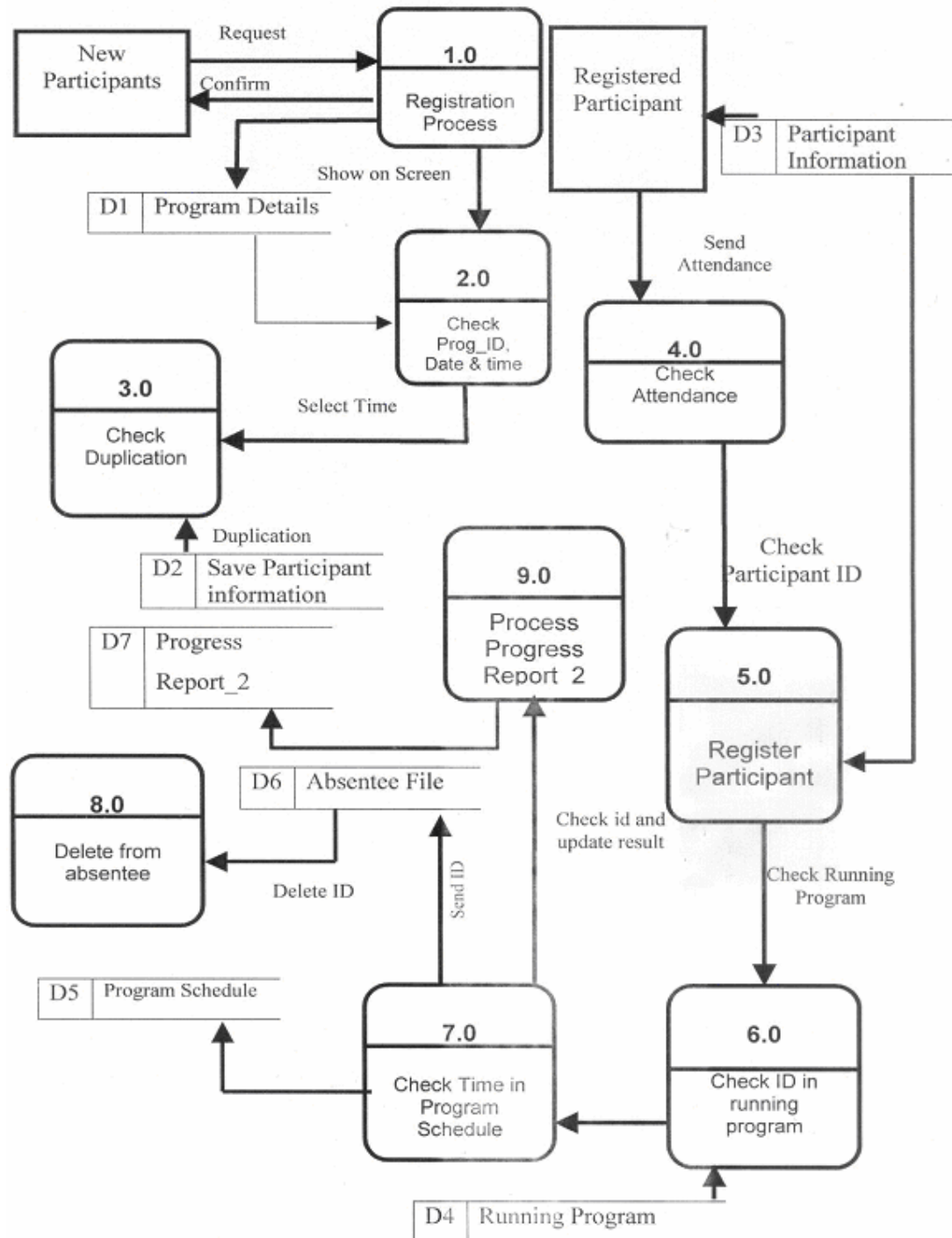


Figure 3.2.7 Level-0 Data Flow Diagram for Interactive participatory solution to Distance Learning System of mv modules

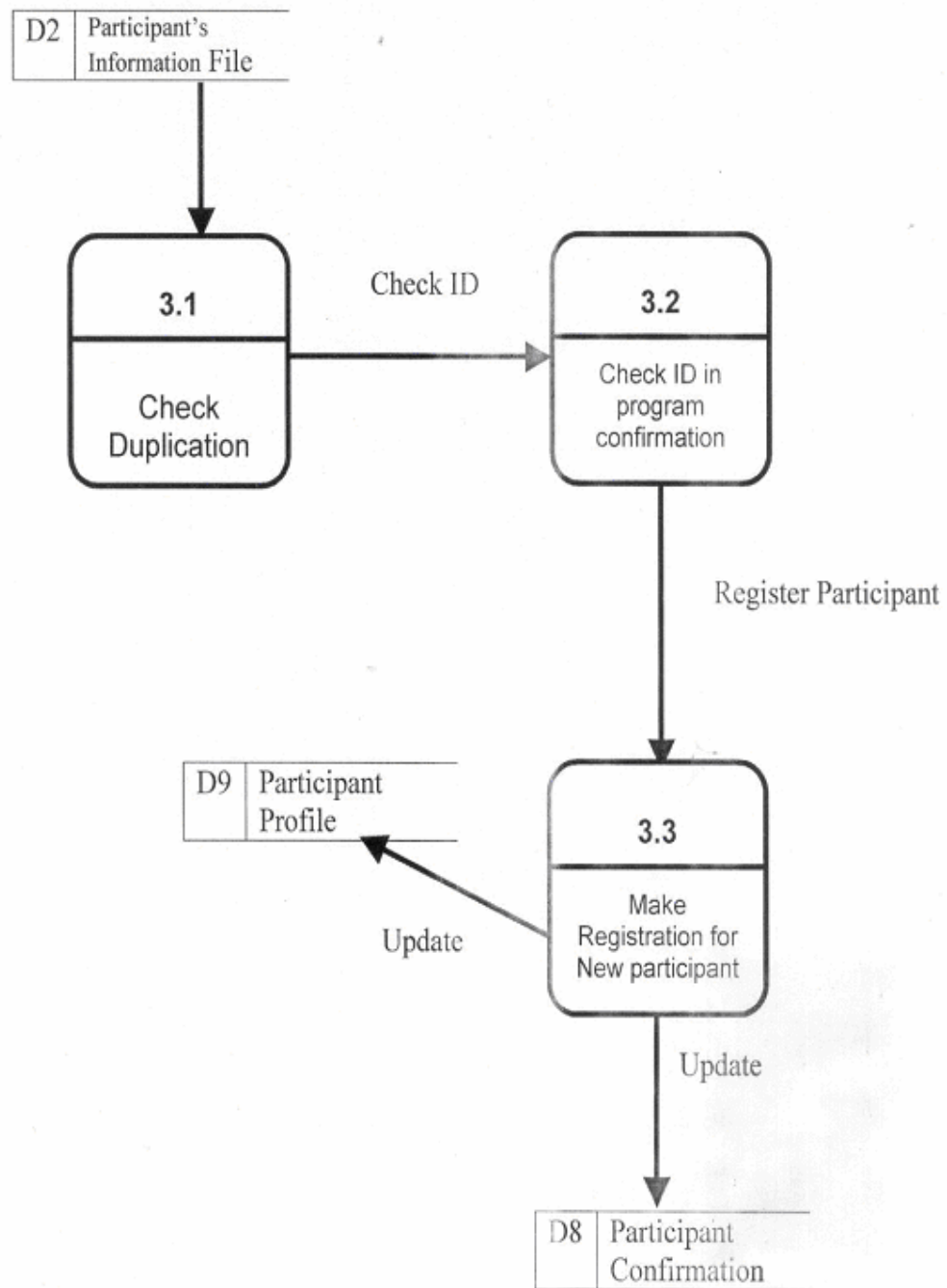


Figure 3.2.7 Level-1 Data Flow Diagram for Interactive participatory solution to Distance Learning System of process 3.0

3.3. Design

The design phase of the systems development life cycle used the requirements that were gathered during analysis to create a blueprint for the proposed system. A successful design builds on what was learned in earlier phases and leads to a smooth implementation by creating a clear, accurate plan of what needs to be done. The objectives are:

- Understanding the initial transition from analysis to design.
- Be able to create physical data flow diagrams and entity relationship diagram.
- Be familiar with the custom, package, and outsource design alternatives [3].

Throughout the design phase, I carefully considered the new system with respect to the current environment and systems that exist within current infrastructure. Major considerations of the “how” of a system are environmental factors, such as integrating with existing systems, converting data from legacy systems, and leveraging skills that exist in-house [3]. Although planning and analysis phases are taken with prototype, the goal of my design phase is to create a final blueprint for my system that makes sense to easily implement.

I have divided the design phase into four sub-phases:

1. Data Modeling
2. Architecture Design
3. User Interface design
4. Data Storage Design

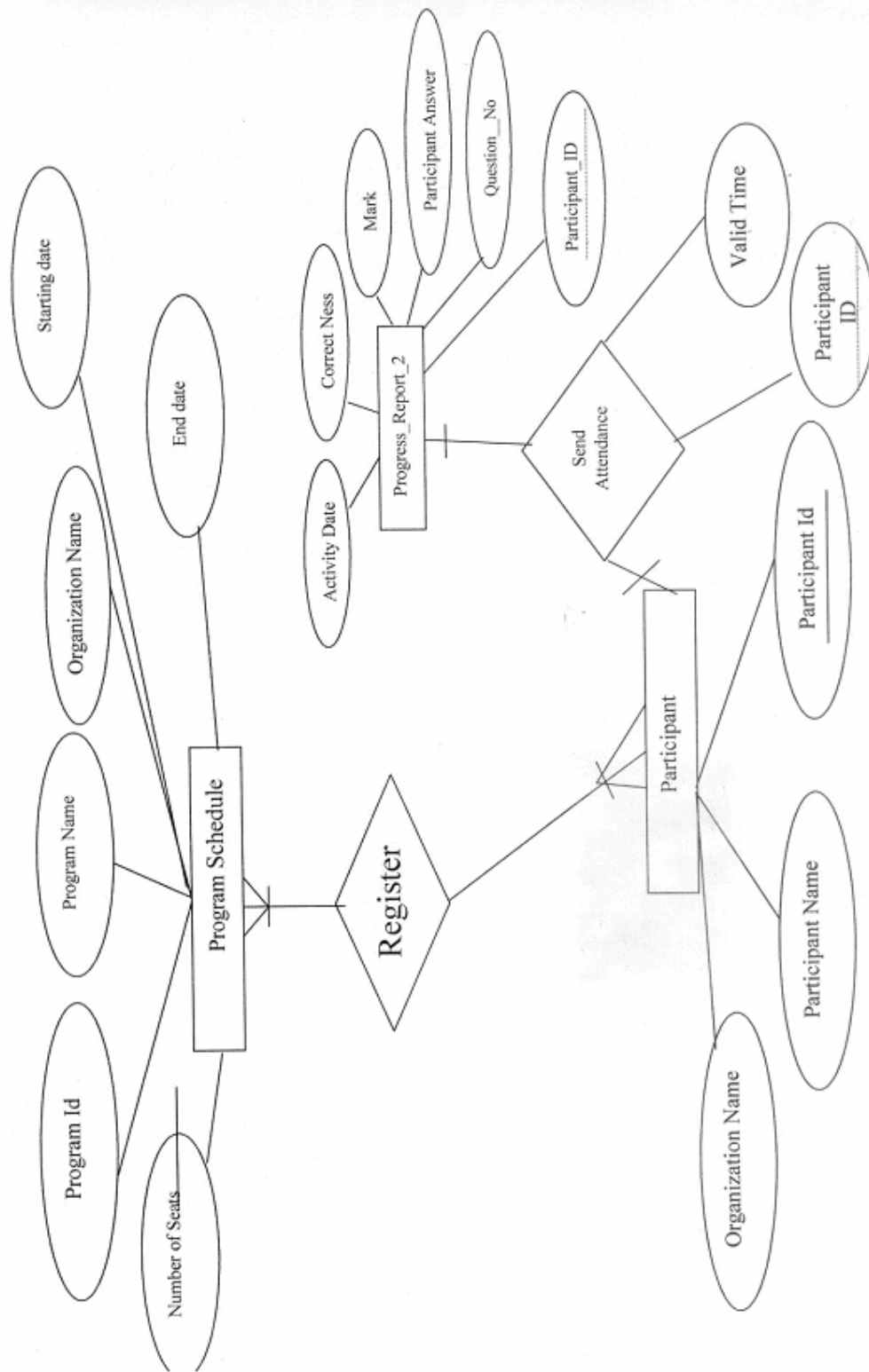
3.3.1 Data modeling

A data model is a formal way of representing the data that are used and created by a business system; it illustrates people, places, or things about which information is captured and how they are related to each other [3]. A data model describes the data that support the whole system processes in a proposed system. During the analysis phase, all model represents the logical organization of data without indicating how the data are stored, created, or manipulated so that we can focus on requirement without being distracted

by technical details. In the design phase, analyst draw data model to reflect how the data will physically be stored in databases and files. So in this sub-phase my main objective is to be able to create an entity relationship diagram. In between we must understand how to balance between entity relationship diagrams and data flow diagrams.

