Easy Education Management System

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Abstract— Digitalization of education system is required now a days. At present, like other sectors, education system is also going digital. Several studies showed that digital education system saves more time and make the education more efficient than previous. There are lots of departments exist in an education system – Personal Information Management, Admission, Attendance, Accounts, Finance, Routine, Results etc. Its a huge work load and time consuming in manual system. If we develop an education management system we can manage our institute more concisely. So, to bring more students and teachers in modern eco system we have to develop the software solution.

1. Project Overview

1.1 Introduction

Now a day's education plays a great role in development of any country. Many of education organizations try to increase education quality. One of the aspects of this improvement is managing of school resources.

Education Management System carried on by any individual or institution engaged in providing a services to students, teachers, guardians and other persons are intermediary that performs one or more of the following functionalities – Student Admission, Employee Registration, Student List, Employee List, Student Attendance, Employee Attendance, Student Routine, Result Management, Payroll & Accounts.

Education Management System (EMS) is such a service which provides all services for an educational institute to make your life easier and faster by assuring its performance. Easy User Management System, Easy Admission Process, Easy Attendance System.

EMS is a system that will provide you a bird's eye view of the functioning of the entire educational institution. It is a management information system helps to manage the different processes in an educational institution like General Administration, Staff Management, Academics, Student Management, and Accounts etc. The information is made using the latest technologies and help's to make decision making a lot faster, effective and easier than ever before. Also helps to improve the overall quality of education of the institution.

We use database and database technology are having a major impact on the growing use of computers. The implementation of the system was done using c# and SQL Server 2012 technologies, allowing system to be run in Windows OS.

In a nutshell, Education Management Software managed your education institution by simplifying and automating processes and addressing the needs of all stakeholders helping them to be more efficient in their respective roles.

1.2 Outline of the Thesis

The overview of related and used technologies in the implementation is given in Chapter 2.

The architecture and way of communication between client and service is explained in Chapter 3.

The detailed information about implementation of the system is presented in Chapter 4.

Chapter 5 provides the summary of the implemented system. The Appendices provides some additional information concerning the system.

1.3 Scope of this application

The difference area where we can use this application as:

- Any education institution makes use of it providing class schedule.
- It can be used in offices and modifications can be easily done according to requirements.

1.4 Focusing of the Project

The system is completed under the guidance of the theory and methods of management information systems, database technology support. This paper first discusses the structure of the background, purpose and significance of the graduate design topics. Then describes the development platform and database technology and the advantages of each, followed by more

devoted a system requirements analysis, design, implementation, and the implementation of the tasks, techniques and tools. End system to complete the information input, output, data modification, query and statistics, as well as print statements, make operation simple and quick.

In this project, we try to build up sound software which can operate any challenging situation in the modern time. Administrator and users information are making effective decisions. The decisions are more accurate, relevant and timely the information stored or process is more effective.

1.5 Features of the Project

The common features of the projects are:

- This is very easy to use for each user.
- Increase Efficiencies and Reduce Costs
- Transform IT for Higher Education
- Easy Solution
- Easy Admission Process
- Secure All Data
- Easy Account Maintenance
- Transaction History
- Easy Attendance Process
- The user of the database can see all information and also can edit if necessary.
- Easy implemented routine for student and teacher's.

1.6 Module of Easy Education Management System

1.6.1 Administration

- System User Group Setup
- System User Setup
- System User Authorization Setup
- Class Setup
- Section Setup
- Student Group Setup
- Subject Setup
- Stuff Designation Setup
- Student Routine Setup
- Student Hall Setup
- Student Seat Setup

1.6.2 Personal Information Management System (PIMS)

i. Student Registration/ Admission
   - Personal Information
   - Guardian Information

ii. Employee/ Stuff Registration
   - Personal Information
   - Academic Information
   - Professional Information
   - Skills/ Training Information

1.6.3 Attendance

- Holiday Setup
- Student Attendance
- Employee / Stuff Attendance

1.6.4 Result

- Student Exam Setup
- Student Exam Result Entry

1.6.5 Accounts

- Debit Head Setup
- Credit Head Setup
- Income
- Expense
- Bank deposit
- Withdraw from Bank

1.6.6 Reports

- Student Daily Attendance
- Student's Result
- Employee/ Staff Attendance
- Student Details

- Student List Report (For Each Class)
- Class Wise Student Routine
- Employee details Report
- Employee/ Stuff List
- All Income By Date
- Head Wise Income By Month
- Head Wise Monthly Income by Financial Year
- All Expense By Date
- Head Wise Expense By Month
- Head Wise Monthly Expense By Year

1.6.7 Students Information to Parents by Easy SMS Service

- Admission Information Confirmation
- Student Attendance Report Each Day (If Not Come)
- Student Attendance Report Each Exam (If Not Come)
- Exam Date Information
- Exam Date Cancel Information

2. Platform Introduction

2.1 Introduction

We use C# (.net framework) and MSSQL Server 2012.

