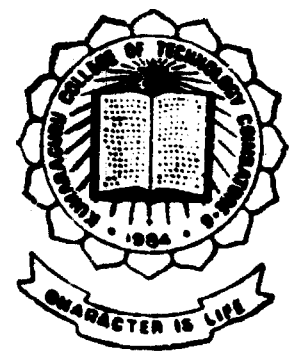
Electronic Institution

(E - Institute)



PROJECT REPORT 1999 - 2000

Submitted By
Hari Krishnan .B

Under the Guidance of
Dr. S. ThangaSwamy B.E. (Hons), Ph.D.,

In Partial fulfilment of the requirement for the award of the Degree of **MASTER OF SCIENCES** in **APPLIED SCIENCES - COMPUTER TECHNOLOGY** of the Bharathiar University.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Kumaraguru College of Technology

COIMBATORE - 641 006.

Kumaraguru College of Technology
Coimbatore-641 006

Department of Computer Science & Engineering

Certificate

This is to certify that the project report entitled **Electronic Institution (E_Institute)** has been submitted by

Mr. HARI KRISHNAN.B

In partial fulfillment of the requirements for the award of the degree of Master of Sciences-Applied Science (Computer Technology) of the Bharathiar University, Coimbatore-46 during the year 1998-00

S. J... 25/4
(Guide)

S. J... 25/4
(Head of Department)

Certified that the candidate was examined by us in the project viva-voce examination held on 28-4-00 & the University Register number is 9837Q0022

(Internal Examiner)

28/4
(External Examiner)

NUVA
SYSTEMS

15/04/2000

CERTIFICATE

This is to certify that HARI KRISHNAN.B of final year Msc(Engg)-AS(CT) of Kumaraguru College of Technology, Coimbatore - 641 006, has completed the project Electronic Institution(E_Institute) for Nuva Systems (p) Ltd, 338 Avanashi Road, Coimbatore - 641 004, during the period January 2000 to April 2000. During the course of the project his behaviour and involvement was good. We wish him success in all future endeavours.

For Nuva Systems (p) Ltd

D.R

D.Ravichandran
Manager - Developments

nuva systems training centre
A *PREMIER* IT COMPANY
"THE UFFIZI", 338, Avanashi Road • Coimbatore - 641 004 • India
Tel : (91) (422) 577544 • Fax : (91) (422) 574744 • Email : mail@nuva.com • www.nuva.com

Dedicated To My Beloved
Grand Parents & Parents

Electronic Institution
(E_Institute)

Acknowledgement

ACKNOWLEDGEMENT

An endeavor over a long period can be successful only with advice and support of many well wishers. I take this opportunity to express my gratitude and appreciation for all of them.

I wish to express my sincere and heartfelt gratitude to my esteemed principal **Dr.K.K.Padmanabhan, B.Sc. (Engg).,M.Tech.,Ph.D.**, for giving me the needed encouragement in starting this project and carrying this out to the height of success.

My hearty thanks and a deep sense of gratitude to professor **Dr.S.Thangaswamy, B.E.(Hons), Ph.D.,** the Head of the Department of Computer Science and Engineering for his benevolent attitude and spurring encouragement as a guide to push this project to its height of success. I am deeply indebted to the professor without whose motivation and guidance, I would not have been able to embark a project so successfully.

My heartfelt thanks to **Mr.Sundararaj** Dy.Manager-

EDP of Premier Mills for granting me the permission to do the project for his concern. I would also like to extend my thanks to **Mr.G.Venkatesh, B.E.,** programmer of **nuva Systems** for lending me his valuable support and guidance in getting this project a grand success.

I would also thank the entire Staffs and Students of the **nuva** concern who have really helped me in overcoming the various difficulties I encountered during the development of the project.

I reciprocate the kindness shown to me by the Staff members of the **Department Of Computer Science, KCT** who have sincerely dedicated their time and knowledge to help me get this project a grand success.

I also take this as a priviledge to thank my grandparents, parents, relatives, friends and to all those who have taken pain and effort, without whose blessings and backups during desperate times, I would not have completed the project so successfully.

Synopsis

SYNOPSIS

E_INSTITUTE is a software that has been developed based on the requirements imposed by **nuva systems** (p) LTD, Coimbatore. This software is computerized in such a way that it handles all the essential activities involved in institutional centers and enables a better management control. This software is developed in such a way that it supports multi user environment.

This project deals with the computerization of all the various operations involved in manual educational centers. The project work comprises the task of the design and development of the software package to achieve the above.

This software has been implemented using HTML and, JAVA SCRIPT for designing front end screens that include input data validation, JAVA SERVLETS that act as the middleware between the application and the database and MS-ACCESS 7.0 as the back end.

The complete system has been developed to provide the user a very good graphical user interface. It contains data validation procedures to avoid the user entering irrelevant data.

Thus the overall aim of the project is to computerize traditional institutional activities. This project provides a more reliable, flexible, accurate and fast solutions for the various activities involved in the manual process.

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Introduction

INTRODUCTION

1. Project Overview:

The project entitled **Electronic Institution (E-Institute)** provides all the routine as well as exceptional features, which are present in the manual day to day, class room tutorials. It also rectifies various difficulties encountered in the current process with the help of an automated computerized process. This software has been developed under the requirements imposed by the **NUVA SYSTEMS,** CBE.

The software aims to serve several users simultaneously. The software is created in such a way that it is adaptable for the web environment. In the **class room session**, there can be many learners who are interested in different subject areas. They can concurrently access their respective subjects by using the provisions of **E-Institute** software. Since different clients will be accessing the software from different platforms, the

project needs to be developed using a platform independent software like **JAVA ENVIRONMENT.**

The complete system has been developed in a user friendly manner thus providing the various users ease and interest to work with it. The software provides not only class room tutorial features but also **tests the knowledge** of the learner gained by the tutorial session in an exclusive manner. It also includes **doubt clearance** during the tutorial sessions and **online library** reference for further knowledge. One of the remarkable feature of the project is its capability of keeping its subject data consistent throughout the teaching programme by collecting the latest information with the help of **feedback reports.**

In addition to the above mentioned features, the software pays attention to performing the validation check enhancing the **security** for the users. This tracks the complete process of the E-Institute software users from the point of entry to the class sessions until the user exits from the software.

2. Organisation Profile:

nuva Systems is part of a USD 150 million organisation with headquarters at Coimbatore, India. Organisational IT systems over the past few decades have collected vast stores of data. Today's requirement is to derive "Intelligent Information" from such data and to also allow this data and information to be accessed from and across distributed geographical points using expeditious and inexpensive communication channels such as the Internet. Nuva's primary business focus is to add such "Intelligence" and "Mobility" to data.

nuva is dedicated to developing and providing cutting edge technology solutions in the areas of :

- Business Intelligence
- Data Warehousing
- CRM
- SCM
- eCommerce
- Groupware and Knowledge Management

Z Migration and Web Enabling

Nuva's solutions are always innovative and state-of-the-art and at the same time practical and user-friendly, with a laser sharp focus on achieving our clients' business goals.

Our secret is our People. A rich pool of business and technical consultants ensures a superior understanding of information systems across various business processes as well as technically superior solutions, utilizing the best of today's technologies.

All projects are monitored by Nuva's Quality council to ensure consistent high quality work.

2.1 Services:

Complete and timely information is critical for effective decision making. Business Intelligence is the process of getting the right information in an expeditious and usable manner, the analysis of which can have a positive impact on the organisation's business strategy or operations. Business Intelligence can also

recognize business patterns and make them noticeable.

Business Intelligence enables introspection - this means tracking actual business performance with respect to business strategy and identifying areas for corrective and preventive measures, like deadlines missed, recurring fluctuations in sales, sales promotion impacts, margin analysis, etc.

Business Intelligence applications include Budgeting & Forecasting, Customer Profiling, Logistics Management, Accounting, Margin Analysis, Performance Monitoring, Resource Management, Strategic Planning, Supply chain, etc.

Business Intelligence is the application of data, information and knowledge originating from both inside and outside the organisation and is achieved by data gathering and analysis. Data gathering is achieved using Data Warehousing methodologies and data analysis is performed by specialized OLAP tools like Nuva's iWITNESS.

2.2 Hardware and Softwares Being Used:

Platforms :

HP-UX, SCO-Unix, AT&T Unix, LINUX, Windows NT/9x, Novell Netware

Databases:

Oracle, Sybase, Informix, Ingress, MS-SQL, MS Access, Visual Foxpro, Xbase, Jasmine, ODBC across platforms/systems

Data Warehousing:

ETL (Extraction, Transformation and Loading) skills, Datawarehousing/Datamart creation and Management, Frontend Queries, Analysis and OLAP Tools

Front-ends:

VB, PB, Delphi, Developer 2000, Visual Foxpro

Programming Languages:

VC++,Java, Visual J++

Internet & Intranet:

Lotus Domino, HTML, DHTML, XML, Java, Perl, CGI-Script, Java Script, VB-Script, ASP HTML Servers-IIS, Domino, Apache, MS Transaction Server, MS Site Server ADO, JDBC

Group Ware :

Lotus Notes, MS-Exchange

Networking Solutions:

TCP/IP, NetBEUI

3GLs:

C, COBOL

Software Environment

SOFTWARE ENVIRONMENT

1. INTRODUCTION TO SERVLETS

Servlets provide a JavaTM-based solution used to address the problems currently associated with doing server-side programming, including inextensible scripting solutions, platform-specific APIs, and incomplete interfaces. Servlets are objects that conform to a specific interface that can be plugged into a Java-based server. Servlets are to the server-side what applets are to the client-side -- object bytecodes that can be dynamically loaded off the net. They differ from applets in that they are faceless objects (without graphics or a GUI component). They serve as platform-independent, dynamically-loadable, pluggable helper btecode objects on the server side that can be used to dynamically extend server-side functionality. For example, an HTTP servlet can be used to generate dynamic HTML content. When you use servlets to do dynamic content you get the **following advantages:**

① they're faster and cleaner than CGI scripts

② they use a standard API (the Servlet API)

③ they provide all the advantages of Java (run on a variety of servers without needing to be rewritten)

The Attractiveness of Servlets:

There are many features of servlets that make them easy and attractive to use.