3.3.1.1 Entity relationship diagram

3.3.1.1 Entity Relationship Diagram



3.3.2 Architecture design

An important component of the design phase is the architecture design, which describes the proposed technical environment for the new system. The technical environment contains the hardware, software, and communications infrastructure on which the new system will be created and the methods for supporting the system's security needs and global requirement. The deliverable from the architecture design contains the network model, the hardware and software specification, and the plan for security and global support [3].

Computer Architecture:

There are three fundamental computing architectures. In server-based computing, the server performs virtually all of the work. In client-based computing, the client computers are responsible for most of the application functions. In client-server computing, the work is shared between the servers and clients.

We have used the client server architecture with attempting to balance the processing between the client and the server by having both do some of the application functions. In this design the client computer will have our software, whereas the server is responsible for the data access logic and data storage. The application resides on the client fully.

As we have mobile functionality, we have connected the mobile with our client machine. Now days we know mobile have operating system like computers. So we can describe our architecture as three-tiered architecture by definition. Input data comes to mobile phone then passes to server for query through the client computer. The client computer is acting here as only application server.

Our client-server architecture is able to support different types of client and server. We have used linux-based server with the windows based client.

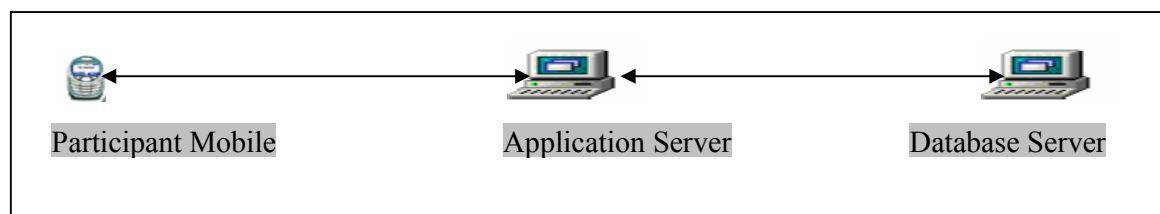


Fig. 3.3 Computer Architecture

3.3.2.1 Advantages of such architecture

Cost of infrastructure:

One of the strongest driving forces toward client-server architectures is the cost of infrastructure [4]. Earlier we thought of server and the cost increases surprisingly. Simply putting the personal computers are 10 times cheaper than the server.

Control and Security:

Our core database server is far away from the input device. It needs access right and security code to access and run a query. The software has the password protection so that only authorized user can handle the application server.

Scalability:

Scalability refers to the ability to increase or decrease the capacity of the computing infrastructure in response to the changing capacity needs [3]. We were pretty concern about the SMS load and we designed in such a way that if we need to increase the receiving power in future, we can only add a mobile to the application server. If we need further, we can simply add another application server along a mobile with the database server. Such our design is scalable in respect with time.

3.3.2.2 Infrastructure design

In our cases, we built a system that has hardware, software and communication infrastructure already in place. As we do not have any technological infrastructure in our rural areas and that is the target market of our system. Further, the coordination of infrastructure components was our main issue during design. Below I tried to summarize some of the key elements of infrastructure design to give a clear view:

Network Model:

The network model is a diagram that shows the major components of the information system (IS), such as servers, communication lines, and networks [3]. As we are using the mobile phone, so our network model is the existing mobile network in our country except the server portion. Creating the

network model is a top-down exercise whereby we first graphically depict all of the locations where the application will reside [4]. But our aim to spread out our solution through out the country with the help of mobile network. So we will consider an area and show the network model of that particular part.

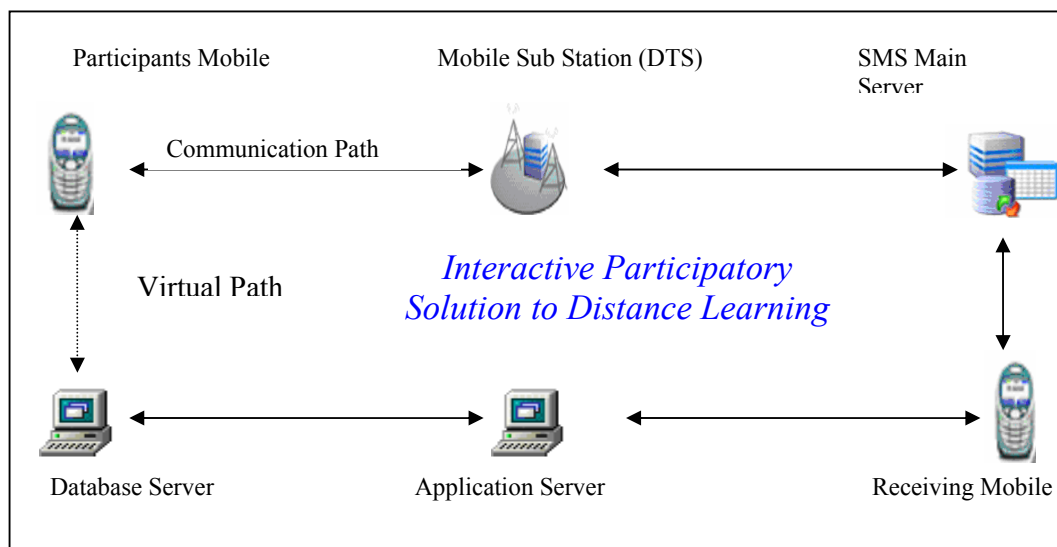


Fig .3.3.1 Network Diagram

Hardware and Software Specification

The design phase is the time to begin acquiring the hardware and software that will be needed for the future system. First I have created a list of the hardware that is required to support my system. The network model provides a good starting point for recording the hardware needs because each of the components on the diagram correspond to an item on hardware requirement list. Second step is to find out the minimum requirements for each piece of hardware. I conveyed such requirements as the amount of processing capacity, the amount of storage space, and the receiving capacity of SMS. Finally we considered the factors that affect hardware performance, such as response time with the SMS, data volumes, and memory requirements for the request query etc. The figure presents the specification for my systems:

HARDWARE

Minimum Requirements:

- 1.8 GHz Processor
- 256 megabytes of RAM
- 40 gigabyte Hard Disk

*Hardware and Software
for
Interactive
Participatory Solution*

SOFTWARE

- Operating System
- Oracle 9i
- Visual Studio Net
- SMS Server Control
- Mobile Software

Security:

Another piece to include in architecture design is a security plan that addresses how to keep the application and its data secure. Some people will try to gain unauthorized access to the system, some will do no harm; others attempt to access a system for personal gain or to do sabotage the system in some way [3]. Several techniques are available to increase security. The use of password and encryption are central to any type of secure system. I had used this technique to protect the system.

3.3.3.0 User interface design

A user interface is the part of the system with which the users interact. In our system we do not have any direct interaction of our actual user. They will interact with the system through their own mobile phone. But we have to design the user interface component such as input and output of my modules. In addition I designed some user interface form for the operator of the system.

The screenshot shows a form titled "Program Schedule" with the following fields:

- Activity Date:** A date picker showing "10/29/04".
- Program Name:** A text input field.
- Program ID:** A text input field.
- Speaker Name:** A text input field.
- Speaker ID:** A text input field.
- Start Time:** A dropdown menu labeled "Combo1".
- End Time:** A dropdown menu labeled "Combo1".

Fig.3.3.2 Program Schedule

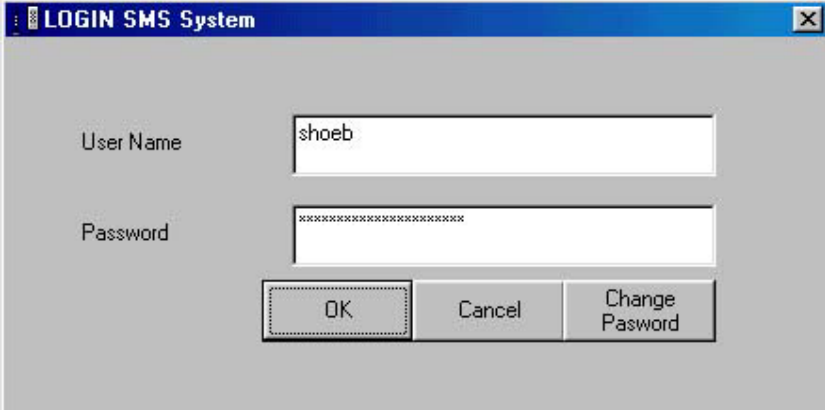
The first element of the user interface is the layout of the screen form, which is usually rectangular shapes with navigation, and a center area of the form for inputs and outputs. The above in the interface form of program schedule through which the concern authority will schedule for upcoming program. I tried to include significant white space, perfect color and be consistent with fonts. Most of all I tried to design to support both novice/first-time users and experienced users.

The screenshot shows a form titled "Participant Attendance" with the following fields and buttons:

- Student Mobile:** A text input field containing "0171730911".
- Confirmation:** A text input field containing "Attn".
- Buttons:** "Send" and "Back To Main".

Fig.3.3.3 Participant Attendance

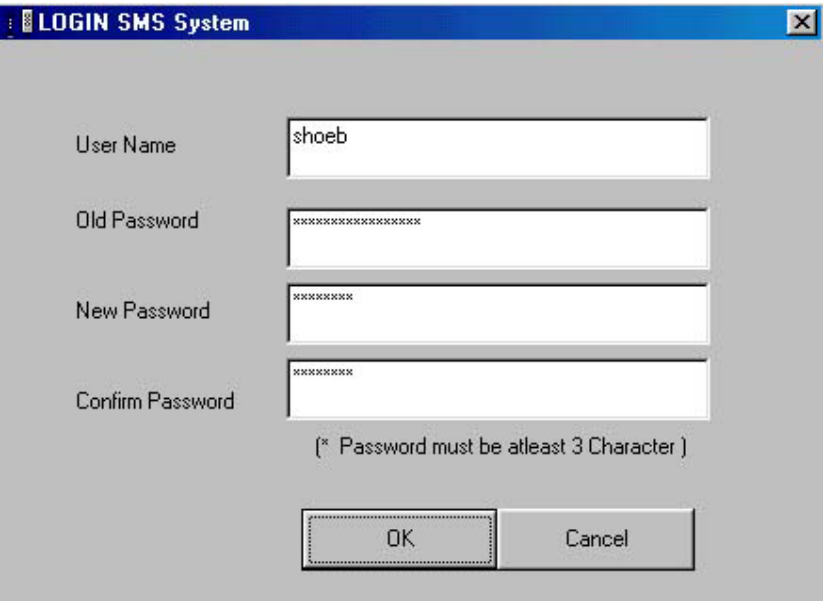
Above is the user interface for attendance. Normally all participant will be sending their attendance through their mobile. Here I recognized the common patterns of actions that the users will perform. We know the user will only response us that they are present. So here we only want to know the identification number.