C# is an elegant and type-safe object-oriented language that enables developers to build a variety of secure and robust applications that run on the .NET Framework. You can use C# to create Windows client applications, XML Web services, distributed components, client-server applications, database applications, and much, much more. Visual C# provides an advanced code editor, convenient user interface designers, integrated debugger, and many other tools to make it easier to develop applications based on the C# language and the .NET Framework.

The .NET Framework (pronounced dot net) is a software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large class library known as Framework Class Library (FCL) and provides language interoperability (each language can use code written in other languages) across several programming languages. Programs written for .NET Framework execute in a software environment (as contrasted to hardware environment), known as Common Language Runtime (CLR), an application virtual machine that provides services such as security, memory management, and exception handling. FCL and CLR together constitute .NET Framework.

2.2 C# Features

- C# is a simple, modern, object oriented language derived from C++ and Java.
- It aims to combine the high productivity of Visual Basic and the raw power of C++.
- It is a part of Microsoft Visual Studio7.0.
- Visual studio supports Vb,VC++,C++,Vbscript, Jscript. All of these languages provide access to the Microsoft .NET platform.
- .NET includes a Common Execution engine and a rich class library.
- Microsofts JVM eqiv is Common language run time (CLR).
- CLR accommodates more than one languages such as C#, VB.NET, Jscript, ASP.NET,C ++.
- Source code --->Intermediate Language code (IL) ---> (JIT Compiler) Native code.
- The classes and data types are common to all of the .NET languages.
- We may develop Console application, Windows application, and Web application using C #.
- In C# Microsoft has taken care of C++ problems such as Memory management, pointers etc.
- It supports garbage collection, automatic memory management and a lot.

2.3 Database Platform

A database is an organized collection of data. The data is typically organized to model aspects of reality in a way that supports processes requiring information, such as modeling the availability of rooms in hotels in a way that supports finding a

hotel with vacancies.

Database management systems (DBMS) are computer software applications that interact with the user, other applications, and the database itself to capture and analyze data. A general-purpose DBMS is designed to allow the definition, creation, querying, update, and administration of databases. Well-known DBMSs include MySQL, PostgreSQL, Microsoft SQL Server, Oracle, Sybase and IBM DB2.

2.4 SQL Server database Introduction

In computing, Microsoft SQL Server is a relational database management system, currently developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications which may run either on the same computer or on another computer across a network (including the Internet).

Microsoft markets at least a dozen different editions of Microsoft SQL Server - aimed at different audiences and for workloads ranging from small single-machine applications to large Internet-facing applications with many concurrent users.

2.5 SQL Server database system features

- Supports most administrative tasks for SQL Server.
- A single, integrated environment for SQL Server Database Engine management and authoring.
- Dialogs for managing objects in the SQL Server Database Engine, Analysis Services, and Reporting Services, that allows you to execute your actions immediately, send them to a Code Editor, or script them for later execution.
- Non-modal and resizable dialogs allow access to multiple tools while a dialog is open.
- A common scheduling dialog that allows you to perform action of the management dialogs at a later time.
- Exporting and importing SQL Server Management Studio server registration from one Management Studio environment to another.
- Save or print XML Show plan or Deadlock files generated by SQL Server Profiler, review them later, or send them to administrators for analysis.
- A new error and informational message box that presents much more information, allows you to send Microsoft a comment about the messages, allows you to copy messages to the clipboard, and allows you to easily e-mail the messages to your support team.
- An integrated Web browser for quick browsing of MSDN or online help.

3. System Analysis

3.1 Introduction

Systems analysis is a problem solving technique that decomposes a system into its component pieces for the purpose of the studying how well those component parts work and interact to accomplish their purpose. As the software system requirements were predictable, it is decided to follow the classical system development life cycle method. This process demands a systematic, sequential approach to software development that begins at the system level and progress through analysis, design, coding, testing and maintenance. The steps that is applicable to all software engineering paradigms. The program is followed by SDLC (Software Development Life Cycle)

3.2 System Engineering and Analysis

Software is always a part of a large system; work begins by establishing requirement for all system elements and then allocating some subsets of this requirement to software. This system view is essential when software must interface with other elements such as hardware, people and database. System engineering and analysis encompasses requirements gathering at the system level with a small amount of top-level design analysis.

3.3 System Analysis

Analysis involves the requirement determination and specification. Systems analysis is a problem solving technique that decomposes a system into its component pieces for the purpose of the studying how well those component parts work and interact to accomplish their purpose. According to the Merriam-Webster dictionary, systems analysis is the process of studying a procedure or business in order to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way. Analysis and synthesis, as scientific methods, always go hand in hand, they complement one another.

3.4 Requirement Analysis

Requirements analysis in systems engineering and software engineering, encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements.

Requirements analysis is critical to the success of a systems or software project. The requirements should be documented, actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design.

3.5 Software Requirements

- Microsoft windows XP/ Windows 7/ Windows Vista/ Windows 8/ Windows 10/ Windows Server 2003, 2008, 2012.
- Visual Studio 2012 should be installed.
- .Net framework should be installed, Crystal report should be installed for report view (visual studio package not installed in OS).
- MSSQL Server 2012 should be installed.