Servlets are:

- Easily configured using the GUI-based Administration Tool.
- Loaded and invoked from a local disk or remotely across the network.
- Linked together, or chained, so that one servlet can call another servlet, or several servlets in sequence.
- Called dynamically from within HTML pages, using server-side include tags.

secure - even when downloading across the network, the servlet security model and servlet sandbox protect your system from unfriendly behavior.

(NOTE: Security in the JavaTM Web ServerTM is provided by combining the

code-signing facility of JDKTM 1.1 and the Access Control List implementation of the Server Toolkit. This allows servlet classes, or servlet JAR files, to be signed. The signers are then assigned permissions in an access control list. For more information on servlet security, see Security Administration for Java Web Server).

There are **other advantages to the Servlet API** as well. These include:

1. It's extensible - you can inherit all your functionality from the base
2. Classes are made available to you.
3. It's simple, small, and easy to use.

2. INTRODUCTION TO JAVASCRIPT:

JAVASCRIPT is an object oriented based scripting language designed primarily for authors constructing HTML documents for viewing under Netscape Navigator, Internet Explorer3.0 and above. JavaScript maintains platform

independence since its scripts are interpreted at the browser level.

JavaScript runs on both client side and server side. Using JavaScript, you can:

1. Create a user form that lets the user click on a displayed map.
2. Design a web page that automatically displays a different thought provoking quotation.

Similarities to Java:

JavaScript shares the following similarities with Java. They are:

Z Both Java and JavaScript use the same expressions for statements that execute arithmetic and logical operations, as well as those that perform string operations.

Z JavaScript uses all of the control flow statements that are available within Java: If...else, loops, while loops, and for loops.

Z JavaScript and Java were both developed to be languages for Internet. Security features are shared by both these languages.

Differences with Java:

- Unlike JavaScript, Java uses strict data types.
- Java source code is first compiled and the code interpreted by the client. JavaScript code is not compiled but it is only interpreted.

3.WHAT IS HTML:

The Hypertext Markup Language is the language of the World Wide Web. HTML is part of nuts and bolts of the web. Every document on the web is written in HTML, and all the document formatting, clickable hyperlinks, graphical images, multimedia documents, fill in forms are all based on HTML.

4. INTRODUCTION TO ACCESS 97:

MS - ACCESS is a powerful RDBMS. It supports multi user environment. It is a user friendly software. It provides visualized tools to define the relationship between the tables. An ACCESS database consists of the tables that hold

the data and all the related objects such as Queries, forms and reports that are used to manage the data.

When you open the database, Access displays a database window, called a database container because it contains all the objects that contain the database.

Salient Features Of MS ACCESS 97:

1. Using Access utilities to manage the database an their objects.
2. Using hyperlink data type.
3. Creating web pages.
4. Attaching a table from other databases application so that Access and other applications can use it simultaneously.

Software Requirements

constraints. It is this document that acts as a major reference during further

Generation of Register number and Password for new users

Class Room session:

Interactive Information unit which services various students in different areas with doubt clarification (class session).

Knowledge testing phase:

Provisions for online test

Generation of performance reports.

Library module:

Reference to Online Library.

Feedback module:

Sources are provided to provide feedback after the class room session. Provision for updating the database based on the feedback is possible if system administrator feels the information is relevant.

1.3 Definitions and abbreviations

Definitions

Electronic Institution:

This term refers to an electronic education center where it incorporates teaching, testing, reference and so on.

Invalid user:

This term denotes that the user access is denied because of entry of wrong register number and password.

Replication tried out:

This denotes that the access is denied in the registration section since the user is trying to duplicate the information of already registered user.

Abbreviations:

EI or ei- Electronic Institution

C11 or d11- Name given to C Language or DBMS Language's first module.

C21 or d21- Name given to C Language or DBMS Language's second module.

C31 or d31- Name given to C Language or DBMS Language's third module.

2. General Description:

2.1 Product Perspective:

The perspective of the product is as follows:

- φ Can be used by any person including novice users.
- φ Very user friendly.
- φ Adaptable to all platforms.
- φ Provides knowledge, extra reference and also tests the level of knowledge obtained.
- φ Flexible enough to accept and update itself through proper feedback

2.2 Product Functions:

- *Authorization checking and permission granting.*

This first module of the project *checks for the entry of users*. The *user_id* for the enrollment with the software and the *test register number* for the enrolled users will be *automatically generated* by the software.

- *Information unit (class room session) which services various students in different area*

The information unit which *plays the role of the tutor* should be capable of serving many users *concurrently* who would have requested services in different areas.

- *Testing the knowledge gained (Online Test and Performance Report generation)*

This module enables user appear for tests in subject of

their choice. The test is conducted in such a way that the *questions are thrown with increasing level of complexity*. The *performance report* will be prepared for each user by giving him the summary about the performance in his test.

- *Library reference for the desired subject*

This module gives the *option*_for the user *to get more details* for the particular subject.

- *Feedback module*

This stage supports the user to give suggestions regarding the entire working of the software and how much the software was beneficial to him. Provisions are also given for *submitting technical information.*

2.3 User Characteristics:

This site is for users who are familiar with browsing through the Internet. Person not familiar with browsing would find some

difficulty for navigating through the software. Any novice users who need to gain knowledge in particular subject with the help of this product can use the software.

2.4 General constraints:

1. Unregistered users are not allowed to utilize the software.

2. Subject Selection is a must for utilizing the various features of the software.

3. The test should be completed within the specified time duration.

4. The user should have an excellent knowledge related to the subject before attending the test. Otherwise he will be restricted to the preliminary questions of the software by not giving exposure to the advanced sections of the software.

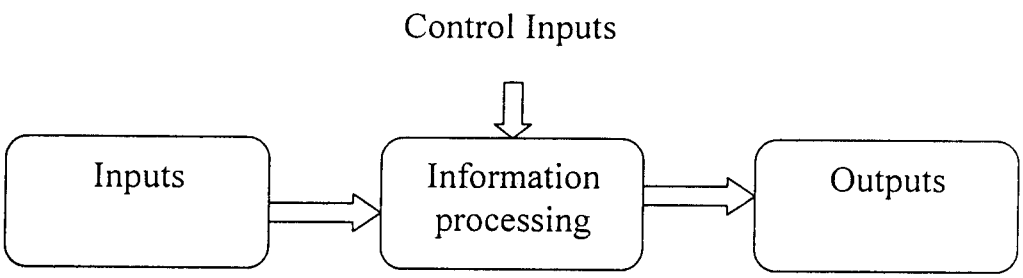
3. SPECIFIC REQUIREMENTS:

3.1 Functional requirements:

P-432

Introduction:

Functional requirements specify the relationships among the inputs, actions and the outputs. Here inputs are got from the end user, processed and the corresponding output actions are delivered to the end user.



List of inputs:

Some sample inputs got in this software are:

- Getting full details regarding the user during registration.
- Receiving register number and password from the user for letting him inside the software.

- Asking his suggestion about his field of interest.
- Getting the inputs in a serial fashion during the test session.
- Requesting feedback from the user.

Information Processing Required:

- Validation for allowing the registration of the new user and verification of the existing user is required.
- Getting the field of interest from the user, so that the remaining part of the software should act according to the user's request.
- Enormous computation is required during the test phase like disabling the question thrown once the time limit elapses.
- Repeated displaying of the same question is avoided for the same user.
- Random throwing of question should be ensured based on the complexity rating.

List of Outputs:

- Once the subject is selected, its corresponding tutorial is presented.
- When the user clicks on the doubt button the various possible frequent questions are displayed through which he could clarify all his doubts.
- Online instant results after the completion of test is provided.
- Permanent performance sheet is also provided based on the request.

3.2 Performance requirements:

Security:

In this product security is given foremost importance because this is the first process which is done before any other access to the software is given. Registered users are not allowed to register again nor novice user with the same details of the registered user is given permission.

Availability:

The software is made available to any user irrespective of location, time and other factors.

Capacity:

The product is designed with web based technology so that it can be accessed from different platforms and can accommodate any number of users.

Response time:

The response time for various activities of the software depends upon the configuration of the client machine as well as the network performance.

3.3 Design Constraints:

3.3.1 GuideLines:

GuideLines are specifications that initiate the proper construction of the product. There are many guidelines for requirements documents, design specifications, structured coding conventions, documents for testing, installation manual, user manual etc., contribute to the understandability and hence maintainability of the software. Some of the

guidelines complied are:

3.3.1.1 Coding GuideLines:

- Goto statements are not used.
- The nesting depth of the program constructs do not exceed five levels.
- Subroutine lengths do not exceed thirty lines.
- Descriptive names from the problem domains for user defined data types, variables, formal parameters etc., are being used for providing the proper comments.
- Long obscure comments are avoided.

3.3.2 Hardware Limitations:

The software developed is expected to work with only the hardware with the following minimum specifications:

Processor: Intel 486-based PC

Primary memory: 32 MB RAM

Secondary memory: 1.2 GB

3.3.3 External Interface Requirements:

3.3.3.1 User Interfaces

The user is provided with friendly and clear interfaces. There are different interface styles for registered users, new users, class room, examination sheet, performance sheet, library reference, feedback report etc.,

3.3.3.2 Hardware Interfaces

Certain hardware interfaces are to be used inorder to make the software available in the web environment. The application server processes the request from the user and directs the response to the requestee with the help of modem and telephone line.