The screenshot shows a window titled "LOGIN SMS System". It contains two input fields: "User Name" with the text "shoeb" and "Password" with masked characters "xxxxxxxxxxxxxxxx". Below the fields are three buttons: "OK", "Cancel", and "Change Pasword".

Fig.3.3.4 System Login

As we have discussed on the analysis section about log –in system, the interface is very simple over here. I just maintained the standardize log in procedure and thus designed the interface of the log in system. I have used the same interface for changing password. I just added another set of control to meet the extra requirement.



The screenshot shows a window titled "LOGIN SMS System". It contains four input fields: "User Name" with the text "shoeb", "Old Password" with masked characters "xxxxxxxxxxxxxxxx", "New Password" with masked characters "xxxxxxxx", and "Confirm Password" with masked characters "xxxxxxx". Below the fields is a message: "(* Password must be atleast 3 Character)". At the bottom are two buttons: "OK" and "Cancel".

Fig.3.3.5 Password Change

Here we can see the interface when a system user will want to change the password. It is something universal interface. Everywhere we see the same format and same input criteria. So I maintained that interface. Finally I tried to design interface in such a way that it minimize user effort-for example, by requiring no more than three clicks from the main menu to perform an action.

3.3.3.1 Input design

The goal of the input mechanism is to simply and easily capture accurate information for the system [3]. As we have used prototype so we have gathered the information of input earlier and changed that by the course of time with the appropriate requirement. So here we were concern about the validation by using some combination of completeness checks, format checks, range checks, check digits, consistency checks, and database checks.

3.3.3.2 Output design

The goal of the output mechanism is to present information to users so they can accurately understand it with the least effort [4]. I mainly was concern about the message that I will deliver to the user with their response. I had some mistakes with prototype and my respected advisor correct me with some suggestion.

3.3.4.0 Data storage design

My first step was to convert the E-R model to a relational model, which then be tested to see if it contains any redundancies. A number of criteria were pointed out and implemented for such test. They were defined in terms of functional dependencies and relation keys. Relations that satisfy the criteria is well known as normal relations. I tried to ensure that my data model contains only relations in the highest normal form.

3.3.4.1 Registration system

Table Name: Participant Confirmation

Purpose: Store registration information.

Columns						
Name	Datatype	Size	Scale	Nulls?	Default Value	
PROGRAM_ID	VARCHAR2	10				
PARTICIPANT_IDENTITY	VARCHAR2	13				
CONFIRMATION_DATE	DATE					

Fig.3.3.6 Participant Confirmation

Description: I am saving participant information while registration. Here I only link the participant with respect of their participating course. Registration dates are also kept in the database.

Table Name: Running Program

Purpose: Store current participant.

Columns						
Name	Datatype	Size	Scale	Nulls?	Default Value	
PROGRAM_ID	VARCHAR2	10				
PARTICIPANT_IDENTITY	VARCHAR2	13				

Fig.3.3.7 Running Program

Description: While design, I was concerned about the access time and process time. I know I have to access the participant list of a running program on regular interval, not only for my module but for all module of the system. So I distinguish the ongoing participant list from the universal participant list. Here I m keeping all the participant of current running program.

Table Name: Participant Profile

Purpose: Store participant personal information.

Columns						
Name	Datatype	Size	Scale	Nulls?	Default Value	
PARTICIPANT_IDENTITY	VARCHAR2	13				
PARTICIPANT_NAME	VARCHAR2	30				
ORGANIZATION_NAME	VARCHAR2	30		✓		

Fig.3.3.8 Participant Profile

Description:

In this table I am keeping additional information about a participant. Participant name is not a key issue for my system but it is good to have the information for future use. So does organization name.

3.3.4.2 Attendance System

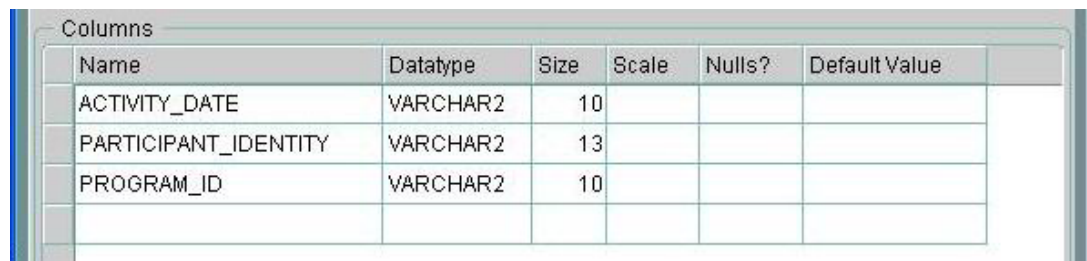
Table Name: Program Schedule

Purpose: Confirm the time of a class and keep such information.

Description: When a class is scheduled, other module of the system needs the information of such class. So I m keeping those class related information here in this table.

Table Name: Absentee List

Purpose: Identify the absentee participant.



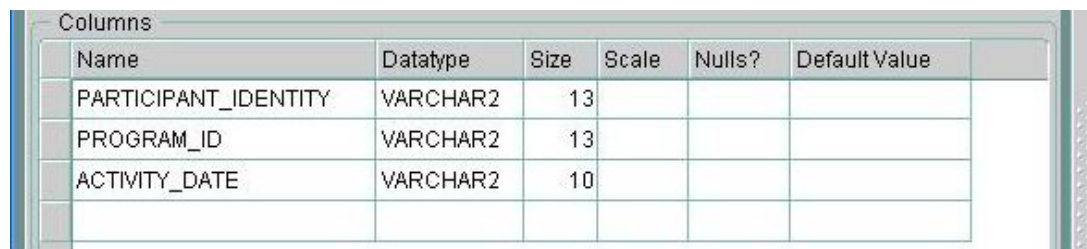
Name	Datatype	Size	Scale	Nulls?	Default Value
ACTIVITY_DATE	VARCHAR2	10			
PARTICIPANT_IDENTITY	VARCHAR2	13			
PROGRAM_ID	VARCHAR2	10			

Fig.3.3.9 Absentee List

Description: The table contains the absentee list of a particular class of a program. Other module of the system uses the absentee list while checking the validity of the input.

Table Name: Participant List

Purpose: keeps the participant list of a class.



Name	Datatype	Size	Scale	Nulls?	Default Value
PARTICIPANT_IDENTITY	VARCHAR2	13			
PROGRAM_ID	VARCHAR2	13			
ACTIVITY_DATE	VARCHAR2	10			

Fig.3.3.10 Participant List

Description: Question answer module needs to check valid participant list while checking the receiving answer. So this table always keeps information when a participant gives attendance through the mobile.

3.3.4.3 Login System:

Table Name: Login

Purpose: Keeps the information about user and their password.

Columns						
Name	Datatype	Size	Scale	Nulls?	Default Value	
USER_NAME	VARCHAR2	20				
USER_PASS	VARCHAR2	20		✓		
CON_PASS	VARCHAR2	20		✓		

Fig.3.3.11 Login

Description: The table keeps all users password of the system. It keeps in the encrypted form. So that nobody can figure out the password after a view of the data of this table.

3.4 Implementation

3.4.1 Registration system

After all the analysis and design my registration system will function like:

1. When a participant will seek for registration, it checks for program id in program details table. If not exists then give a notification message saying the program does not exists. If exists then check the starting date of the program with the current date. If current date is equal or greater than the class start date then it informs the participant that he/she is late for this time, may try next time.

2. After steps 1, registration system checks for participant name in the participant confirmation Table with respect of his/her mobile phone. If participant's name is not there then the system allows. If participant's name exists then check for the desired program Id. If the participant not listed for the specific program then the system allows. Otherwise the system identified the participant as an old participant for that specific program.

3. Afterwards, registration system checks for the seats available in program details table with current seats taken on running program table. If the seat is not totally vacant then checks for how many occupied. If within the specified range then system allows. Else apologize to the candidate and ask him/her to try next time.

4. Lastly checks in Participant profile if the candidate information is available there or not. If not then stored participant's general information. And finally stored the information in participant confirmation and running program. After all these steps registration system sends a confirmation message to successfully registered participant through SMS.

3.4.1.1 Parsing algorithm

1. *Data (String)*
2. *delimiter (String)*
3. *Token (String)*
4. *TEMP (String) as Variable*
5. *Pos (Integer) as Variable*
6. *While Data not NULL repeat step 14*
7. *TEMP = Data*
8. *pos = InString (TEMP, delimiter)*
9. *If pos < 1 Then pos = Len (TEMP) + 1*
10. *Token = Left\$(TEMP, pos - 1)*
11. *pos = Len(TEMP) - pos + 1 - Len(delimiter)*
12. *If pos < 1 Then*
13. *TEMP = NULL*
14. *Else*
15. *TEMP = Right\$(TEMP, pos)*
16. *End If*
17. *End Function*

3.4.2 Attendance system

1. Check for the valid participant in running program when ever a participant seeks for attendance. If the participant identification number exists there then the system allows for next step, else reply with a negative notification.

2. Then the attendance system checks for valid attendance time comparing that with the class start time in program schedule table. If response time of the participant is within desired time then system allows for next step, else notify the registered candidate with negative message.

3. After that the attendance system checks for Schedule Class in the absentee table with current date. As when ever the concern authority schedules a class, the entire valid participant list from running program comes to the absentee list. So if the class is not in the absentee table it means there is no schedule class. System notifies this message to the user.

4. If a class is scheduled then system checks for duplicate attendance in the absentee table. As when ever a participant seeks attendance, the name is deleted from absentee list. So if the participant is valid and is not in the absentee list, then he/she is attending the class. Therefore, participant is may be trying for duplicate attendance mark. So the system alerts the participant.

5. On the other hand if there is record for the specific participant in the absentee list then the record is deleted, as the participant is now present.

6. Finally after all checks the system Adds the attendance record to participant list table and also update the result of that specific participant in progress_report_2 table. System also sends an acceptance message for attendance

3.4.2.1 Pseudocode for checking attendance

```

1. Function Checktime()
2. RESPONSE HOUR =Token (Responsetime, ":")
3. RESPONSE MINUTE = Token (Responsetime, ":")
4. RESPONSE SECOND = Token (Responsetime, ":")
5. SCHEDULE HOUR = Token (Scheduletime, ":")
6. SCHEDULE MINUTE = Token (Scheduletime, ":")
7. SCHEDULE SECOND = Token (Scheduletime, ":")
8. If RESPONSE MINUTE < 50 Then
9. If SCHEDULE HOUR = RESPONSE HOUR And SCHEDULE
   MINUTE >= RESPONSE MINUTE And SCHEDULE MINUTE <=
   RESPONSE MINUTE + 10) Then
10. checktime = True
11. Else
12. checktime = False
13. End If
14. Elseif RESPONSE MINUTE >= 50 And SCHEDULE MINUTE >= 50
   Then
15. If SCHEDULE HOUR = RESPONSE HOUR And SCHEDULE MINUTE
   - 50 >= RESPONSE MINUTE - 50 And SCHEDULE MINUTE - 50 <=
   RESPONSE MINUTE - 50 + 10) Then

```

```

16. checktime = True
17. Else
18. checktime = False
19. End If
20. Elseif RESPONSE MINUTE >= 50 And SCHEDULE MINUTE < 50
    Then
21. If RESPONSE HOUR + 1 = SCHEDULE HOUR And SCHEDULE
    MINUTE <= RESPONSE MINUTE - 50
22. Then checktime = True
23. Else
24. checktime = False
25. End If
26. End If
27. End Function

```

3.4.3 Login system

1. Login system initially Checks for the valid user in the Login pass table during system login. If the user exists in the record then system allows for next step. Else deny the entrance.