3.6 Language USED

- C# in front end
- .Net Framework
- MS SQL Server DBMS (backend database)

3.7 Flow Chart

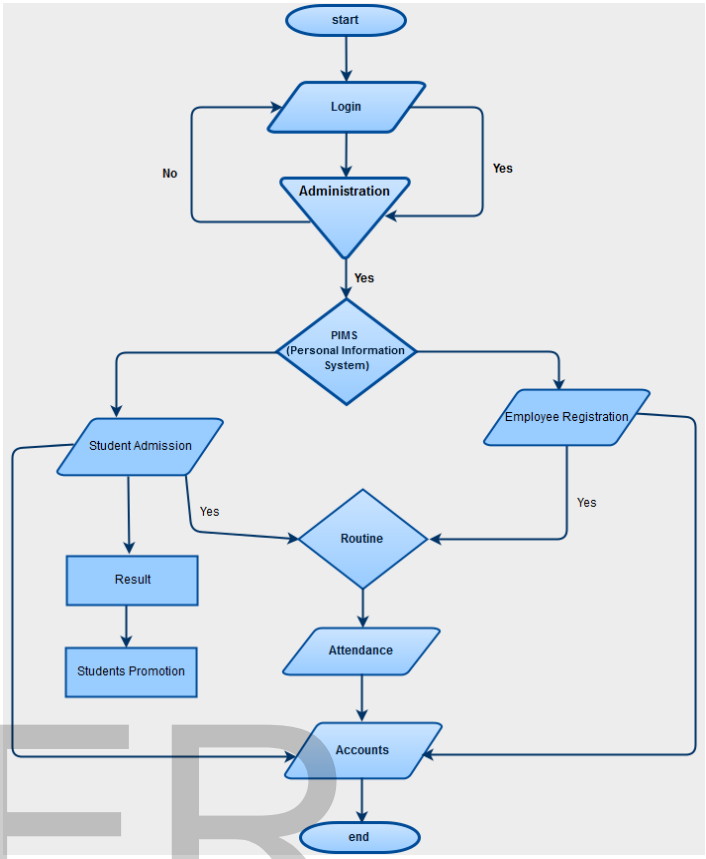
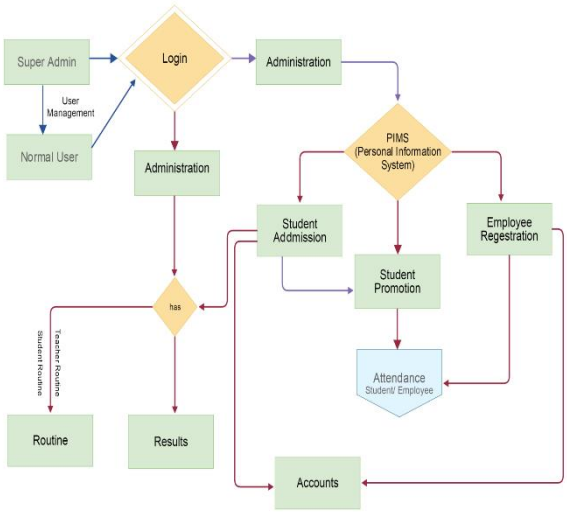