All the above specified requirements are agreed by both the developers and the customers and will be brought into notification whenever the modifications or enhancement is needed. The developers are required to take the client on a comprehensive tour of the online system and ensure that all agreed specifications are met.

System Study & Analysis

SYSTEM STUDY AND ANALYSIS

1. Study Of Existing System:

nuva being a company of a high quality and a company of great market value, have decided to produce a software, which have an aim of completely automating the manual educational process. They have a **nuva** training division in which the education process takes the normal path, which is found in almost other institutions. The most common activities involved in the manual educational process are conducting the learning sessions as the first and foremost activity till the knowledge gainer is satisfied. Then inorder to test the depth of understanding and to gain confidence, a formal examination process is conducted. Once the examination is over the display of performance is made inorder to make the learner be aware about his faults.

So once the learning process and knowledge testing part is over and if the user requires further clarification on any selected matter

then the library reference will be utilized. There will be also some formalities like getting feedback where by the tutor identifies whether his explanation is apt or not. These are some of the regular day to day procedures going on in all the education institutions and as well as in **nuva**.

Some of the drawbacks of the manual system are:

- There can exist a chance for certain learners that produce fearful communication between tutor and learner because of some psychological effects. This induces the improper sharing of knowledge, which cannot be rectified very quickly and effectively. This problem will be normally found out after the examination stage where by it becomes a long and inefficient process to teach them again.
- Suppose if the class session is understood well and if the learner is satisfied at that instance and requires further clarification during later revision then it becomes difficult for the student to get back to the tutor

especially if the problem for him is to repeat it several times.

- Availability of coaching ***at any time*** irrespective of location also becomes difficult. This is because the tutor can provide his service only at a particular instance from one place.
- Providing ***complete privacy by*** proper ***isolation*** from other learner's in a mass environment also becomes impractical. This would not be convenient for certain type of learners.
- Learner's skills are tested by ***examination methodology*** and further guidance are not provided immediately because of some common problems like valuation etc.,
- Even though ***different categories of test*** like general, specialized ones are provided, the inaccurate valuation many a times makes the time and effort unfruitful.
- Further reference regarding subjects are facilitated through ***library***

But sometimes it is found ineffective because of excessive time

consumption.

- ***Even if feedbacks*** are collected and relative actions are taken, it proves to be useless at times because of the direct communication between the learner and the tutor.

2. Proposed Computerized System

In order to solve the problems encountered in the manual system, the computerized system is designed to take care of the above faults and a complete automation is expected to give better solutions for it.

The requirement imposed for the project by the client necessitates the software to have various features in each module, so that the software works with desired performance.

Some of the major modules which performs some automated functions are listed as:

- **Authorization checking and permission granting.**

This first module of the project *checks for the entry of*

users. If the user is an *existing user* the software asks for his user_id and password in order to create an entry in to the software. If the user is a *new user* the software request him to answer the registration form in order to enroll him, so that he gets his entry in to the software.

* *Generation of Register number and Password for users*

The *user_id* for the enrollment with the software and the *test register number* for the enrolled users will be *automatically generated* by the software.

The provision for the generation of the *desired password* for the user is also provided.

- ***Information unit (class room session) which services various students in different areas***

The information unit which *plays the role of the tutor* should be capable of serving many users *concurrently* who would have requested services in different areas. The class room sessions are designed to

perform the following:

1. It has to provide a list of various subjects
2. Each user upon selecting different subjects at the same time, the classroom should be able to provide the *satisfaction without any overlapping* between them.
3. The classroom has to *start automatically* from the left over topic if the student has already attended the class room session. It should also have *the flexibility to discuss* the *previously completed tutorial* module if requested by the user.
4. The classroom is interactive so that it lends the user *to discuss doubts* in the middle of the tutorial session.
5. Once the user has been cleared with the doubts, the class room session should *automatically resume* such that it provides the continuity.
6. Finally if the user is willing to *exit out* of the classroom, then the system should have a feature to resume at a convenient later time.

- ***Testing the knowledge gained (Online Test and Performance Report generation)***

This module gives permission to take up test for the users, by giving *choice* for them *to select the test subject*. The test supports different types of users like beginners, specialists, people who are moderate etc., by giving provisions like

* Attending test for particular stage

* Prepared to take up full test

The test is conducted in such a way that the *questions of changing complexity level are posed to the candidate.* That is one question will be given to the user while he is ready to attend the test. If the answer given by him is right then the next question given for him gets more complex than the previous one. If the answer is wrong then the next question that will be thrown will be somewhat easier than the previous one.

In this way the test continues.

The test questions are designed in such a way that *no two users* will be given the *same questions* in the same order. This ensures that the users if by chance, sits in their successive terminals, cannot discuss their answers.

The *test duration* will be specified in the beginning itself. This process is initiated only if the answer for the given question is selected by the user in the choice selection manner like a, b, c, or d. If the test slot gets over then the test session will be cut down automatically. If the learner finishes the test before allotted time then he can press the finish button, to get his results.

The *performance report* will be prepared for each user and displayed as summary about the performance in his test.

- ***Library reference for the desired subject***

This module gives the *option* for the user *to get more*

details for the particular subject. This is done by getting the required subject from the learner. Then the related textbook reference for the particular subject is given by linking to other websites.

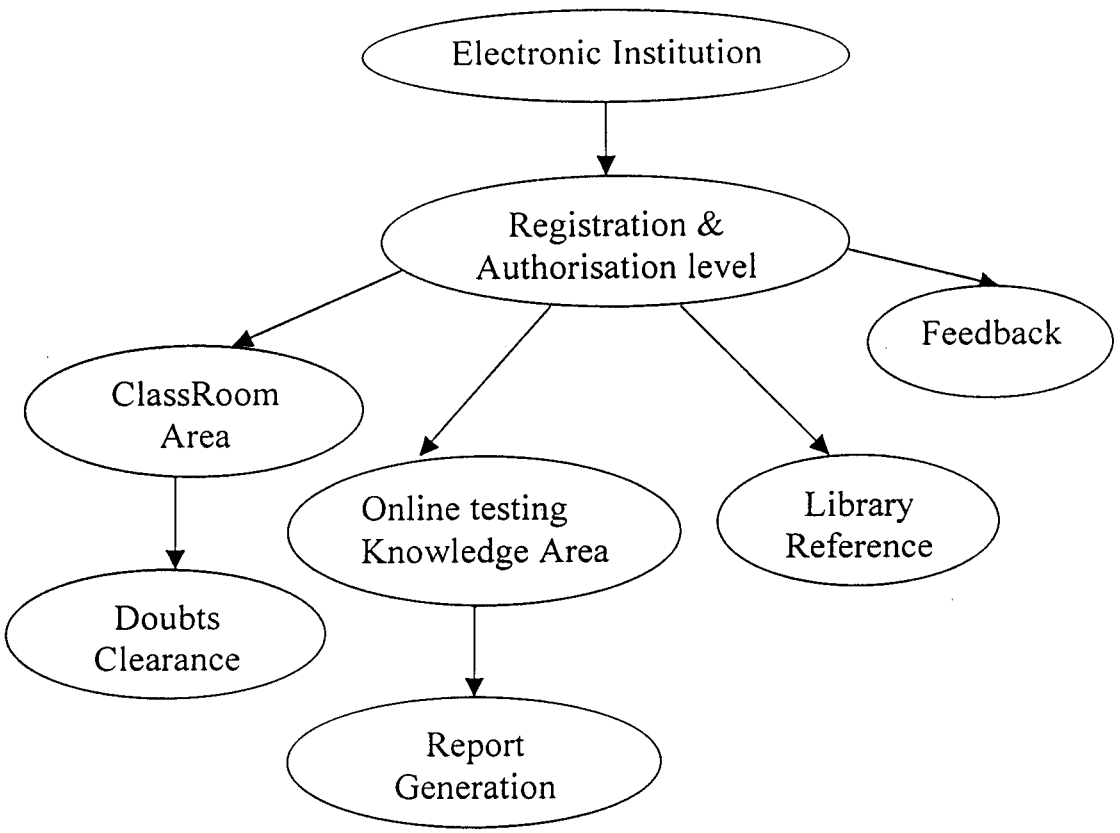
- ***Feedback module***

This stage supports the user to give suggestions regarding the entire performance of the software. This module gives provisions for the users to