2. Afterwards the system takes the given password, encrypts that and matches with Login pass table record for stored password.

3. If the password matches then allow entrance, else deny login and ask for careful typing during password input.

3.4.3.1 For password change

1. Take the new password and confirm new password given by the user and checks that if they are same. If they are same then allows for next step else truncate operation

2. Take the user name and search it in the Login table.

3 If the user exists then allow next step. Else exit.

4. If the users exists then checks the old password with given old password. If the password is wrong then truncate with warning message. Else change the password for that specific user.

3.4.3.2 Encryption function

1. *Sub Encrypt()*
2. *PASSWORD(String)*
3. *ENCRYPT(String)*
4. *Variable length*
5. *length = Len(ENCRYPT)*
6. *For Initial = 1 To Len(PASSWORD)*
7. *Character = Asc(Mid\$(ENCRPT, (Initial Mod length) - length * ((Initial Mod Length) = 0), 1))*
8. *Mid\$(PASSWORD, Initial, Length) = Chr\$(Asc(Mid\$(PASSWORD, Initial, Length)) Xor Character)*
9. *Next Initial*
10. *End Sub*

CHAPTER 4

SYSTEM TESTING

4.1 Unit Testing and Integration Testing

As I have put up three systems; Login system, Registration system and Attendance system, my modules are inter-related. Attendance system works based on the output information of registration system. If any one failed to register, no question of giving attendance in a class as he/she is not valid participant. So if I can prove that given sample data, if both systems individually work rightly then integration testing is successful.

Testing For Registration System

TESTER: Shoeb Ahmed Date: 01.12.2004

Objective

Ensure that the information proved by the user is correct and rightly used by the system.

Test Cases	Data Field	Value
1. 0171730911	Keyword.Prog ID.Name.Org	Reg.prog1.shoeb.BRAC
2. 0188042524	Keyword.Prog ID.Name.Org	Prog1.reg.shoeb.BRAC
3. 0188042525	Keyword.Prog ID.Name.Org	PROG1.reg.shoeb.BRAC
4. 0188042525	Keyword.Prog ID.Name.Org	REG.prog1.shoeb
5. 0191310810	Keyword.Prog ID.Name.Org	REG prog1 shoeb

Expected Result Notes

Test 1 and 4 are valid because they have right format. Organization name is optional. System is not case sensitive. 5 is invalid because "." Necessary for parsing. 2,3 are invalid.

Actual Result Notes

Test 1 and 4 accepted. Tests 2,3,5 were rejected with correct error message.

Testing For LOGIN System

TESTER: Shoeb Ahmed

Date: 28.11.2004

Objective

Ensure that the information proved by the user is correct and allow the right user to operate the system.

Test Cases	Data Field	Data Field	Data Field	Value Entered		
1. sms	Password	New Pass	Confirm Pass	sms		
2. razib	Password	New Pass	Confirm Pass	razib	sms1	sms1
3. sakih	Password	New Pass	Confirm Pass	sms1	sakih	sms1
4. khaleq	Password	New Pass	Confirm Pass	Khalea	sms2	sms2
5. shoeb	Password	New Pass	Confirm Pass	shoeb	sms3	sms3

Expected Result Notes

Test 1 is a request for entering into the system. As password is correct, it is valid. Tests 2, 3, 4, 5 are the request for password change. Test 2, and 5 are valid as they match with old password, and new password and confirm new passwords are same. Test 3 is invalid as old password is correct, but new password and confirms new password is not same. Test 4 is invalid as old current password was "khaleq" where as the user has given "Khaleq".

Actual Result Notes

Test 1,2 and 5 accepted. Tests 3,4 were rejected with correct error message.

Testing For Attendance System

TESTER: Shoeb Ahmed

Date: 04.12.2004

Objective

Ensure that the information proved by the user is correct and rightly used by the Attendance system.

Test Cases	Data Field	Value Entered
1. 0171730911	Keyword	attn
2. 0191310810	Keyword	ATTN.0188042524
3. 0188042525	Keyword	0188042525
4. 0191310810	Keyword	Attn
5. 0188042524	Keyword	Present

Expected Result Notes

Tests 1 and 2 are valid. Test 2 is tricky because here only the sending mobile will get attendance and 0188042524 will not get any mark for attendance. Tests 3 and 5 not a valid registered participant so will be ignored initially though "ATTN" keyword is must for attendance and not case sensitive Test 4 is a duplicate attendance and will be denied.

Actual Result Notes

Test 1 and 2 accepted. Tests 3,4,5 were rejected with correct error message.

4.2 System Testing

On 16th December, we tested the system at a coaching center in Dhanmondi. There we prearranged a class session to simulate our complete system. We, all four-group members mutually tested the system over there. Our respected advisor conducted a class and recorded the video first. Then we play that video and a group of participants follow that video as they were attending a live class. They were given some mobile phones to interact with the system. Thus we had our system testing and from there we have gathered ideas how organize the sequence of our entire Distance learning classroom system.

4.2.1 Manual of input/output

Registration system: It has one input and five either output according to the situation.

Input: reg.progx.shoeb.BRAC

Output: *"You have been successfully registered for PROG X"*

Output: *The program id does not exist; Please check whether your program is PROGX"*

Output: *"Your are too late for registration"*

Output: *"You have been already enlisted for PROGX"*

Output: *"Sorry no more seats available for this course; Try again next time "*

Attendance System: Attendance system has one input and five outputs according to the query by the participants.

Input: attn

Output: *"BRAVO you are the attentive student of this class"*

Output: *"You are Not Valid Participant"*

Output: *"You are too Early/Late for attending the class"*

Output: *"No scheduled Class"*

Output: *"You are already attending the class"*

Login System: The login system have two input and corresponding to that have six output according to the situation.

Input: Username: sms, password: sms

Input: Username: sms, Password: sms, Newpassword: smsgroup, Confirm Password: smsgroup.

Output: *"No User Exists"*

Output: *"Wrong password please check CAPS lock and try Again"*

Output: *"Type new password carefully"*

Output: *"No such user is exists"*

Output: *"Type user name and password properly"*

Output: *"Password changed successfully"*

4.2.4 Actual Input Output

Registration System:

Attendance System:

Login System:

Input:

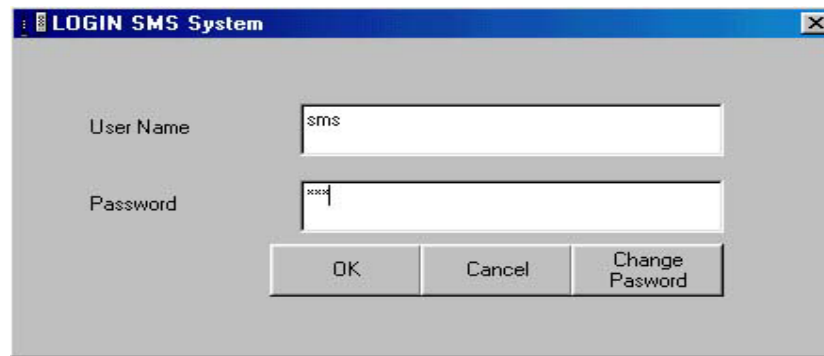


Figure 4.2.2(a) Login Input

Output:



Figure 4.2.2(b) Login output

4.3 Acceptance Testing

We have tested our Distance Learning (DL) system at BRAC University Savar residential campus (TARC). Doing so, we separated students who were taking MAT-101 into two groups. Each group was of 20 students. We gave a name to these two groups; one is f-2-f group another is SMS group. Our Advisor Dr. Yousuf M. Islam became the presenter and took a class on Quadratic functions. At the very beginning of the test we had taken a pretest. Both f-2-f and SMS groups sat together and gave the pretest. After the pretest, they were taken to two different adjacent classrooms. One group was face-to-face to the presenter (a usual face-to-face class situation) and the other group joined through live Telecast (they could see the presenter on the projector screen in the next room). Each of the student of SMS group was equipped with a mobile phone i.e. our proposed solution.

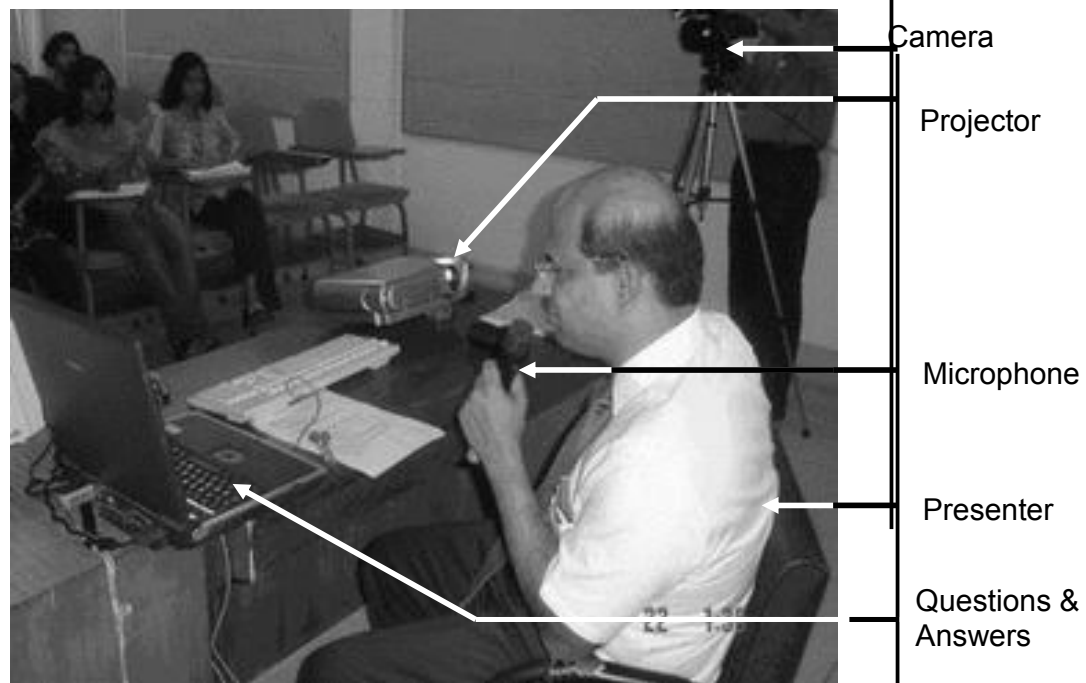


Figure 4.3 Presenter delivering his speech to both of the groups



Answering
Qs on
paper

z`Figure 4.3.1 Face to face participants are in the class

The figure 4.3 shows the presenter delivering his speech in the face-to-face classroom and this speech was broadcast to other classroom through a camera. Figure 4.3.1 shows the group of participants who joined face-to-face classroom. The participants can see and listen to the presenter directly face to face (usual class room situation). They can ask questions directly to the presenter.