Figure 0: Flow Chart

3.8 Data Flow Diagram (DFD)



1: DFD Diagram

3.9 ER Diagram

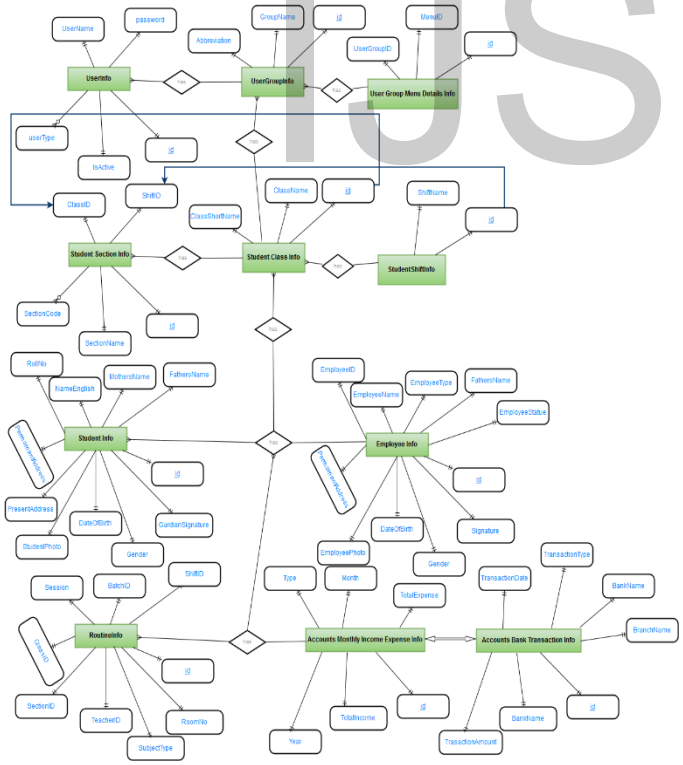


Figure 2: ER Diagram

3.10 Relational Database

3.10.1 User

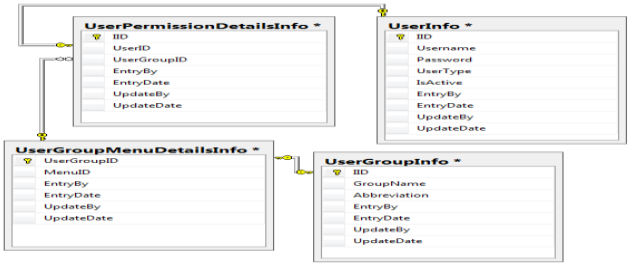


Figure 3: User Relational Database

3.10.2 Administration

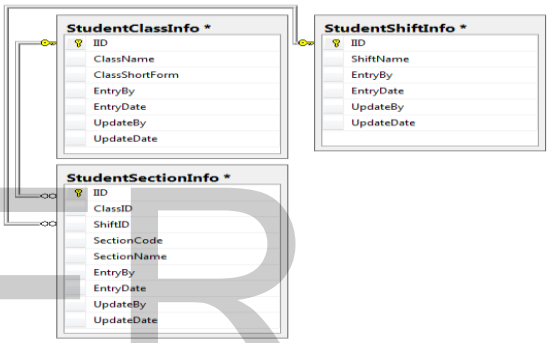


Figure 4: Administration Relational Database

3.10.3 Student

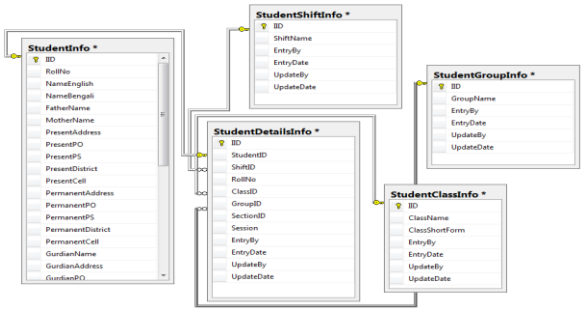


Figure 5: Student Relational Database

3.10.4 Employee

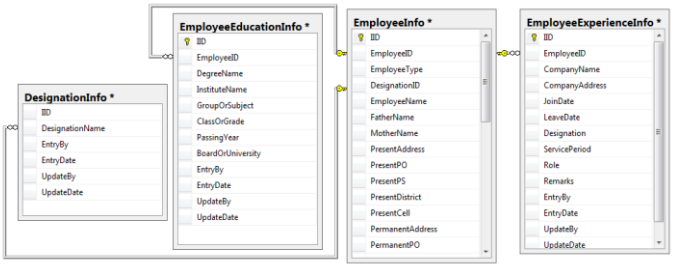


Figure 6: Employee Relational Database

3.10.5 Routine

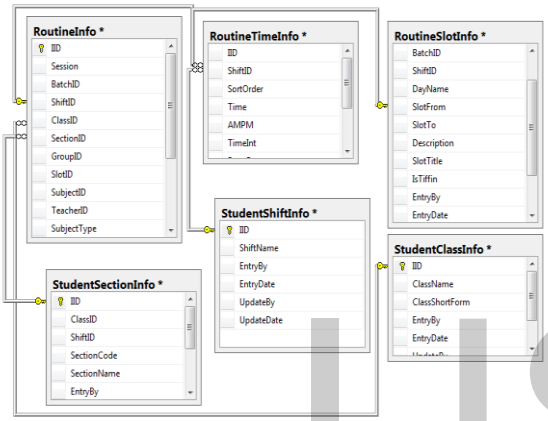


Figure 7: Routine Relational Database

4. System Design & Coding Structure

4.1 Introduction

The design phase is concerned with the physical construction of the system. Included are the design or configuration of the network (hardware, operating system, programming, etc.), design of user interfaces (forms, reports, etc.), design of system interfaces (for communication with other systems), and security issues. It is important that the proposed design be tested for performance, and to ensure that it meets the requirements outlined during the analysis phase. In other words, the main objective of this phase is to transform the previously defined requirements into a complete and detailed set of specifications which will be used during the next phase. Some of the activities that need to take place during the design phase are:

- Design the application
- Design and integrate the network
- Design and integrate the database
- Create a contingency plan
- Start a Maintenance, Training and Operations plan
- Review the design
- Articulate the business processes and procedures
- Establish a transition strategy
- Deliver the System Design Document
- Review final design

A database system is essentially nothing more than a computerized record keeping system the database itself can be regarded as kind of electronic filing cabinet. A database consists of same collection of some collection of persistent data that is used by the applications system of given some instituted. The term “instituted” here is simply a convenient generic term for any reasonable self- contained science, technical or other institution.

4.2 Database Design

A database management system (DBMS) is a collection of programs that enables you to store, modify, and extract information from a database. There are many different types of database management systems, ranging from small systems that run on personal computers to huge systems that run on mainframes.

DBMS is a software that handles the storage, retrieval, and updating of data in a computer system.