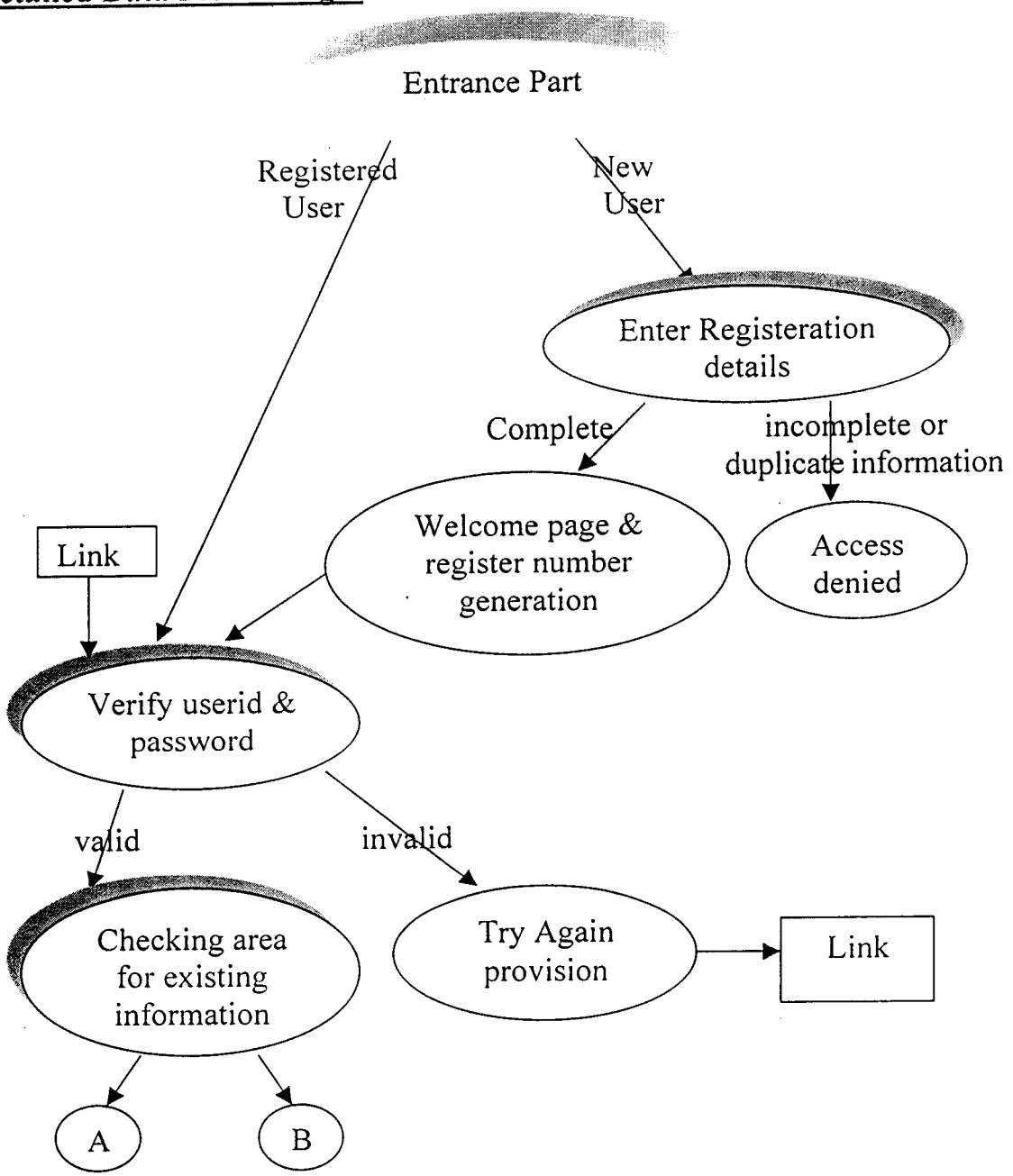
- Enter feedback as good, bad, excellent, not worth etc.,
- Once the above is done, the user can *enter the reason* for their comments *in non_technical terms.*
- Another provision will be provided for *submitting technical information* for the user. That will be analyzed by the *system administrator*, and will be included in the main database, if the information is really acceptable.

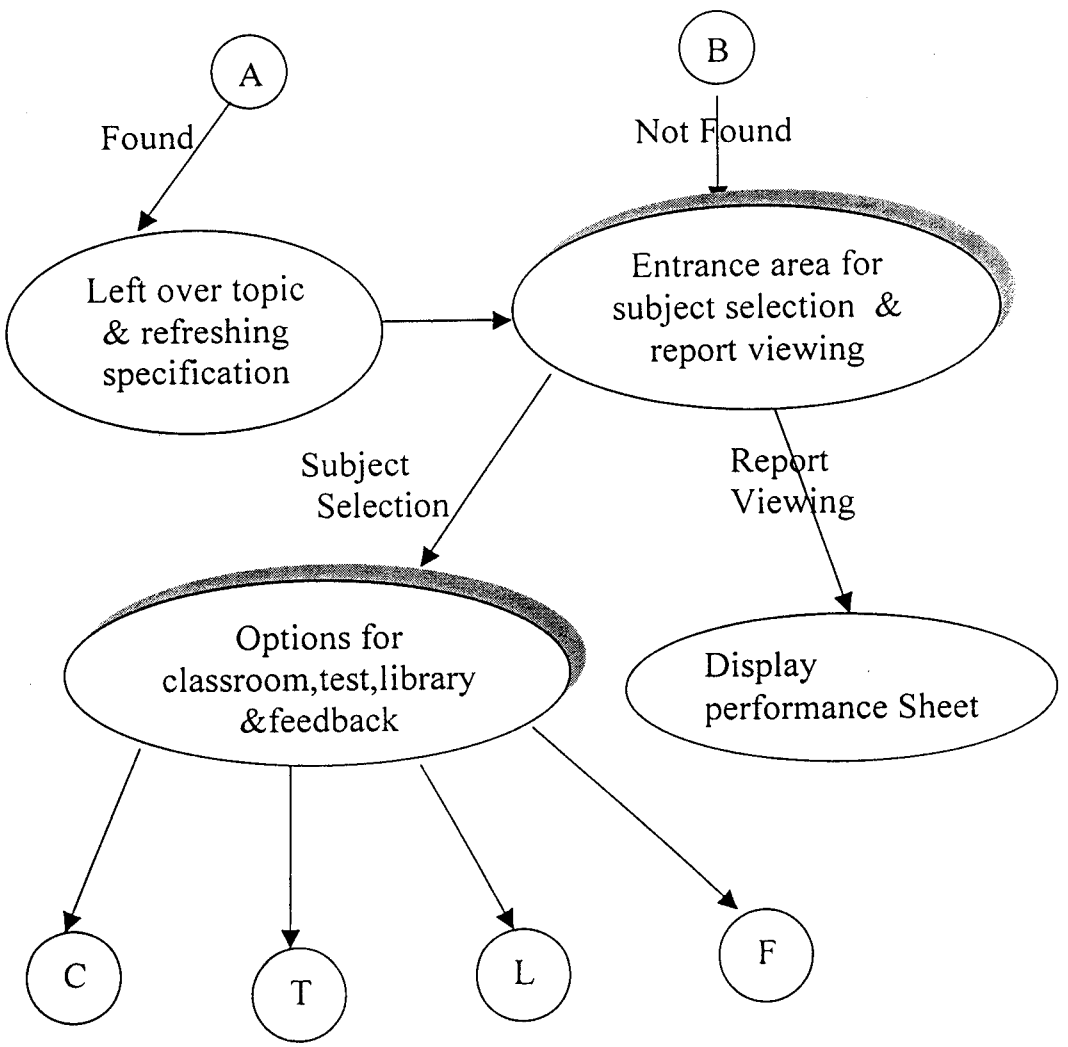
1. Data Flow Diagrams:

Preliminary Data Flow Design:



Detailed Data Flow Design:

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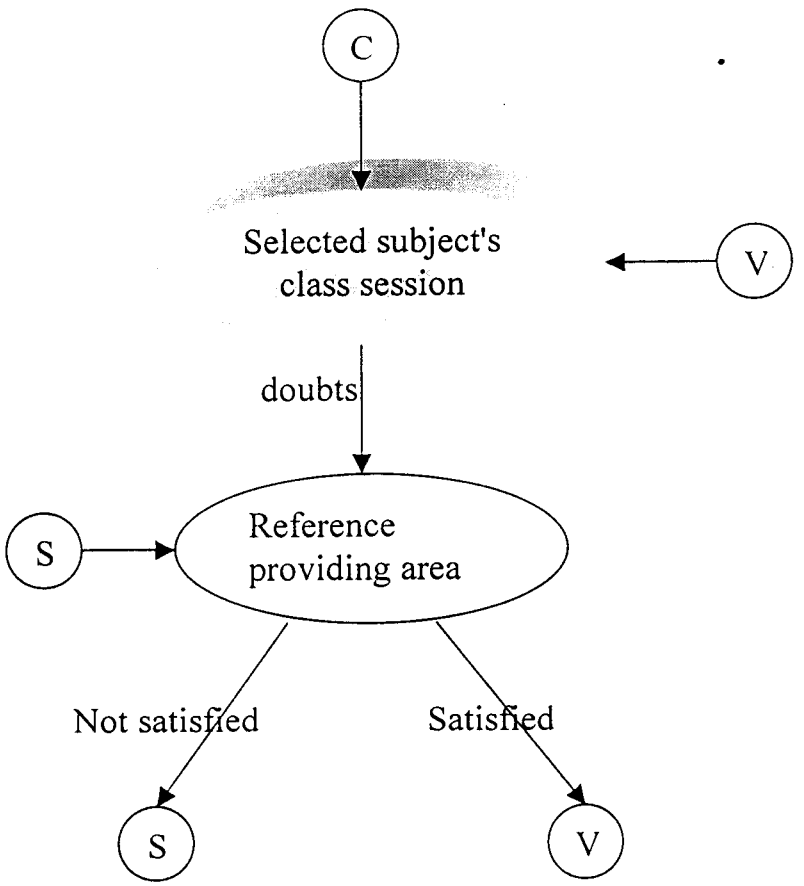