Figure: 4.3.2 Face to face participant are writing class notes and the answers to question on paper.

The figure 4.3.2 shows the group of participants who joined the class in a face-to-face classroom. The participants are taking class notes and writing down the questions answers that are shown in the class. The presenter had no way of monitoring whether they are actually answering the questions.

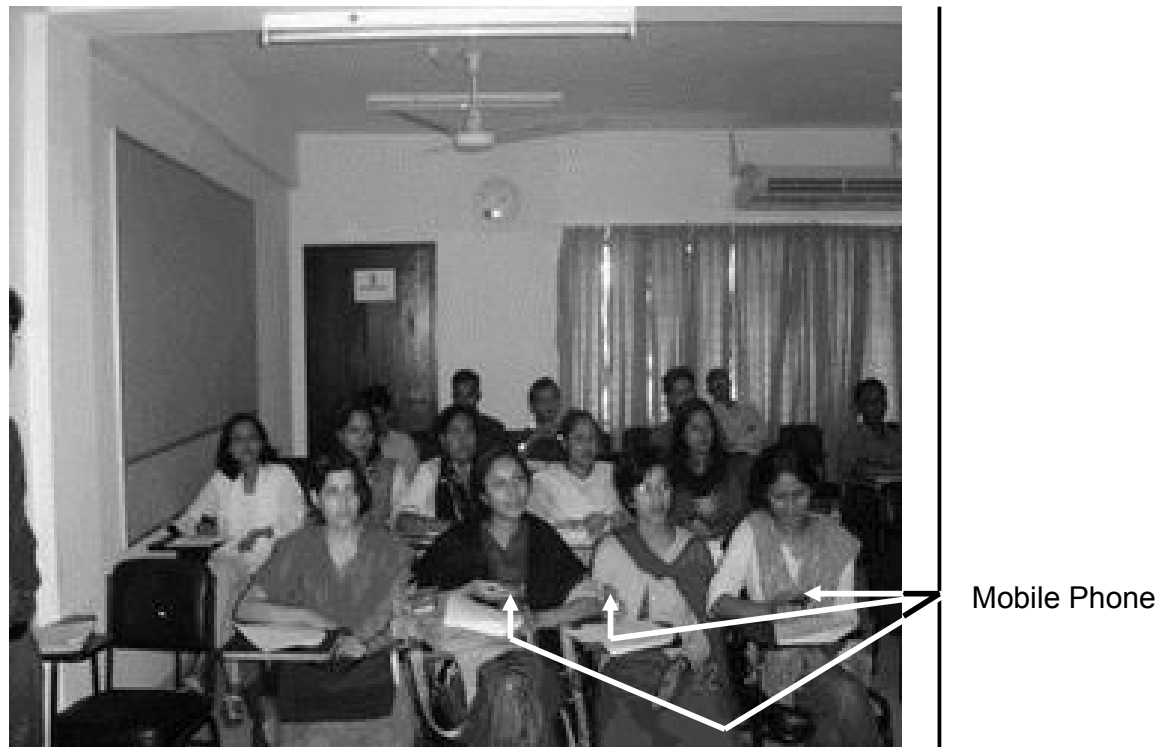


Figure: 4.3.3 Mobile-User participants are in the class in the other room.

The figure 4.3.3 shows the group of participants who joined the class from through Mobile phones. They are in other classroom (distance learning class room).

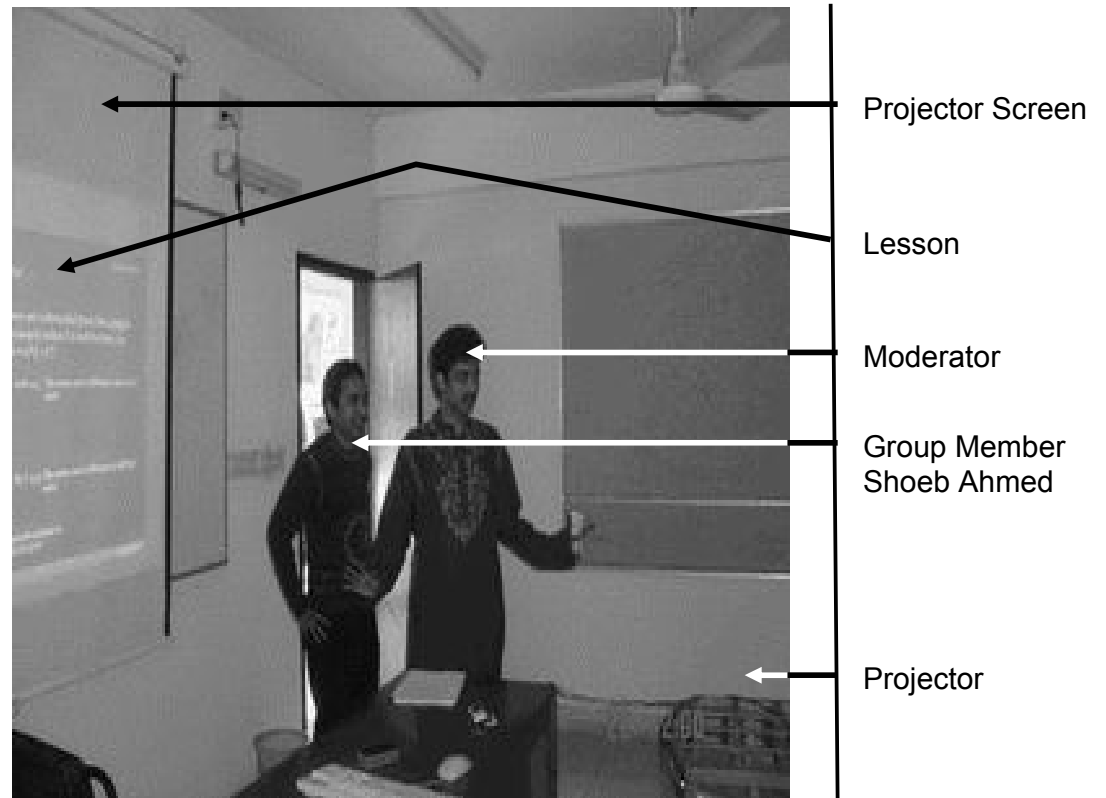


Fig.4.3.4 Projector screen for distance learners (Television Screen).

The figure 4.3.4 shows the projector screen on which the students see the presenter, power point displays and the questions. Our Moderator Mr. Zillur Rahman and one of the team member's Shoeb Ahmed are observing the class.



Fig.4.3.5 Mobile user participants are sending their answers via SMS

The figure 4.3.5 shows participants sending answers through SMS. They have an instruction sheet [\[User Manual\]](#) on how to send answers.



Fig.4.3.6 Live Conversation

Using our proposed system, presenter interacts directly with participant real time through mobile phone. Computer randomly selects a participant from the participant lists found from the Graph chart system and then asks the

participant the reason for choosing an answer. The Figure 4.3.6 shows the real time conversation between presenter and a participant.



Group Member
Khalequzzaman

Fig.4.3.7 One of our group members administrates our system.

4.4 Test data

As I have discussed earlier, our acceptance testing will be theoretically a beta testing and all the data we will use here will be real life user data.

Program Information:

As we have chosen Mat 101 student for the system, we have selected Quadratic Function as the program of our system. Which had taken by our Advisor.

PROGRAM_ID	PROGRAM_NAME	ORGANIZATION_NAME
PROG1	Quadratic Function	BRAC University

Program Details:

As it was a daylong program so we just formally declare the duration of the course and total participant number before we start our test.

PROGRAM ID	START DATE	END DATE	PROGRAM DURATION	NO. OF PARTICIPANT
PROG1	22-Dec-2004	22-Dec 2004	1	25

Presenter Profile:

Our respected Advisor was kind enough to be the presenter for the first time and thus helped us to complete the testing.

Presenter ID	Presenter Name	Presenter Address	Presenter E-mail	Presenter Contact No
SP1	Dr. Yousuf M. Islam	Gulshan - 2	yislam@bracuniversity.net	9881265, EXT-434

Program Schedule:

The following data were entered into the program schedule table to confirm the program timing.

PROGRAM ID	ACTIVITY DATE	PROGRAM CONFIRMATION	SPEAKER ID	SPEAKER CONFIRMATION	PROGRAM START TIME	PROGRAM END TIME
PROG1	12/22/2004	Yes	SP1	Yes	13:29:00	14:10:00

List of registered participants:

After the formal procedure, SMS participants seek for registration through SMS. They have successfully registered and we start our testing with the following participants.

PARTICIPANT_IDENTITY	PARTICIPANT_NAME	ORGANIZATION_NAME
+880172844972	UMMAY HUMAYRA	BRAC University
+880172720366	TAHIA KHAIR	BRAC University
+880176412311	SHAMIUL ISLAM	BRAC University
+880172849812	SHAHIDA CHOWDHURY	BRAC University
+880171288829	TONIMA AZAM	BRAC University
+880176835595	NAZIFA TASNIM	BRAC University
+880172105137	ZAHID ISLAM	BRAC University
+880172696308	ISHFAQ	BRAC University
+880172832211	SHORAB	BRAC University
+880176552088	RIDWANA E REJINA	BRAC University
+880189405131	SAJJAD AHMED	BRAC University
+880172977503	EVANA	BRAC University
+880189502590	MD KAMRUZZAMAN	BRAC University
+880171876909	MD ISHRAT JAMIL	BRAC University
+880172823901	KHAIRUL BASAR	BRAC University
+880189419681	RUBAMA AHMED NIRU	BRAC University
+880172230474	FATEMA AKTER SUMI	BRAC University
+880173013365	MITU	BRAC University
+880176593790	ISHTIAQ	BRAC University
+880172798525	AMITABH	BRAC University
+880176484892	SHAMIMA SIDDIQUA	BRAC University

4.5 Question Bank

The following questions were asked during the class on Quadratic Functions.

Q1. What do a satellite dish and the mirror of a car headlight have in common?

- a. They are circular in shape.
- b. They are parabolic in shape.
- c. They have a square cross-section.
- d. Their shape is unknown

Answer: Q1b

Q2. Which of the following subjects tells us why we need a parabolic shape for the satellite dish and for the mirror of a car headlight?

- a. Mathematics
- b. Biology
- c. Physics
- d. English Language

Answer: Q2C

Q3. On normal paper that we use, i.e. in a plane, how can we best describe complete curved lines or shapes?

- a. By using a series of X, Y coordinates
- b. By drawing a curved line
- c. Using X and Y axis
- d. By describing the curved line verbally

Answer: Q3A

Q4. A formula given in terms of X is sometimes called a function of X or $f(x)$. Which of the following function does not describe a curved line?

- a. $f(x) = x^3 + x^2 + 2x + 1$
- b. $f(x) = x^2 + 2x + 1$
- c. $f(x) = x$
- d. $f(x) = x^2 + 1$

Answer: Q4C

Q5. The simplest Parabola is described by the following function

- a. $f(x) = x^2 + 2x + 1$
- b. $f(x) = x^2$
- c. $f(x) = 4x^2 + x + 3$
- d. $f(x) = 2x + 1$

Answer: Q5B

Q6. How can we find out what a particular function of x or $f(x)$ looks like?

- a. By estimating or approximating the curve
- b. By plotting the x and y axis
- c. By working out the minimum and maximum value of $f(x)$
- d. By working out the value of $f(x)$ for a range of x values and plotting the x and corresponding $f(x)$ values

Answer: Q6D

Q7. When $f(x) = x^2$, what is the value of $f(x)$ when $x = 3$?