Ex- SQL Server (Microsoft), MySQL (Freeware), Oracle (Oracle), NoSQL (Oracle), NonStop SQL (Hewlett Packard)

4.3 System Architecture Design

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

System architecture can comprise system components, the

externally visible properties of those components, the relationships (e.g. the behavior) between them. It can provide a plan from which products can be procured, and systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called architecture description languages.

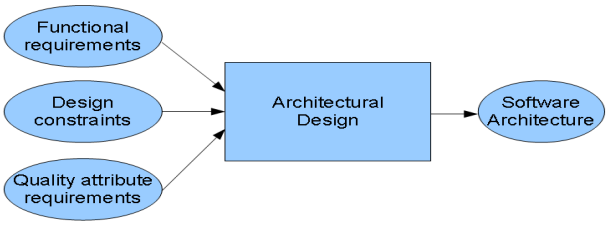


Figure 8: Software Architecture Design

Software architecture refers to the high level structures of a software system, the discipline of creating such structures, and the documentation of these structures. It is the set of structures needed to reason about the software system. Each structure comprises software elements, relations among them, and properties of both elements and relations. The architecture of a software system is a metaphor, analogous to the architecture of a building.

4.4 Code Design

Design patterns are solutions to software design problems you find again and again in real-world application development. Patterns are about reusable designs and interactions of objects.

The 23 Gang of Four (GoF) patterns are generally considered the foundation for all other patterns. They are categorized in three groups: Creational, Structural, and Behavioral (for a complete list see below).

To give you a head start, the C# source code for each pattern is provided in 2 forms: structural and real-world. Structural code uses type names as defined in the pattern definition and UML diagrams. Real-world code provides real-world programming situations where you may use these patterns.

A third form, .NET optimized, demonstrates design patterns that fully exploit built-in .NET 4.5 features, such as, generics, attributes, delegates, reflection, and more. These and much more are available in our .NET Design Pattern Framework 4.5.

This structural code demonstrates the Singleton pattern which assures only a single instance (the singleton) of the class can be created.

This real-world code demonstrates the Singleton pattern as a Load Balancing objects. Only a single instance (the singleton) of the class can be created because servers may dynamically come on-or off-line and every request must go through the one object that has knowledge about the state of the (web) farm.

4.5 Sample Code

4.5.1 Form Login

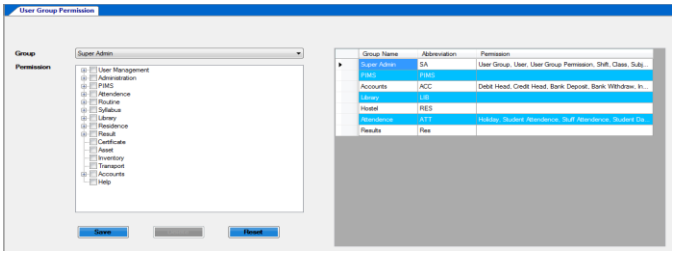
Design:

Code:

```
private void Login()
        {
            try
            {
                if (IsValid())
                {
                    UserInfo    _user    =
DataAccessFacade.Instance.GetUserIn-
foForLogin(txtUserName.Text.Trim(),
txtPassword.Text.Trim());
                    if (_user != null &&
string.Compare(txtPassword.Text.Trim(),
_user.Password.ToString().Trim()) == 0)
                    {
                        if   (_user.IsAc-
tive.ToUpper() == "YES")
                        {
                            Main-
Form.LoggedUser = _user;
```

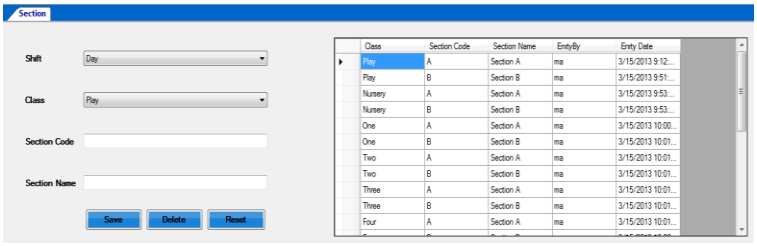
4.5.2 User Group Permission

Design:



Code:

```
private void btnSave_Click(object sender, Even-
tArgs e)
        {
            try
            {
                DataTable    dtMenu    =    new
DataTable();
                dtMenu.Columns.Add(new
DataColumn("MenuID", typeof(long)));
                foreach   (TreeNode   parentNode
in tvPermission.Nodes)
                {
                    foreach   (TreeNode   tn   in
parentNode.Nodes)
                    {
                        if  (tn.Nodes.Count  ==
0)
                        {
                            if (tn.Checked)
                            {
                                DataRow row1 =
dtMenu.NewRow();
                                row1["MenuID"]
= Convert.ToInt64(tn.Name);
dtMenu.Rows.Add(row1);
                            }
                        }
                        else
                        {
                            foreach   (TreeNode
lastNode in tn.Nodes)
                            {
                                if      (last-
Node.Checked)
                                {
                                    DataRow
```



Code:

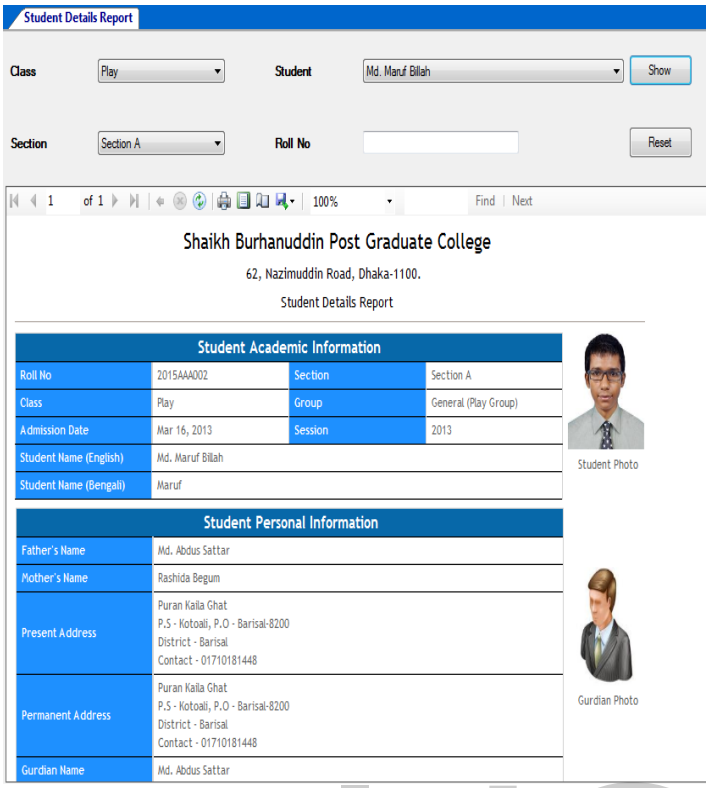
```
private void btnSave_Click(object sender, Even-
tArgs e)
        {
            try
            {
                if (IsValid())
                {
                    StudentSectionInfo      _Stu-
dentSectionInfo = CreateDTO();
                    if            (string.IsNul-
lOrEmpty(lblID.Text.Trim()))
                    {
                        if  (DataAccessFacade.In-
stance.IsExist("StudentSectionInfo", " ClassID =
"  +  _StudentSectionInfo.ClassID.ToString()  +  "
AND SectionCode = '" + _StudentSectionInfo.Sec-
tionCode + "'"))
                        {
                            Message-
Box.Show("Record already exists.", Configuration-
Manager.AppSettings["MessageBoxCaption"]);
                            return;
                        }

                        if  (DataAccessFacade.In-
stance.InsertStudentSectionInfo(_StudentSection-
Info))
                        {
                            ClearUIControls();
                            LoadGrid();
                            Message-
Box.Show("Saved Successfully", ConfigurationMan-
ager.AppSettings["MessageBoxCaption"]);
                        }
                        else
                        {
                            MessageBox.Show("Not
```

4.5.3 Section Entry

Design:

4.5.4 Students Details Report

Design:



Code:

```
public void LoadStudent()
        {
            cmbStudent.DataSource = null;
            //cmbStudent.Items.Clear();
            if (cmbSection.SelectedIndex != -1)
            {
                string whereClause = " ClassID
=  "  +  ((StudentClassInfo)cmbClass.SelectedI-
tem).IID.ToString() + " AND SectionID = " +
((StudentSectionInfo)cmbSection.SelectedI-
tem).IID.ToString() + " ";

                DataTable dtStudent = DataAc-
cessFacade.Instance.GetBySPWithParams(DBCon-
stants.SP_GET_ALL_STUDENT_FOR_DROPDOWN, new ob-
ject[] { whereClause });
                if (dtStudent.Rows.Count > 0)
                {
                    cmbStudent.DisplayMember  =
"NameEnglish";
                    cmbStudent.ValueMember    =
"IID";
                    cmbStudent.DataSource     =
```

4.6 Distinguishing Features of C#

4.6.1 Portability

By design, C# is the programming language that most directly reflects the underlying Common Language Infrastructure (CLI). Most of its intrinsic types correspond to value-types implemented by the CLI framework. However, the language specification does not state the code generation requirements of the compiler: that is, it does not state that a C# compiler must target a Common Language Runtime, or generate Common Intermediate Language (CIL), or generate any other specific format. Theoretically, a C# compiler could generate machine code like traditional compilers of C++ or FORTRAN.

4.6.2 Namespace

A C# namespace provides the same level of code isolation as a Java package or a C++ namespace, with very similar rules and features to a package.

4.6.3 Memory access

In C#, memory address pointers can only be used within blocks specifically marked as unsafe, and programs with unsafe code need appropriate permissions to run. Most object access is done through safe object references, which always either point to a "live" object or have the well-defined null value; it is impossible to obtain a reference to a "dead" object (one that has been garbage collected), or to a random block of memory.

4.6.4 Exception

Checked exceptions are not present in C# (in contrast to Java). This has been a conscious decision based on the issues of scalability and version ability.