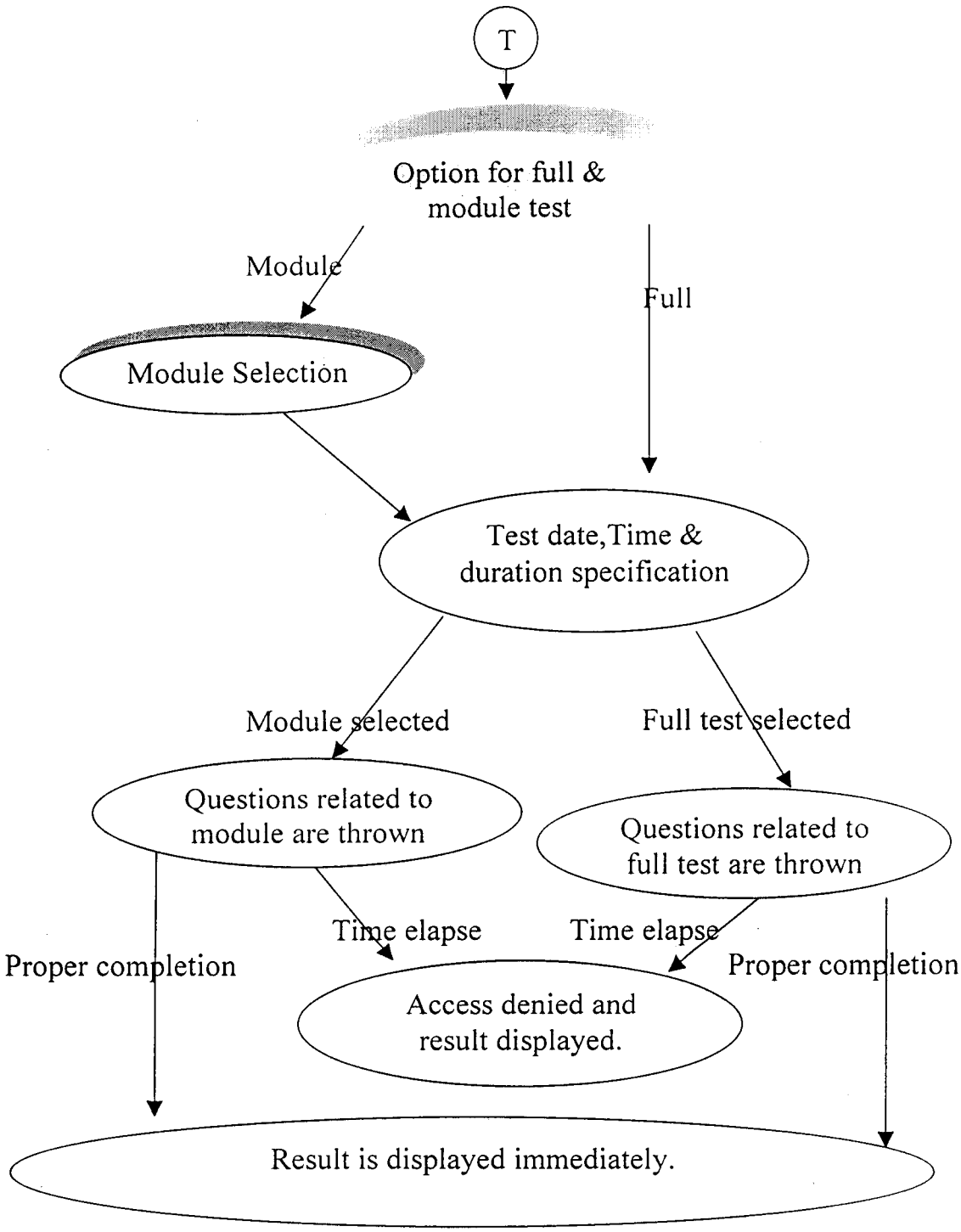
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Option for full & module test
Module
Full
Module Selection
Test date,Time & duration specification
Module selected
Full test selected
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Questions related to full test are thrown
Time elapse
Time elapse
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Proper completion
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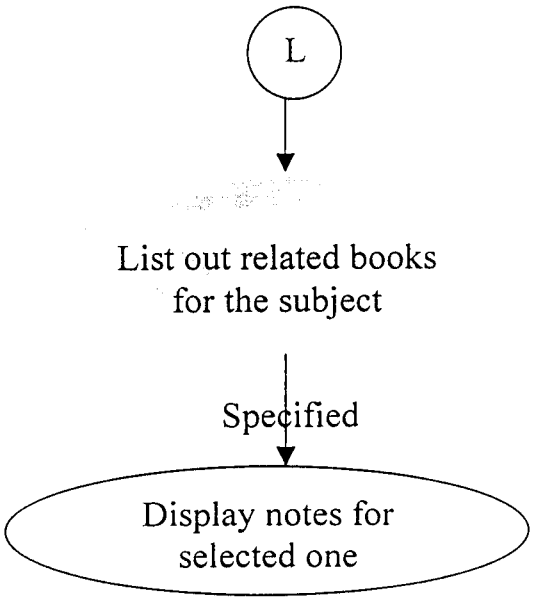
Result is displayed immediately.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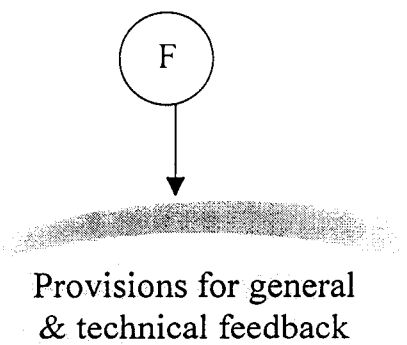
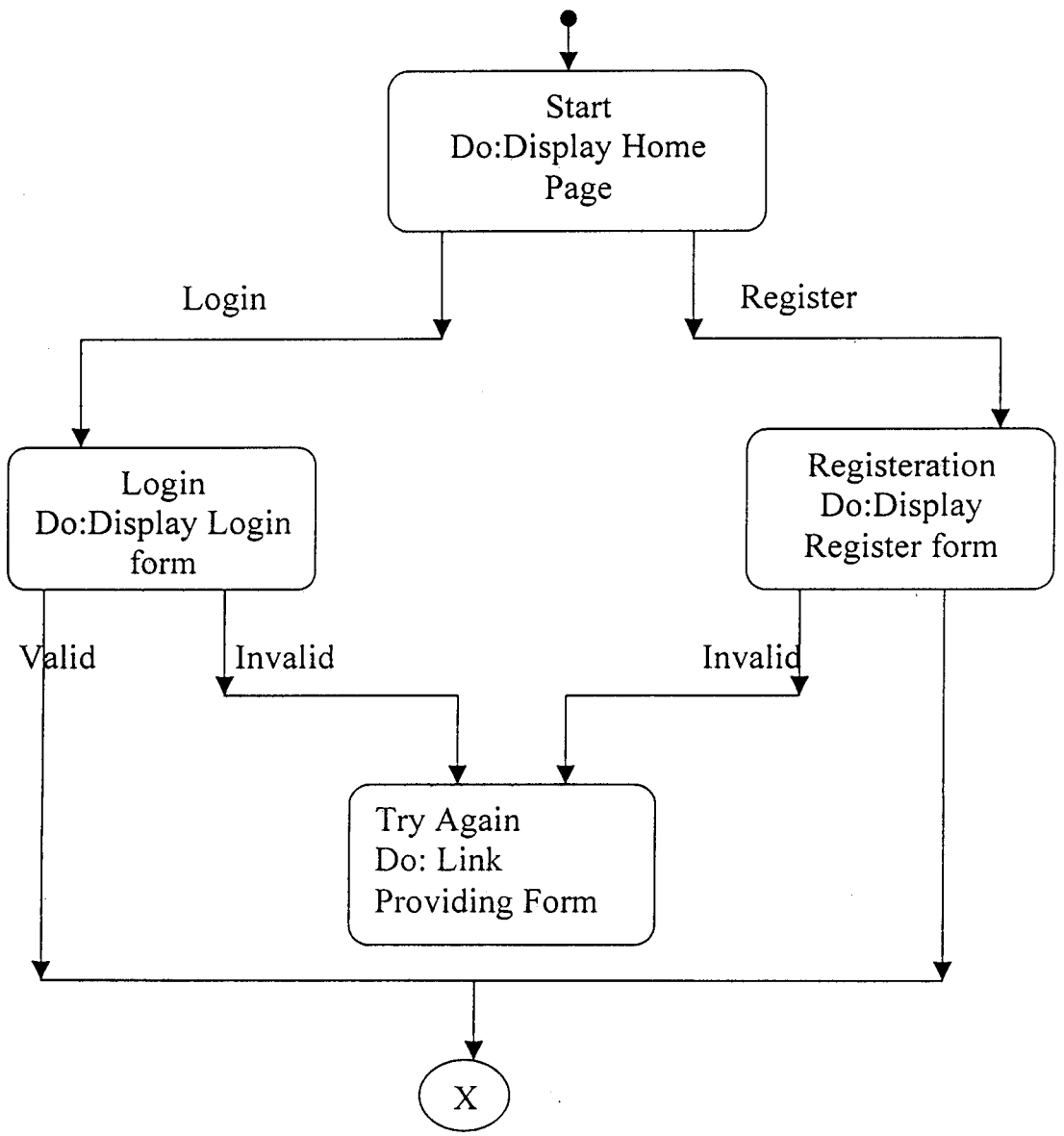
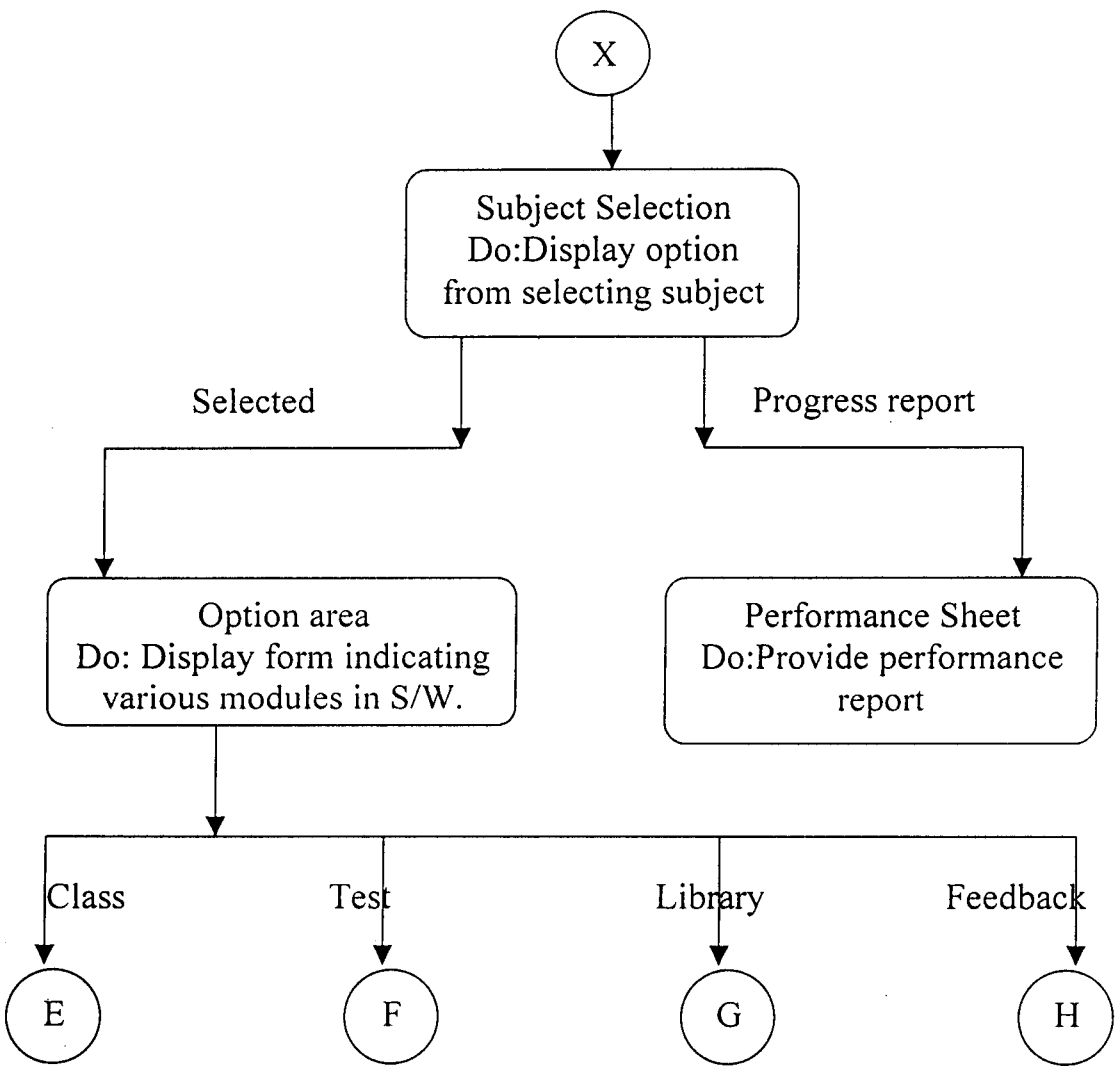
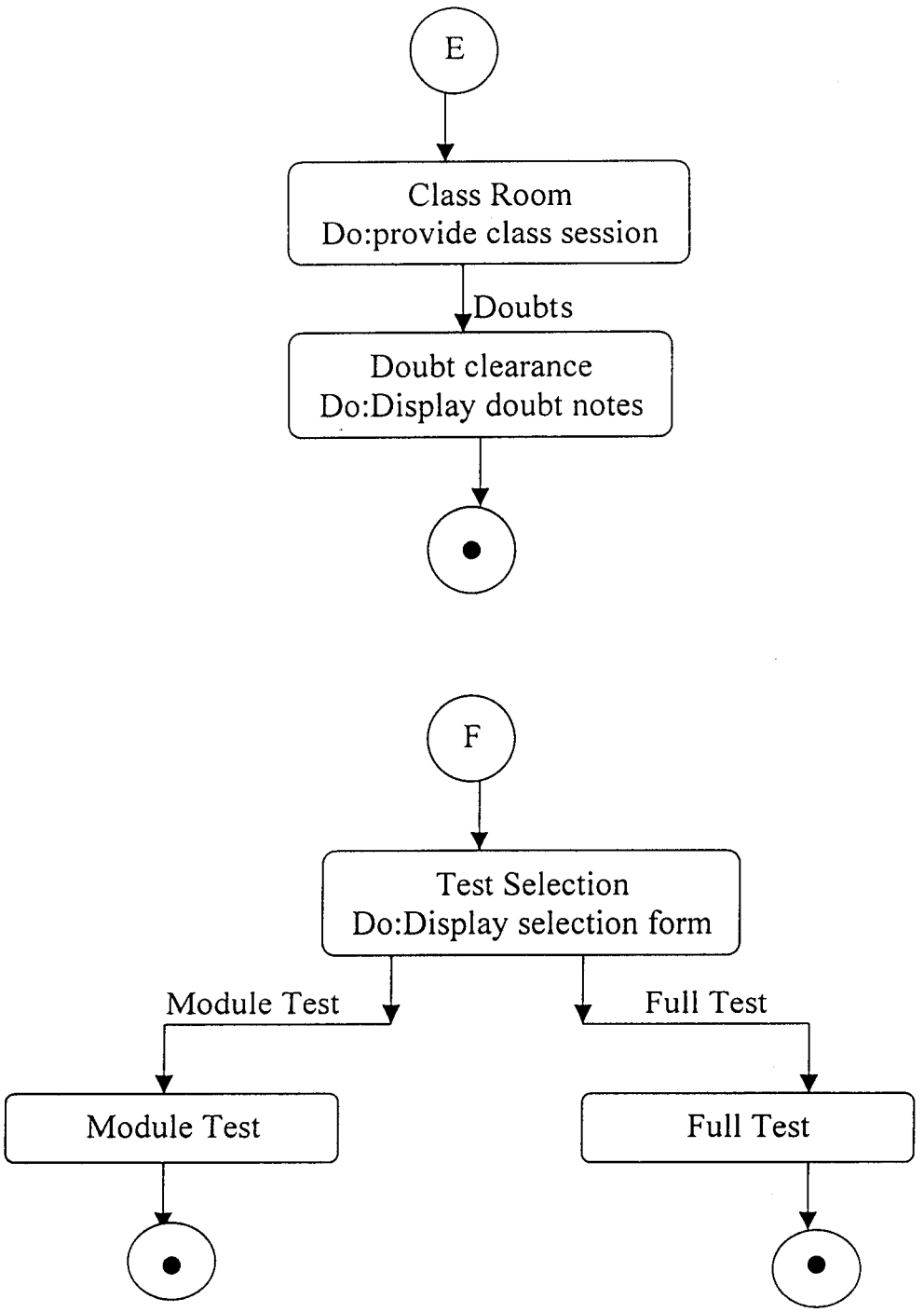
List out related books
for the subject
Specified
Display notes for
selected one