- a. 4
- b. 9

- c. 6.25
- d. 2.25

Answer: Q7B

Q8. What is the value of x and $f(x)$ at the lowest points shown on the graph?

- a. -1, 1 and 1, 1
- b. -0.5, 0.25 and 0.5, 0.25
- c. -0.25, 0.25 and 0.25, 0.25
- d. None of the above

Answer: Q8B

Q9: What is the minimum value of the simplest parabola?

- a. 3
- b. 0
- c. -3
- d. 0.5

Answer: Q9B

Q10. What would happen if terms are subtracted from the simple function $f(x) = x^2$, for example when 3 is subtracted, i.e. when the function is $f(x) = x^2 - 3$?

- a. The entire curve will move up by 3 units
- b. The entire curve will move to right by 3 units
- c. The entire curve will move down by 3 units
- d. The entire curve will move to left by 3 units

Answer: Q10C

Q11. When the coefficient $a=-1$, each value of x^2 will be multiplied by -1 . The resulting curve will:

- a. Move down by -1 and have a minimum at $f(x) = -1$.
- b. Be a mirror image of $f(x) = x^2$ around the x -axis with a maximum value at $f(x) = 0$.
- c. Shift to the left by -1 and have a minimum at $f(x) = 0$.
- d. Shift to the right by 1 and have a minimum at $f(x) = 0$.

Answer: Q11A

Q12. When the coefficient $|a| > 1$, x^2 would increase for each value of x , therefore the curve

- a. Will be sharper with the max / min still at $f(x) = 0$.
- b. Will move up by the value of " a " and the minimum at $f(x) = a$.
- c. Will move down by the value of " a " and the minimum at $f(x) = a$.
- d. Will invert and have a maximum value at $f(x) = a$.

Answer: Q12B

4.6 Results:

As discussed before, we arranged a test (pre-test) for both of the face-to-face and mobile user participants. We tested them on 10 questions. We categorized them as Bangla medium and English medium participants. After the end of the class we also arranged another test (post-test) for both group with the same questions. And then we evaluated their tests. The following table contains the evaluation sheet of pre-test and post-test.

Evaluation Sheet of Pre-test and Post-test.

Interactive Distance Education Using SMS Evaluation Research						
		Marks out of 6	Eng Med	Bang Med	Eng Med	Bang Med
Section 1			Face to Face		Face to Face	
SI #	Student ID	Name	Pre-test		Post-test	
1	04304067	Md. Showkat Ali		1		4
2	04303008	Jhumoor		0		3
3	04303004	Nazma Akter		0		5
4	04304010	Md. Zakir Hossain		1		3
5	04304025	Istiaq Ahmed		0		2.5
6	04304088	Nusrat Farzana		1		4.25
7	04304087	Sumayla Nahrin		0		4.25
8	04304097	Md. Moniruzzaman		1.5		4
9	04304099	Khorshed Alam		1.5		2
10	04304038	Faria Rafiq		0		3
11	04304034	Zahid		1		3
12	04304089	Tahsin Rahman		0		2.5
13	04304043	Md. Arif Hossain		0		2
14	04304064	Md. Anamul Hasan		1		3
15	04303005	Nadia Saleh		2		4.25
16	04304047	Faria Afsana		1		3

17	04305003	Nusrat Nadia		1		3
18	04304048	Rajib Kumar Cahda		2		1
19	04304029	Shamir		1		4.5
20	04304052	Md. Imran Khan		1		5
			SMS		SMS	
Section 2			Pre-test		Post-test	
1	04304030	Rubana Ahmed Niru		1		5
2	04304066	Md. Shamiul Islam				
3	04304040	Shoeb Ahmed				
4	04304045	Nahid Raja Tina		1		1
5	04303003	Tonima Azam		0		4
6	04304014	Fatema Akter Sumi		0		5
7	04304020	Shumaisa Tameem		0		5
8	04303002	Nazifa Tamim		0		5.5
9	04309003	Ummay Humayra Rumana		0		5.5
10	04302049	Shamima Siddiqua		0		5.5
11	04304073	Ishrat Jamil		1		3
12	04303001	Tahia Khair		1.5		5.5
13	04303006	Shahida Chowdhury		1		5.5
14	04309002	S.M. Kamrul Bahar		0		3
15	04305002	Sajjad Ahmed		1.5		3.25
16	04304016	Israt Jahan		1		5
17	04304081	Mehboob Hafiz		1		5
18	04304021	Md. Kamruzzaman		0		5
40	04304056	Md. Shorab Hossain		0		5
19	04304051	Ridwana-E-Rejina		1		3
20	04304017	Ishtiaque Ahmed Mallick		0		1

Pre-test:

➤ Face-to-face Group

We have a total marks of 6. On face-to-face Pre test there is no English medium participant. Seven people did not get any mark. Out of 6 the average mark is 0.8.

➤ SMS Group:

Ten people did not get any mark. Out of 6 the average mark is 0.5

Post-test:

➤ Face-to-Face Group

We have total marks of 6. At post-test their performance is better from pre-test. Out of 6 the average mark is 3.24.

➤ SMS Group

Out of 6 the highest mark is 5.5 and average mark is 3.60.

For system testing we tested the performance of the entire system with actual classroom data. Performance testing determines how the system performs on the range of possible environments in which it may be used. For testing whether the proposed distance learning system was effective we evaluate pre-test and post-test for both the face-to-face and the Distance Learning class. A T-test was used to compare the results both systems of teaching.

4.7 T-Test Analysis

We test the hypothesis that “there is no true difference between the two means” (NULL hypothesis). We have used MATLAB as the test-tool through the following command:

```
[h, significance,ci] = ttest2(x,y,alpha)
```

Here the '**alpha**' is related to the degree of certainty we require in order to reject the null hypothesis in favor of the alternative. Using this we decide in advance to reject the null hypothesis if the probability of observing your sampled result is less than the significance level. For a typical significance level of 5%, the notation is $\alpha = 0.05$. For this significance level, the probability of incorrectly rejecting the null hypothesis when it is actually true is 5%. If we need more protection from this error, and then choose a lower value of alpha.

The '**significance**' (**p-value**) is the probability of observing the given sample result under the assumption that the null hypothesis is true. If the significance (p-value) is less than alpha, then we reject the null hypothesis.

4.7.1 PRE TEST:

```
» x=load ('preface2face.txt');
```

```
» y=load ('presms.txt');
```

```
» mean(x)-mean(y)
```

```
ans = 0.2737
```

```
» [h, significance, ci] =ttest2(x, y, 0.05)
```

```
h =0
```

```
Significance = 0.1870
```

```
ci = -0.1387 0.6861
```

The result, $h = 0$, means that we cannot reject the null hypothesis. The significance is 0.1870, which means that by chance we would have observed values of t more extreme than the one in this example in 1870 of 10,000 similar experiments! A 95% confidence interval on the mean is $[-0.1387, 0.6861]$, which includes the theoretical (and hypothesized) difference of

0.1870.

4.7.2 POST TEST:

```
» x=load ('face2face.txt');
```

```
» y=load ('sms.txt');
```

```
» [h, significance, ci]=ttest2(x,y,0.01)
```

```
h = 0
```

```
Significance = 0.0274
```

```
ci = -2.0463  0.1713 ..... (0)
```

```
» [h, significance, ci] =ttest2(x, y, 0.02)
```

```
h = 0
```

```
Significance = 0.0274
```

```
ci = -1.9303  0.0553 ..... (1)
```

```
» [h, significance, ci]=ttest2(x,y,0.03)
```

```
h = 1
```

```
Significance = 0.0274
```

```
ci = -1.8591  -0.0159 ..... (2)
```

```
» [h, significance, ci] =ttest2(x, y, 0.05)
```

$h = 1$

Significance = 0.0274

ci = -1.7649 -0.1101 (3)

From (0) & (1) where 'alpha' = 0.02, the result, $h = 0$, means that we cannot reject the null hypothesis. The significance is 0.0274, which means that by chance we would have observed values of t more extreme than the one in this example in only 274 of 10,000 similar experiments! From (1) a 95% confidence interval on the mean is [-1.9303, 0.0553], which includes the theoretical (and hypothesized) difference of -0.9375

From (2) & (3) where 'alpha' = 0.03 or more, the result, $h = 1$, means that we can reject the null hypothesis. The significance is 0.0274, which means that by chance we would have observed values of t more extreme than the one in this example in only 274 of 10,000 similar experiments! In (3), a 95% confidence interval on the mean is [-1.7649,-0.1101], which includes the theoretical (and hypothesized) difference of -0.9375.

CHAPTER 5

USER MANUAL

5.1 User Instructions for Distance Learners

5.1.1 Program Information System

This module keeps program information. If a participant wants to know about any particular program, he/she has to send a SMS as like:

info<dot> Program id (Not Case Sensitive but no space)

info.progX	0171730911
SMS Message	Destination number

The return message gives the particular program information.

5.1.2 Participant registration system

Participant has to complete his/her registration before the start of a program. The Participant has to send his/her details with program id. The SMS format is:

Reg<dot>program id<dot>Participant name<dot>Organization name

Reg.progX.Name.BRAC	0171730911
SMS Message	Destination number

Note that, here a participant can give space between his/her first and last name. But except that no space is allowed.

5.1.3 Attendance system

The attendance system takes individual participant's attendance. When a session start the Participant has to send a SMS within next 10 minutes. The SMS format for attendance as:

Attn(Not case Sensitive but no space)

attn	0171730911
SMS Message	Destination number

Then the attendance system will reply a confirmation message, as "BRAVO you are the attentive participants in the class".

CONCLUSION

The primary role of the student is to learn. However, monitoring of the learning process during the progress of a class is difficult. So by establishing a Virtual Interactive Class room /Meeting we can provide a better monitoring for a large number of students of our country. So our project focus to establish a Virtual class room for students to get proper education from qualified and experience teacher. It will also help participants to increase their concentration and participate in the classroom attentively.

From our research we found that the results of the Distance Learning (DL) participants are at least the same as face-to-face participants. At the beginning of the test (pre-test) we found that the face-to-face participant's average mark was 0.8 out of 6 and the DL groups average mark was 0.5. After taking the post-test at the end of the live test the face-to-face participant's average mark was 3.24 and on other hand the DL group's average mark was 3.6 out of 6. So we can say that for a certain cost a large number of participants can get the opportunity for better education from qualified and experience presenter (teacher). The participants do not need to come to a on campus classroom; they can attend this class from their home or rural village. So our proposed DL system will save more time and expenditure for the participants.

Finally, due to availability and access of modern technology, TV DL can take advantage of the concepts tested in the thesis.

REFERENCES

- [1] Yousuf M. Islam, PhD, Mawdudur Rahman, PhD and Mr. Manzur Ashraf."Mobile Telephone technology as a distance learning tool", (to be published),
- [2] Jeffry A. Hoffer,Joey F. GeorgeModern system Analysis & Design.Pearson Education Asia.
- [3] Alan Dennis, Indiana University.Barbara Haley Wixom, University of Virginia.David Tegarden, Virginia Tech. System Analysis and Design
- [4] Mawdudur Rahman, Nishikant Sonwalkar."Multidimensional assessment of online learning –A pilot study".

APPENDICES

Incoming Message Log

The following table contains the incoming messages, which are sent by the participants. The shaded messages shown are from the modules that were developed by me.