4.6.5 Polymorphism

Unlike C++, multiple inheritances is not supported by C#, although a class can implement any number of interfaces. This was a design decision by the language's lead architect to avoid complication and simplify architectural requirements throughout CLI. When implementing multiple interfaces that contain a method with the same signature, C# allows the programmer to implement each method depending on which interface that method is being called through, or, like Java, allows the programmer to implement the method once and have that be the single invocation on a call through any of the class's interfaces.

4.6.6 *Methods and functions*

Like C++, and unlike Java, C# programmers must use the keyword virtual to allow methods to be overridden by subclasses.

Extension methods in C# allow programmers to use static methods as if they were methods from a class's method table, allowing programmers to add methods to an object that they feel should exist on that object and its derivatives.

4.6.7 *User Interface Design*

User interface design (UI) or user interface engineering is the design of user interfaces for machines and software, such as computers, home appliances, mobile devices, and other electronic devices, with the focus on maximizing the user experience. The goal of user interface design is to make the user's interaction as simple and efficient as possible, in terms of accomplishing user goals (user-centered design).

Good user interface design facilitates finishing the task at hand without drawing unnecessary attention to it. Graphic design and typography are utilized to support its usability, influencing how the user performs certain interactions and improving the aesthetic appeal of the design; design aesthetics may enhance or detract from the ability of users to use the functions of the interface.

Figure 9: User Interface

5. SYSTEM IMPLEMENTATION

5.1 System implementation

Implementation refers to the final process of moving the solution from development status to production status. Depending on your project, this process is often called deployment, go-live, rollout or installation. For the purposes of Life cycle Step, all of these terms are synonymous with "implementation."

There is no single way to implement an application. It depends on the characteristics of your project and the solution. Some implementations are as easy as saying “we are now live.” This type of implementation can work when the solution is brand new and you are developing and testing in what will become the production environment. In these cases, implementation is just a state of mind. One day the solution is in development, and the next day it is in production.

5.2 User Training

The initial training classes for users are held, and training materials are delivered at the classes. Some help desk personnel should attend the initial user training class. More training classes can be scheduled later, as new personnel start using the application. Training is done on the user acceptance test system, accessing the test database or a special training database.

5.3 Distributed User Documentation

User documentation that was finalized in User Acceptance Testing is now distributed and in the users' possession.

5.3.1 *Finalized System Documentation*

System documentation corrected with all updates from the testing phases is handed over to production support.

5.3.2 *Installed Production System*

The production system is installed in the appropriate production environment or on the appropriate production server, and on any client workstations that require it.

5.3.3 *Post-Implementation Review Summary*

This report is produced after the post-implementation review meeting, and contains a summary of the project success criteria that were met, success criteria that were not met and reasons for the problem, what we can learn from the project to improve practices for the next project. In particular, the report should identify any techniques or practices used in this project that worked extremely well, and which the project team feels would benefit current and future projects.

5.3.4 *Methodology Compliance Form*

This form is initialized by the project team, and completed by a methodology representative who has reviewed the project documentation and found it acceptable. It is completed in Word.

5.4 Software deployment

Software deployment is all of the activities that make a software system available for use. The general deployment process consists of several interrelated activities with possible transitions between them. These activities can occur at the producer side or at the consumer side or both. Because every software system is unique, the precise processes or procedures within each activity can hardly be defined. Therefore, "deployment" should be interpreted as a general process that has to be customized according to specific requirements or characteristics. A brief description of each activity will be presented later.

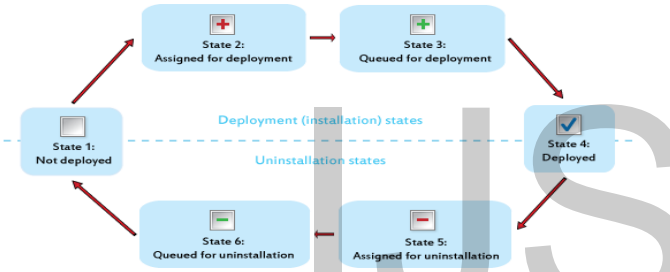


Figure 10: Deployment Process

5.5 Deployment Activities

5.5.1 *Release*

The release activity follows from the completed development process. It includes all the operations to prepare a system for assembly and transfer to the customer site. Therefore, it must determine the resources required to operate at the customer site and collect information for carrying out subsequent activities of deployment process.

5.5.2 *Install and activate*

Activation is the activity of starting up the executable component of software. For simple systems, it involves establishing some form of command for execution. For complex systems, it should make all the supporting systems ready to use. (Not to be confused with the common use of the term activation concerning a software license, which is a function of Digital Rights Management system.)

In larger software deployments, the working copy of the software might be installed on a production server in a production environment. Other versions of the deployed software may be installed in a test environment, development environment and disaster recovery environment.

Further information: Installation (computer programs)

5.5.3 *Deactivate*

Deactivation is the inverse of activation, and refers to shutting down any executing components of a system. Deactivation is often required to perform other deployment activities, e.g., a software system may need to be deactivated before an update can be performed. The practice of removing infrequently used or obsolete systems from service is often referred to as application retirement or application decommissioning.