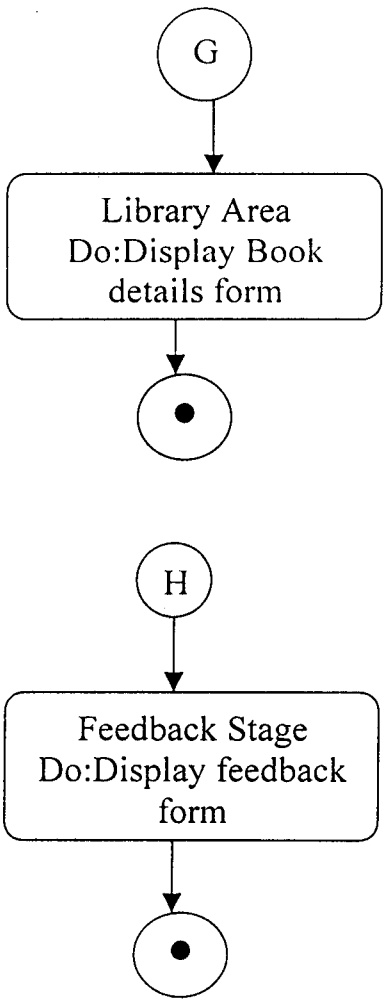

F
Provisions for general
& technical feedback

State Tansition Diagram:




X
Subject Selection
Do:Display option
from selecting subject
Selected
Progress report
Option area
Do: Display form indicating
various modules in S/W.
Performance Sheet
Do:Provide performance
report
Class
Test
Library
Feedback
E
F
G
H


E
Class Room
Do:provide class session
Doubts
Doubt clearance
Do:Display doubt notes
F
Test Selection
Do:Display selection form
Module Test
Full Test
Module Test
Full Test


G
Library Area
Do:Display Book
details form
H
Feedback Stage
Do:Display feedback
form

2. Input Design

A major part in the design of the system is the preparation of the input and it requires very careful attention. Often the collection of input data is the most expensive part of the system. The input design stage is necessary for the successful development and implementation of the system. So measures are to be taken to obtain:

- High level of accuracy of information.
- Ensure that the interface used to get the input is acceptable and clear to the end user.

Data accuracy:

Every effort is taken to ensure that the input data remains accurate from the stage he enters to the stage where he exits. This is because any slackness in evaluating the accuracy of input leads to the proper processing of the wrong input data and finally displays the deviated result from the expected behavior.

Data validation:

There are procedures designed to detect errors in data at lower or higher level. Procedures are designed to check the record, item or field against certain criteria specified in the system specifications. The following guidelines were strictly followed while designing the input screens of the system:

- Clearly identify the screen and its purpose
- Easy to use.
- Ample writing space for inserting the data.
- Ensure meaningful error messages.

While designing the project e_institute all the above specified design criteria are taken into consideration so that the input screens will be clearly understandable to the novice users. In this project the input is entered through the keyboard as well as with the help of mouse.

Validation checks are done for the input and data error message boxes are

displayed instantly.