Mobile Number	Date	Time	Message
+880171442013	22/12/04	01:27:54	info.prog1
+880188042525	22/12/04	01:30:10	Info.prog1
+880171442013	22/12/04	01:31:27	info.prog1
+880172961628	22/12/04	01:35:50	Reg.prog1.k.i
+880171442013	22/12/04	01:36:01	reg.proG1.ZAMAN.BU
+880172961628	22/12/04	01:43:44	Attn
+880171442013	22/12/04	01:43:48	attn
+880188042524	22/12/04	12:20:20	info.prog1
+880172105137	22/12/04	12:54:37	info.prog1
+880172961628	22/12/04	13:15:58	Info.prog1
+880172844972	22/12/04	13:16:23	Reg.prog1. Ummay humayra.BRAC
+880172720366	22/12/04	13:16:24	Reg.prog1.Tahia khair.BRAC
+880176412311	22/12/04	13:16:54	Reg.prog1.Shamiul Islam.BRAC
+880172849812	22/12/04	13:16:55	Reg.prog1.shahida chowdhury.brac
+880171288829	22/12/04	13:16:58	Reg.Prog1.Tonima azam.Brac
+880176835595	22/12/04	13:17:03	Reg.prog1.Nazifa Tasnim.BRAC
+880172105137	22/12/04	13:17:32	Reg.prog1.ZAHID ISLAM.BRAC
+880172696308	22/12/04	13:17:38	Reg.Prog1.Ishfaq.BRAC
+880172832211	22/12/04	13:18:12	Reg.prog1.shorab.BRAC
+880172230474	22/12/04	13:18:33	Reg.prog.Fatema Akter Sumi.BRAC
+880176552088	22/12/04	13:18:54	Reg.prog1.RIDWANA E REJINA.BRAC

+880189405131	22/12/04	13:17:59	Reg.Prog1.Sajjad Ahmed.BRAC
+880172977503	22/12/04	13:19:03	Reg.prog1.evana.BRAC
+880189502590	22/12/04	13:18:18	REG.PROG1.MD KAMRUZZAMAN.BRAC
+880171876909	22/12/04	13:19:22	Reg.prog1.Md Ishrat jamil.BRAC
+880172823901	22/12/04	13:19:27	Reg.prog1.khairul basar.BRAC
+880189419681	22/12/04	13:18:51	Reg.prog1.rubama ahmed niru.brac
+880172230474	22/12/04	13:20:08	Reg.prog1.Fatema Akter Sumi.BRAC
+880171876909	22/12/04	13:20:29	Reg.prog1
+880173013365	22/12/04	13:20:56	Reg.Prog1.Mitu
+880176412311	22/12/04	13:22:39	attn
+880172105137	22/12/04	13:22:45	attn
+880172849812	22/12/04	13:22:55	Attn
+880176552088	22/12/04	13:22:57	attn
+880171876909	22/12/04	13:23:20	Attn
+880172230474	22/12/04	13:23:30	attn
+880173013365	22/12/04	13:23:46	Attn
+880172977503	22/12/04	13:23:46	attn.h1a
+880172696308	22/12/04	13:23:49	Attn
+880172832211	22/12/04	13:23:55	attn
+880172823901	22/12/04	13:23:59	Attn
+880176835595	22/12/04	13:24:12	attn
+880176593790	22/12/04	13:25:33	Reg.prog1.ishtiaq.brac
+880172720366	22/12/04	13:26:25	attn
+880172696308	22/12/04	13:26:26	Attn
+880172844972	22/12/04	13:26:31	Attn
+880171876909	22/12/04	13:26:38	Attn
+880176552088	22/12/04	13:26:41	attn
+880176412311	22/12/04	13:26:43	attn
+880172230474	22/12/04	13:26:48	attn

+880172798525	22/12/04	13:26:53	Reg.prog1.amitabh.BRAC
+880173013365	22/12/04	13:26:54	Attn
+880172832211	22/12/04	13:26:57	attn
+880172977503	22/12/04	13:26:59	attn
+880176835595	22/12/04	13:27:36	attn
+880172105137	22/12/04	13:28:35	attn
+880171876909	22/12/04	13:28:37	Attn
+880189502590	22/12/04	13:22:59	ATTN
+880172720366	22/12/04	13:30:00	q1b
+880176552088	22/12/04	13:30:02	q1b
+880172798525	22/12/04	13:30:17	Attn
+880172832211	22/12/04	13:30:17	q1b
+880172696308	22/12/04	13:30:31	Q1b
+880171876909	22/12/04	13:30:32	Q1b
+880172977503	22/12/04	13:30:40	Q1b
+880176412311	22/12/04	13:30:45	q1a
+880172105137	22/12/04	13:30:46	q1b
+880172798525	22/12/04	13:30:54	Attn
+880176835595	22/12/04	13:30:55	Q1b
+880172844972	22/12/04	13:31:00	Q1b
+880173013365	22/12/04	13:31:25	Attnq1a
+880172823901	22/12/04	13:31:48	q1b
+880176593790	22/12/04	13:31:49	B
+880172230474	22/12/04	13:31:51	Q1.d
+880172798525	22/12/04	13:32:34	Q1.b
+880172823901	22/12/04	13:33:38	Attn
+880189502590	22/12/04	13:25:45	ATTN
+880176593790	22/12/04	13:34:10	Q2c
+880172720366	22/12/04	13:34:11	q2c
+880176552088	22/12/04	13:34:13	q2c
+880172798525	22/12/04	13:34:14	Q2c
+880172105137	22/12/04	13:34:14	q2c

+880173013365	22/12/04	13:34:18	Q2c
+880176412311	22/12/04	13:34:20	q2c
+880176835595	22/12/04	13:34:23	Q2c
+880172230474	22/12/04	13:34:24	Q2c
+880172696308	22/12/04	13:34:25	Q2c
+880171876909	22/12/04	13:34:31	Q2c
+880172977503	22/12/04	13:34:33	Q2c
+880172832211	22/12/04	13:34:34	q2c
+880172696308	22/12/04	13:34:34	Q2c
+880172823901	22/12/04	13:34:46	Q2c
+880172977503	22/12/04	13:34:59	Q2c
+880172230474	22/12/04	13:35:08	Q2c
+880176552088	22/12/04	13:37:06	q3c
+880173013365	22/12/04	13:37:15	Q3c
+880172696308	22/12/04	13:37:16	Q3a
+880171876909	22/12/04	13:37:23	Q3c
+880172720366	22/12/04	13:37:24	q3c
+880172230474	22/12/04	13:37:27	Q3c
+880176835595	22/12/04	13:37:29	Q3c
+880172798525	22/12/04	13:37:30	Q3b
+880172977503	22/12/04	13:37:39	Q3b
+880172105137	22/12/04	13:37:42	q3c
+880172832211	22/12/04	13:37:43	q3a
+880172844972	22/12/04	13:37:43	Q3c
+880172823901	22/12/04	13:37:51	Q3a
+880176412311	22/12/04	13:38:42	q3d
+880176593790	22/12/04	13:38:57	Q3D
+880176484892	22/12/04	13:39:13	Reg.prog1.Shamima Siddiqua.BRAC
+880176484892	22/12/04	13:43:12	attn
+880188042524	22/12/04	13:26:02	attn
+880172696308	22/12/04	13:43:59	Q4c

+880173013365	22/12/04	13:44:00	Q4C
+880172977503	22/12/04	13:44:04	Q4c
+880176552088	22/12/04	13:44:09	q4d
+880176412311	22/12/04	13:44:13	q4d
+880172105137	22/12/04	13:44:14	Q4d
+880172720366	22/12/04	13:44:15	q4c
+880172823901	22/12/04	13:44:19	Q4b
+880176593790	22/12/04	13:44:20	Q4C
+880172832211	22/12/04	13:44:23	q4b
+880172230474	22/12/04	13:44:26	Q4c
+880176835595	22/12/04	13:44:33	Q4c
+880171876909	22/12/04	13:44:37	Q4c
+880172844972	22/12/04	13:44:46	Q4c
+880176484892	22/12/04	13:44:59	attn
+880172696308	22/12/04	13:47:44	Q5b
+880172105137	22/12/04	13:47:46	Q5b
+880172720366	22/12/04	13:47:46	q5b
+880172977503	22/12/04	13:47:48	Q5b
+880173013365	22/12/04	13:47:49	Q5B
+880176835595	22/12/04	13:47:52	Q5b
+880172798525	22/12/04	13:47:57	Q5b
+880172823901	22/12/04	13:47:58	Q5b
+880176412311	22/12/04	13:47:58	q5b
+880172844972	22/12/04	13:48:02	Q5b
+880176552088	22/12/04	13:48:03	q5b
+880176484892	22/12/04	13:48:08	q5b
+880172832211	22/12/04	13:48:12	q5b
+880171876909	22/12/04	13:48:15	Q5b
+880176593790	22/12/04	13:48:41	Q5B
+880171876909	22/12/04	13:48:51	Q5b
+880176593790	22/12/04	13:52:01	ATTN
+880173013365	22/12/04	13:53:01	Q8d

+880172696308	22/12/04	13:53:36	Q8d
+880189405131	22/12/04	13:27:01	Attn
+880189502590	22/12/04	13:27:13	ATTN
+880176412311	22/12/04	13:53:47	q8c
+880176835595	22/12/04	13:53:49	Q8c
+880172105137	22/12/04	13:53:58	Q8c
+880172720366	22/12/04	13:53:59	q8c
+880176552088	22/12/04	13:54:00	q8c
+880176593790	22/12/04	13:54:04	Q8C
+880172977503	22/12/04	13:54:16	Q8b
+880171876909	22/12/04	13:54:19	Q8c
+880172696308	22/12/04	13:58:05	Q10c
+880172696308	22/12/04	13:58:22	Q10c
+880176412311	22/12/04	13:58:30	q10c
+880172720366	22/12/04	13:58:31	q10c
+880172696308	22/12/04	13:58:31	Q10c
+880172977503	22/12/04	13:58:32	Q10c
+880173013365	22/12/04	13:58:34	Q10c
+880172832211	22/12/04	13:58:35	q10c
+880172844972	22/12/04	13:58:37	Q10c
+880176552088	22/12/04	13:58:39	q10c
+880172105137	22/12/04	13:58:39	Q10c
+880176835595	22/12/04	13:58:50	Q10c
+880176593790	22/12/04	13:59:20	Q9C
+880171876909	22/12/04	13:59:48	Q10c
+880189502590	22/12/04	13:29:47	Q1B

Sending Message Log

The following table contains the messages that were sent by the Question Answer System. The shaded messages were sent to the participants automatically by the question answer system.