Various input screens used in the project are:

Some of the input screens used in this project are

REGISTRATION FORM :

This form is used for getting the complete details of the user or student like name, password, address, phone and other personal details. Once the details are found alright, the automatic register number generation will be done. This indicates that the user is registered to use the software.

LOGIN FORM :

This form is used for entering in to the software. In this form the user_id and password is got as input.

SUBJECT SELECTION FORM :

This form is used to get the area of interest from the learner. The whole software will function only based on the selection of the

subject from a pull down menu available in this form.

EXAMINATION QUESTION SHEET :

This form actually displays the question and various optional answers for it. The user is given permission to choose one. Once the user completes one question, then the next question will be displayed to get the input from the user. In this way the process continues till the end of the test.

3.Database Design:

It is very important that the database is designed in such a way that it is capable of storing all the relevant information. Database management allows the data to be protected and organized separately from other resource. Database is defined as a collection of inter related data with minimum redundancy to serve the user quickly and efficiently.

DATABASE OBJECTIVE:

The organization of data in a database aims to achieve two major objectives. Data Integrity and Data Integration.

DATA INTEGRATION:

Within same system, if one logical information is referred by more than one entity then it will be implemented in such a way that the same logical field will be used in different database tables.

So the way to avoid these types of problems is to store all unique data in one place and allow each application to access it. This lead to more consistent information. This also leads to less data redundancy.

DATA INTEGRITY:

Centralized control can also ensure that adequate checks are incorporated in to the database to provide data integrity. Data integrity means that data contained in the database must be accurate and consistent. In order to achieve this properly data should be kept in the normalized form.

NORMALIZATION:

Normalization is the process of simplifying the relationship between data elements in a record. Through normalization a collection of data in a record structure is replaced by successive record structures that are simpler and more manageable. Normalization is carried out for the following reasons:

1. To structure the data so that pertinent relationship between the entities can be represented.

2. To simplify the maintenance of the database through update, insertions

and deletions.

3. To reduce the need to restructure and organize data when new application requirement arises.

STEPS INVOLVED IN NORMALIZATION:

- φ Decompose all the data groups in to two-dimensional record.
- φ Eliminate any relationship in which data elements do fully depend on the primary key of the record.
- φ Eliminate any relationship that contains transitive dependencies.

Thus through normalization, an effective database design can be achieved.

DATABASE TABLES

Feedback Table:

Field Name	Data Type	Description
u_id	Text	User Id
s_name	Text	Subject Details
Feed	Memo	General Feedback
Utech	Memo	Technical Feedback

Full Test Report:

Field Name	Data Type	Description
u_id	Text	User Id
s_id	Text	Subject Id
frt_ans	Number	Total Right Answers
Date	Number	Date
Month	Text	Month
Year	Text	Year
hos	Text	Start Hours
mins	Text	Start Minutes
secs	Text	Start Seconds
hoe	Text	End Hours
mine	Text	End Minutes
sece	Text	End Seconds

Library :

Field Name	Data Type	Description
s_id	Text	Subject Id
b_name	Memo	Book Name
w_site	Text	Web_Site

Module:

Field Name	Data Type	Description
m_id	Text	Module Id
m_des	Text	Module Description

Sub_Link:

Field Name	Data Type	Description
s_id	Text	Subject Id
m_id	Text	Module Id
ht_name	Text	Html reference

Subject:

Field Name	Data Type	Description
s_id	Text	Subject Id
s_des	Text	Subject Description

User Login:

Field Name	Data Type	Description
u_id	Text	User Id
u_name	Text	User Name
u_pass	Text	User password
u_age	Number	User age
u_sex	Text	Sex
u_addr	Memo	Address
u_phone	Text	Phone
s_id	Text	Subject Id
m_id	Text	Module Id
u_eid	Text	Email Id

4. Output Design:

Output designing is a very important phase in the designing of the system. Outputs from the computer system are primarily required to communicate the result to the end users. They are also used to provide a permanent copy of the results for future reference. The design of the software depends on the design of the output, which is one of the main requirements of the user. So designing the desired output is an important factor, which determines the worthiness of the software.

The standards that were maintained for the output design are:

- Each output is given a specific name or title.
- All the reports are to be in a clear format.

In this project, outputs are used in various modules. Samples of those are:

PRESENTATION OF SUBJECT CONTENTS :

In the classroom sessions when the student requests a tutorial for one module or chapter then the contents will be displayed in an understandable manner. It is important that the outputs are fed in an interesting manner so that the student does not get fed up with the subject.

PERFORMANCE SHEET :

This output contains all the persistent information regarding the results of the tests undergone by the student.

System Development

SYSTEM DEVELOPMENT

The software package **"Electronic Institution (e_institute)"** is developed using appropriate front ends and back ends. The front end screens are created using HTML AND JAVASCRIPTS , servlets are used as middleware and MS-ACCESS 7.0 is used as the backend. This is a user friendly package and is designed as per the expectations of the end user.

The e_institute is designed to contain five modules where by it utmost automates the operations of the manual process. The main modules in this system are:

① Authorization checking and permission granting.

② Information unit (class room session) and Performance Report generation

③ Online Test

④ Library reference

⑤ Feedback module

When the user chooses the **authorization checking** and permission granting module the following options are displayed.

New user.

Registered user.

In the new user part there is a process called **registration**. In this process various validations are performed in order to keep the registered user list consistent. Once the user is registered the automatic generation of registration number is done.

There are also validation checking employed in the registered user part. This is the entry part in to the software.

When the user selects the **information unit** and performance sheet module the following options are displayed for the student.

Class room session

View performance sheet

In the **class room session** part when the subjects are presented to the user, there exist a function called action tracing. This is used to give the access to the user with the left over part when he enters next time, into the classroom. It also gives provision for him to refresh the previous topic and if required it gives options for selecting a different subject. There is a feature in the classroom called the doubts section, which improves the interaction between the student and the information server.

In the case of selection of viewing **performance sheet** it gives data related to the performance in the examination by the student.

When the user selects the **online test module**, the user is given with two options like

Module test.

Full test.

Some special features in both these tests are:

In both these cases the test question will be displayed in a random fashion so that adjacent users attending same test will have a question paper in different order. The same question will not be displayed again if the user has already attended it. If the time lapse occurs then the test access will be cut automatically. Once the test is over the result will be displayed immediately and also the result will be stored permanently in the performance sheet corresponding to the user_id.

When the user clicks on the **library module** a list of library references are displayed for the selected subject in the classroom. These will be linked to other websites based on the request by the user.

If the user selects the **feedback module**, he is given provision for entering both the general and technical comments. The technical comments are verified by the administrator and taken in to consideration for updating available information in the database if found appropriate.

Thus on automizing this project, amount of time and manual work are considerably reduced. The important thing is that the flexibility of the system is increased when compared to the manual system in case of time, repetitive work, guidance, etc.,

System Implementation & Testing

SYSTEM IMPLEMENTATION AND TESTING

1. Implementation:

A crucial phase in the system development is the successful implementation of the new system. Implementation is the process of converting a new system design in to an operational one. This involves creating computer compatible files to store the data, converting the data flow diagrams in to coding and documentation.

The E_INSTITUTION analysis and design is converted in to implementation with the help of language coding conventions. The depth of implementation is found out with the help of output from the implemented software. The main source for testing its accuracy is with the help of testing methodologies.

TESTING:

Testing is a vital process to the success of the system.

DOCUMENTATION:

Normally documentation occurs after the end of every stage of the software lifecycle. After the testing is completed, the whole system must be documented and must be presented in a readable form. This is to ensure that if any corrections, updations and manipulations were to be performed in the future, the users would find no problem in performing those changes. A documentation is also prepared for the source code, report generation programs, table that were used to construct the database, forms used for the screen formats etc.,

2. System Testing:

The system as a whole was tested for the following:

- Validation of inputs
- Referential integrity test
- Sequential tests

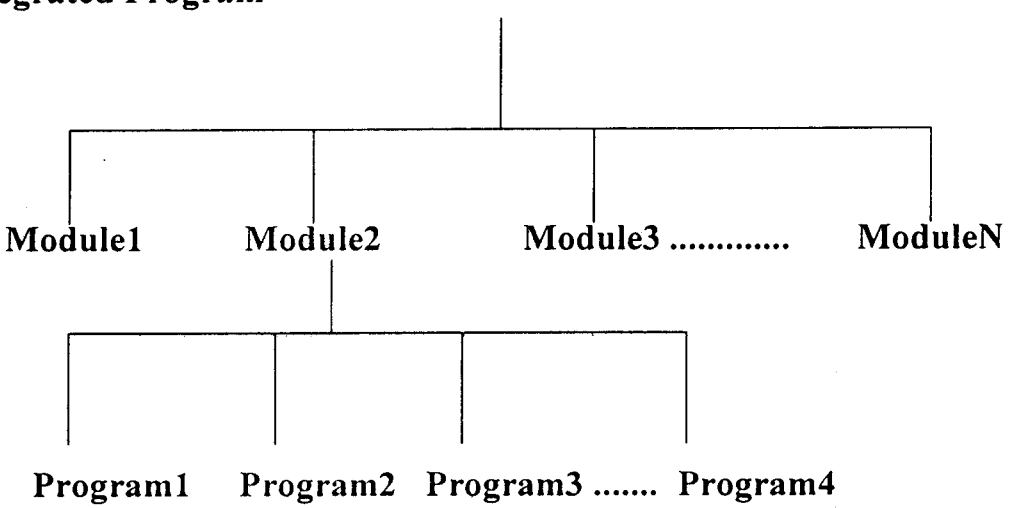
- Consistency of the application

System testing makes a logical assumption that if all the parts of the system are correct, the system will be successful. The objective of testing is to discover errors. To fulfill these objectives a series of tests were planned and executed.

In the case of **E_Institute** two types of test were mainly conducted namely unit testing and integrated testing.

Diagram:

Integrated Program



In the unit testing each individual program were tested using the test data. The output as per the requirements were found satisfactory. Thus it was possible to conclude that every program in the software was functionally correct. As an **illustration in this project** only if the test module works properly the performance sheet will contain the relevant data. Another example is that only if the class room session works properly the login part will properly specify the leftover part for the user when he logs in for the next time. So here we find the modules are interrelated so the unit testing applied to individual modules in an exhaustive fashion will make the whole software work properly.

The individual programs were then combined together to form modules. Integrity tests were performed on each of the modules and again the validity was checked. After that all the modules were brought under a single module and the integrity test was performed again. The result of the test was found to be successful.

This system was validated in such a way that even the slightest deviation in inputting the data will invoke error messages and provide necessary guidelines regarding the input.

Before the software is being released, alpha test is being done by the developers to ensure that the software works properly.

Conclusion

CONCLUSION

The computerization of institutional activities has been made with the intention of making the activities available to the user with ease and provides understandable learning. Thus the software facilitates the user to gain immense knowledge by conducting test based on the level of knowledge possessed by the user. So because of all these activities the drawbacks of the manual system such as manual error, incompatibility for repetition, time delay, workload etc are reduced to great extent.

This package has a graphical user interface in such a way that irrespective of the user's computer familiarity, the user is able to interact with the system easily. All the suggestions forwarded by **nuva** Systems (p) Ltd. in the software proposal have been successfully implemented.

During the design phase of the software many difficulties were encountered. All these difficulties were analyzed deeply and great efforts were taken to bring out an accurate and credible software package.

Scope For Future Enhancement

SCOPE FOR FUTURE ENHANCEMENT

The project has been completed successfully and all the requirements have been met. However the possibilities for renovation are infinite and scope for development innumerable.

The project is designed in such a way that innumerable subjects can be added to the classroom if required without the redesigning of the software. The permission for increasing the number of times to access the test can be increased if required.

Security can be provided for authentication of users entering in to the software by creating a firewall.

The permission for total number of users accessing the software can be increased to infinite if required using the concept of replication of database.

The doubt section can be enhanced so that it can provide more interactivity to the learners.

The performance report functions can be enhanced such that it can instruct the learner to concentrate on the particular area by finding his faults.

System administration can be done to maintain the overall flow of data in the software in a highly protected manner. The job of the administrator can be increased by making him respond to the respective learner based on the feedback received from them.

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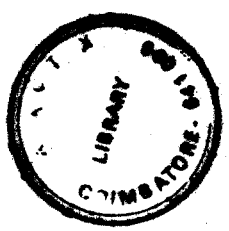

Appendix

Sample Coding

1. Sample Coding:

```
// This code is used to validate the existing user's information.

import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;
import java.util.*;
import java.sql.*;
import java.lang.*;

public class exis_user extends HttpServlet
{
  String uid,pw,QRY,exist,exist1;
  int status;
  String sid,stid,sdes,mdes,s1,m1,ss;
  String suid;
public void init(ServletConfig config) throws ServletException
{
super.init(config);
}

public void doPost(HttpServletRequest req,HttpServletResponse res) throws
ServletException,IOException
{
status=0;
sid=null;
stid=null;

res.setContentType("text/html");
PrintWriter out=res.getWriter();
```

```
uid=req.getParameter("euid");
pw=req.getParameter("eysc");
ss=req.getParameter("subsel");

HttpSession session=req.getSession(true);
session.putValue("+suid+",uid);

Connection con=null;

try
{

Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
con = DriverManager.getConnection("jdbc:odbc:HARIUSER","","");

if(con!=null)
{
 Statement stmt=con.createStatement();

 // HTML page for Entrance Room

 out.println("<html>");
 out.println("<head><title> Entrance Room</title></head>");
 out.println("<body>");

 // TO verify  user id
 ResultSet rs =stmt.executeQuery("Select *"+"From USERLOGIN where
u_id='"+uid+"' and  u_pass='"+pw+"'");
```

```
 while(rs.next())
 {
     out.println("<h1><center>Welcome "+uid+" </center></h1>");
     sid= rs.getString("s_id");
     stid=rs.getString("m_id");
     out.println("<br><br><h1>This gives entire list of subjects in class
room </h1><a href=c:/e_institute/subject_sel.htm>Go To Subject Selection
area</a>");
     status=1;
 }
 rs.close();

 //Result for  illegal user
 if(status==0)
 { out.println("<h1>Dear "+uid+" Permission denied </h1>");
  out.println(" <br><br><h2>Try out with proper User ID and Password
</h2>");
 }


 // For existing users who have attended the class
 if((sid!=null)&&(stid!=null))
 {
  ResultSet rs1 =stmt.executeQuery("Select *"+"From subject Where
s_id='"+sid+"'");
  while(rs1.next())
  {
   sdes=rs1.getString("s_des");
```

```
    }
    rs1.close();

    ResultSet rs2 =stmt.executeQuery("Select *"+"From module Where
m_id='"+stid+"'");
    while(rs2.next())
    {
    mdes=rs2.getString("m_des");

    }
    rs2.close();

    ResultSet rs3 =stmt.executeQuery("Select *"+"From Sub_link");
    while(rs3.next())
    {

 if((rs3.getString("s_id").equals(sid))&&(rs3.getString("m_id").equals(stid)))
      {
       exist=rs3.getString("ht_name");
      }
     }
      rs3.close();
    if(sid.equals("1"))
    {
    exist1="dmoduleselect.htm";
    }
    else
    {
```

```
   exist1="cmoduleselect.htm";
   }
   out.println("<h2>the subject which you have last dealt with is "+sdes+"
and the module is "+mdes+"</h2>");
   out.println("<a href=c:/e_institute/"+exist+">Continue with the left over
topic </a>");
   out.println("<br><h2>if you want to refresh previous modules</h2>");
   out.println("<a href=c:/e_institute/"+exist1+">Go for module selection
</a>");
   }

 }
}

catch(SQLException sqle)
{System.err.println(sqle.getMessage());
}
catch(ClassNotFoundException cnfe)
{
System.err.println(cnfe.getMessage());
}
catch(Exception e)
{
System.err.println(e.getMessage());
}
finally
{
try
```

```
{
if(con!=null)
{
con.close();
}
}
catch(SQLException sqle)
{
System.err.println(sqle.getMessage());
}
}
out.println("</body>");
out.println("</html>");
out.close();
}

public String getServletInfo()
{
return "SampleTrial";
}
}
```

// This code facilitates the user to enter into the software depending on subject selection.

```
import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;
```

```
import java.util.*;
import java.sql.*;
import java.lang.*;

public class dmodule1 extends HttpServlet
{
String t2,sestest;

public void init(ServletConfig config) throws ServletException
{
super.init(config);
}

public void doGet(HttpServletRequest req,HttpServletResponse res) throws
ServletException,IOException
{
t2=req.getParameter("t1");
res.setContentType("text/html");
PrintWriter out=res.getWriter();
Connection con=null;
out.println("html");
out.println("body");

try
{

Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
con = DriverManager.getConnection("jdbc:odbc:HARIUSER","","");
```

```
if(con!=null)
{
HttpSession session=req.getSession(true);
sestest=(String)session.getValue("+suid+");

Statement st=con.createStatement();

st.executeUpdate("UPDATE USERLOGIN " + "SET m_id='"+t2+"'" +
"WHERE u_id ='"+sestest+"'");
if((t2.equals("d11"))||(t2.equals("d12"))
||(t2.equals("d21"))||(t2.equals("d22"))||(t2.equals("d31"))||(t2.equals("d32"))
)
{
res.sendRedirect("c:/e_institute/dmoduleselect.htm");
}
else
{
res.sendRedirect("c:/e_institute/cmoduleselect.htm");
}
}
}
catch(SQLException sqle)
{System.err.println(sqle.getMessage());
}
catch(ClassNotFoundException cnfe)
{
System.err.println(cnfe.getMessage());
}
```

```
catch(Exception e)
{
System.err.println(e.getMessage());
}
finally
{
try
{
if(con!=null)
{
con.close();
}
}
catch(SQLException sqle)
{
System.err.println(sqle.getMessage());
}
}
out.println("/body");
out.println("/html");
out.close();
}

public String getServletInfo()
{
return "SampleTrial";
}
}
```

Sample Forms

Registration Form

Enter User Name:

Enter Your Security Code :

Reconfirm your Password:

Age:

Sex: male

Address for communication:

Phone:

E_Mail ID :

submit reset

Select your area of interest:

DBMS

Display

View My Performance Sheet

The Complete Tutorial for DBMS includes

Go to DMODULE1

Go to DMODULE2

Go to DMODULE3

Back to Subject Selection

cmd1page1

Elementary Topics

Elementary Topics

1. Concept of Integers
2. Concept of variables
    1. Rules for Naming Variables

Concept Of Integers:

C deals with several different kinds of numbers. One of the most frequently used is the whole number,usually called an integer. The integer is one of the basic data types in C.It is characterised by the fact that it does not have either a decimal point or a fractional portion.

Top

Concept Of Variables :

Strings and numeric values can be stored in the memory of the computer for subsequent recall.Whenever the memory is used for this purpose, the programmer must assign a unique name to each such area in memory.If the arbitrary name *number* is used to refer to the area of memory in which a particular value is stored , *number* is called a ***variable.***

Top

Rules for Naming Variables

1. Variable names must begin with a letter of alphabet. In C, the underscore character(_) is considered a letter.
2. The first character may be followed by a sequence of letters and/or digits (0 through 9).

Top

Next

Doubts | Module Select