880171442013	12/22/2004 01:28:38 AM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880188042525	12/22/2004 01:31:32 AM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880171442013	12/22/2004 01:31:38 AM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880172961628	12/22/2004 01:35:57 AM "You have been successfully registered for PROG1" OLE: Send_Message
880171442013	12/22/2004 01:36:08 AM "You have been successfully registered for PROG1" OLE: Send_Message
880171442013	12/22/2004 01:40:34 AM "Quadratic Function class is about to start within 10 minutes" OLE: Send_Message
880172961628	12/22/2004 01:40:40 AM "Quadratic Function class is about to start within 10 minutes" OLE: Send_Message
880172961628	12/22/2004 01:43:50 AM "BRAVO you are the attentive student of this class" OLE: Send_Message
880171442013	12/22/2004 01:43:56 AM "BRAVO you are the attentive student of this class" OLE: Send_Message
880171442013	12/22/2004 01:50:46 AM "You Did not attempted Ques No 5" OLE: Send_Message
880188042524	12/22/2004 12:21:25 PM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880172961628	12/22/2004 01:16:04 PM "Quadratic Function , Start: 12/22/2004, End: 12/22/2004, 1 Lectures" OLE: Send_Message
880172844972	12/22/2004 01:16:26 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172720366	12/22/2004 01:16:37 PM "You have been successfully

registered for PROG1" OLE: Send_Message
880176412311 12/22/2004 01:17:20 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172849812 12/22/2004 01:17:30 PM "You have been successfully registered for PROG1" OLE: Send_Message
880171288829 12/22/2004 01:17:49 PM "You have been successfully registered for PROG1" OLE: Send_Message
880176835595 12/22/2004 01:18:05 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172105137 12/22/2004 01:18:12 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172696308 12/22/2004 01:18:20 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172832211 12/22/2004 01:18:33 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172230474 12/22/2004 01:18:45 PM "The program id does not exit;please check whether your program is PROG" OLE: Send_Message
880176552088 12/22/2004 01:18:59 PM "You have been successfully registered for PROG1" OLE: Send_Message
880189405131 12/22/2004 01:19:15 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172977503 12/22/2004 01:19:52 PM "You have been successfully registered for PROG1" OLE: Send_Message
880189502590 12/22/2004 01:20:19 PM "You have been successfully registered for PROG1" OLE: Send_Message
880171876909 12/22/2004 01:20:37 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172823901 12/22/2004 01:20:46 PM "You have been successfully registered for PROG1" OLE: Send_Message
880189419681 12/22/2004 01:20:52 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172230474 12/22/2004 01:21:04 PM "You have been successfully

registered for PROG1" OLE: Send_Message
880171876909 12/22/2004 01:21:30 PM "You have been already enlisted for PROG1" OLE: Send_Message
880173013365 12/22/2004 01:21:37 PM "You have been successfully registered for PROG1" OLE: Send_Message
880176412311 12/22/2004 01:22:54 PM "You are too late for attending the class" OLE: Send_Message
880172105137 12/22/2004 01:23:27 PM "You are too late for attending the class" OLE: Send_Message
880172849812 12/22/2004 01:23:34 PM "You are too late for attending the class" OLE: Send_Message
880176552088 12/22/2004 01:23:41 PM "You are too late for attending the class" OLE: Send_Message
880171876909 12/22/2004 01:23:48 PM "You are too late for attending the class" OLE: Send_Message
880172696308 12/22/2004 01:28:01 PM "You are too late for attending the class" OLE: Send_Message
880172832211 12/22/2004 01:28:12 PM "You are too late for attending the class" OLE: Send_Message
880172823901 12/22/2004 01:28:17 PM "You are too late for attending the class" OLE: Send_Message
880172823901 12/22/2004 01:28:17 PM "You are too late for attending the class" OLE: Send_Message
880176593790 12/22/2004 01:29:34 PM "You have been successfully registered for PROG1" OLE: Send_Message
880172720366 12/22/2004 01:30:43 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172696308 12/22/2004 01:31:28 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172844972 12/22/2004 01:31:34 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880171876909 12/22/2004 01:31:43 PM "BRAVO you are the attentive

student of this class" OLE: Send_Message
880176552088 12/22/2004 01:31:53 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880176412311 12/22/2004 01:32:00 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172230474 12/22/2004 01:32:07 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172798525 12/22/2004 01:32:13 PM "You have been successfully registered for PROG1" OLE: Send_Message
880173013365 12/22/2004 01:32:20 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172832211 12/22/2004 01:32:27 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172977503 12/22/2004 01:32:35 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880176835595 12/22/2004 01:32:44 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172105137 12/22/2004 01:32:51 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880171876909 12/22/2004 01:32:58 PM "You are already attending the class" OLE: Send_Message
880189502590 12/22/2004 01:33:52 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880172798525 12/22/2004 01:34:52 PM "You are already attending the class" OLE: Send_Message
880172798525 12/22/2004 01:35:30 PM "You are already attending the class" OLE: Send_Message
880172823901 12/22/2004 01:35:53 PM "You are absent for today" OLE: Send_Message
880172230474 12/22/2004 01:36:00 PM "You Did not attempted Ques No 1" OLE: Send_Message
880173013365 12/22/2004 01:36:07 PM "You Did not attempted Ques No

1" OLE: Send_Message
880189502590 12/22/2004 01:36:13 PM "You Did not attempted Ques No 1" OLE: Send_Message
880172823901 12/22/2004 01:37:37 PM "BRAVO you are the attentive student of this class" OLE: Send_Message
880189502590 12/22/2004 01:37:48 PM "You are already attending the class" OLE: Send_Message
880176593790 12/22/2004 01:38:32 PM "You are absent for today" OLE: Send_Message
880172798525 12/22/2004 01:38:49 PM "You are absent for today" OLE: Send_Message
880172844972 12/22/2004 01:39:58 PM "You Did not attempted Ques No 2" OLE: Send_Message
880189502590 12/22/2004 01:40:04 PM "You Did not attempted Ques No 2" OLE: Send_Message
880172977503 12/22/2004 01:40:11 PM "You are late" OLE: Send_Message
880172230474 12/22/2004 01:40:17 PM "You are late" OLE: Send_Message
880171288829 12/22/2004 01:40:33 PM " You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880172849812 12/22/2004 01:40:40 PM " You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880189405131 12/22/2004 01:40:46 PM " You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880189419681 12/22/2004 01:40:53 PM " You are absent for the 12-22-2004 Class of PROG1" OLE: Send_Message
880172798525 12/22/2004 01:42:01 PM "You are absent for today" OLE: Send_Message
880176593790 12/22/2004 01:42:56 PM "You are absent for today" OLE: Send_Message
880189502590 12/22/2004 01:43:02 PM "You Did not attempted Ques No

3" OLE: Send_Message		
880176484892	12/22/2004 01:43:23 PM	"You have been successfully registered for PROG1" OLE: Send_Message
880176484892	12/22/2004 01:47:11 PM	"You are too late for attending the class" OLE: Send_Message
880188042524	12/22/2004 01:47:44 PM	"You are Not Valid Participant" OLE: Send_Message
880172720366	12/22/2004 01:48:36 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172844972	12/22/2004 01:48:45 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880171876909	12/22/2004 01:48:54 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880176552088	12/22/2004 01:49:02 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880176412311	12/22/2004 01:49:08 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172230474	12/22/2004 01:49:15 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172832211	12/22/2004 01:49:21 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172977503	12/22/2004 01:49:28 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880176835595	12/22/2004 01:49:35 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172105137	12/22/2004 01:49:41 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880189502590	12/22/2004 01:49:48 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172823901	12/22/2004 01:49:54 PM	"You Did not attempted Ques No 4" OLE: Send_Message
880172720366	12/22/2004 01:50:00 PM	"You are late" OLE:

Send_Message	
880172823901	12/22/2004 01:50:06 PM "You are late" OLE: Send_Message
880176593790	12/22/2004 01:50:12 PM "You are late" OLE: Send_Message
880172832211	12/22/2004 01:50:18 PM "You are late" OLE: Send_Message
880172230474	12/22/2004 01:50:25 PM "You are late" OLE: Send_Message
880176835595	12/22/2004 01:50:31 PM "You are late" OLE: Send_Message
880171876909	12/22/2004 01:50:37 PM "You are late" OLE: Send_Message
880172844972	12/22/2004 01:50:43 PM "You are late" OLE: Send_Message
880176484892	12/22/2004 01:50:49 PM "You are too late for attending the class" OLE: Send_Message
880172798525	12/22/2004 01:52:18 PM "You are absent for today" OLE: Send_Message
880176484892	12/22/2004 01:52:46 PM "You are absent for today" OLE: Send_Message
880176593790	12/22/2004 01:53:02 PM "You are absent for today" OLE: Send_Message
880172230474	12/22/2004 01:53:36 PM "You Did not attempted Ques No 5" OLE: Send_Message
880189502590	12/22/2004 01:53:42 PM "You Did not attempted Ques No 5" OLE: Send_Message
880176593790	12/22/2004 01:55:59 PM "You are too late for attending the class" OLE: Send_Message
880173013365	12/22/2004 01:56:59 PM "You are late" OLE: Send_Message
880189405131	12/22/2004 01:57:43 PM "You are too late for attending the

class" OLE: Send_Message
880189502590 12/22/2004 01:57:49 PM "You are too late for attending the class" OLE: Send_Message
880172720366 12/22/2004 01:58:20 PM "You Did not attempted Ques No 8" OLE: Send_Message
880172844972 12/22/2004 01:58:26 PM "You Did not attempted Ques No 8" OLE: Send_Message
880171876909 12/22/2004 01:58:32 PM "You Did not attempted Ques No 8" OLE: Send_Message
880176552088 12/22/2004 01:58:38 PM "You Did not attempted Ques No 8" OLE: Send_Message
880176412311 12/22/2004 01:58:44 PM "You Did not attempted Ques No 8" OLE: Send_Message
880172230474 12/22/2004 01:58:51 PM "You Did not attempted Ques No 8" OLE: Send_Message
880173013365 12/22/2004 01:58:57 PM "You Did not attempted Ques No 8" OLE: Send_Message
880172832211 12/22/2004 01:59:04 PM "You Did not attempted Ques No 8" OLE: Send_Message
880172977503 12/22/2004 01:59:11 PM "You Did not attempted Ques No 8" OLE: Send_Message
880176835595 12/22/2004 01:59:17 PM "You Did not attempted Ques No 8" OLE: Send_Message
880172105137 12/22/2004 01:59:23 PM "You Did not attempted Ques No 8" OLE: Send_Message
880189502590 12/22/2004 01:59:29 PM "You Did not attempted Ques No 8" OLE: Send_Message
880172823901 12/22/2004 01:59:35 PM "You Did not attempted Ques No 8" OLE: Send_Message
880176412311 12/22/2004 02:02:04 PM "You are late" OLE: Send_Message
880176593790 12/22/2004 02:02:31 PM "You are absent for today" OLE:

Send_Message	
880176593790	12/22/2004 02:03:54 PM "You are absent for today" OLE: Send_Message
880172230474	12/22/2004 02:04:10 PM "You Did not attempted Ques No 10" OLE: Send_Message
880189502590	12/22/2004 02:04:16 PM "You Did not attempted Ques No 10" OLE: Send_Message
880172823901	12/22/2004 02:04:22 PM "You Did not attempted Ques No 10" OLE: Send_Message
880189502590	12/22/2004 02:07:43 PM "You are late" OLE: Send_Message
880172720366	12/22/2004 02:10:33 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 6;Not attmpted: 2,Pass" OLE: Send_Message
880172696308	12/22/2004 02:10:40 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 6;Attmpted: 7;Not attmpted: 0,Pass" OLE: Send_Message
880172844972	12/22/2004 02:10:47 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 3;Attmpted: 4;Not attmpted: 3,Pass" OLE: Send_Message
880171876909	12/22/2004 02:10:54 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880176552088	12/22/2004 02:11:02 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880176412311	12/22/2004 02:11:10 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 3;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880172230474	12/22/2004 02:11:17 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 1;Attmpted: 2;Not attmpted: 5,Pass" OLE: Send_Message

880173013365	12/22/2004 02:11:25 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 6;Not attmpted: 2,Pass" OLE: Send_Message
880172832211	12/22/2004 02:11:33 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 5;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880172977503	12/22/2004 02:11:40 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880176835595	12/22/2004 02:11:47 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880172105137	12/22/2004 02:11:55 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 4;Attmpted: 5;Not attmpted: 2,Pass" OLE: Send_Message
880189502590	12/22/2004 02:12:02 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 0;Attmpted: 0;Not attmpted: 7,Pass" OLE: Send_Message
880172823901	12/22/2004 02:12:10 PM "Result of class of 12/22/2004:H.W: 0;attendance: 10,Qs mark: 0;Ans Mark: 3;Attmpted: 3;Not attmpted: 3,Pass" OLE: Send_Message