5.5.4 *Adapt*

The adaptation activity is also a process to modify a software system that has been previously installed. It differs from updating in that adaptations are initiated by local events such as changing the environment of customer site, while updating is mostly started from remote software producer.

5.5.5 *Update*

The update process replaces an earlier version of all or part of a software system with a newer release.

5.5.6 *Built-In*

Mechanisms for installing updates are built into some software systems. Automation of these update processes ranges from fully automatic to user initiated and controlled. Norton Internet Security is an example of a system with a semi-automatic method for retrieving and installing updates to both the antivirus definitions and other components of the system. Other software products provide query mechanisms for determining when updates are available.

5.5.7

5.5.8 *Version tracking*

Version tracking systems help the user find and install updates to software systems installed on PCs and local networks.

- Web based version tracking systems notify the user when updates are available for software

systems installed on a local system. For example: Version Tracker Pro checks software versions on a user's computer and then queries its database to see if any updates are available.

- Local version tracking system notifies the user when updates are available for software systems installed on a local system. For example: Catalog stores version and other information for each software package installed on a local system. One clicks of a button launches a browser window to the upgrade web page for the application, including auto-filling of the user name and password for sites that require a login.
- Browser based version tracking systems notify the user when updates are available for software packages installed on a local system.

5.5.9 Uninstall

Uninstallation is the inverse of installation. It is the removal of a system that is no longer required. It also involves some reconfiguration of other software systems in order to remove the uninstalled system's files and dependencies.

5.5.10 Retire

Ultimately, a software system is marked as obsolete and support by the producers is withdrawn. It is the end of the life cycle of a software product.

6. SYSTEM TEST

6.1 Software Testing

Software testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques include the process of executing a program or application with the intent of finding software bugs (errors or other defects).

It involves the execution of a software component or system component to evaluate one or more properties of interest. In general, these properties indicate the extent to which the component or system under test:

- Meets the requirements that guided its design and development,
- Responds correctly to all kinds of inputs,
- Performs its functions within an acceptable time,
- Is sufficiently usable,
- Can be installed and run in its intended environments, and
- Achieves the general result its stakeholder's desire.

6.2 Principles of software testing

Principle 1: Testing shows that there are defects present in the software
A self-explanatory point, it states that when a project is tested, it is checked for possible defects or bugs by creating different software testing strategies.

Principle 2: Testing software exhaustively is impossible.
This means that testing software is not possible exhaustively and instead, testers need optimum time to test an application, which is based on the risk assessment of the same.

Principle 3: Testing software early.
It is imperative to start testing software as early as possible. This ensures that the defects can be captured and fixed within the stipulated time-frame, thereby allowing developers to deliver the software to the clients on time.

Principle 4: Clustering the defects.
Defect clustering simply state that a small number of

modules in an application contains maximum defects detected.

Principle 5: The Pesticide Paradox.
When the same tests are repeated over time and again, then the test cases do not find any new bugs. This situation gives rise to a new principle known as the Pesticide Paradox. However, this can be over-come by reviewing and revising the test cases and adding new and different test cases.

Principle 6: Testing is dependent on context.
This means that when you test a mobile application, it will be on different grounds than while testing a web application. Similarly, testing a Mac application will be different than testing an Android application and the likes.

Principle 7: Absence of errors – fallacy.
This principle merely points out to the fact that finding and fixing defects in a software system is of no use if the system build in itself is unusable and is unable to meet the users' needs and requirements.

7. TABLE INFORMATION

7.1 User Table

UserInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
Username	varchar(50)	
Password	varchar(50)	
UserType	varchar(50)	
IsActive	varchar(50)	
EntryBy	varchar(50)	✓
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

UserPermissionDetailsInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
UserID	bigint	
UserGroupID	bigint	
EntryBy	varchar(50)	✓
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

7.2 User Group Table

UserGroupInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
GroupName	varchar(100)	
Abbreviation	varchar(20)	✓
EntryBy	varchar(50)	✓
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

UserGroupMenuDetailsInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
UserGroupID	bigint	
MenuID	bigint	✓
EntryBy	varchar(50)	✓
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

7.3 Menu Table

MenuInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
Caption	varchar(100)	
MenuName	varchar(100)	
FormName	varchar(200)	
IsParent	bit	
ParentID	bigint	✓
EntryBy	varchar(50)	✓
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

7.4 Routine Table

RoutineSlotInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
Session	varchar(50)	
BatchID	bigint	
ShiftID	bigint	
DayName	varchar(15)	
SlotFrom	decimal(18, 2)	
SlotTo	decimal(18, 2)	
Description	varchar(50)	✓
SlotTitle	varchar(50)	✓
IsTiffin	bit	
EntryBy	varchar(50)	✓
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

RoutineInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
Session	varchar(50)	
BatchID	bigint	✓
ShiftID	bigint	✓
ClassID	bigint	
SectionID	bigint	
GroupID	bigint	
SlotID	bigint	
SubjectID	bigint	
TeacherID	bigint	
SubjectType	varchar(50)	
RoomNo	varchar(50)	✓
EntryBy	varchar(50)	
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

7.5 Student Progress Table

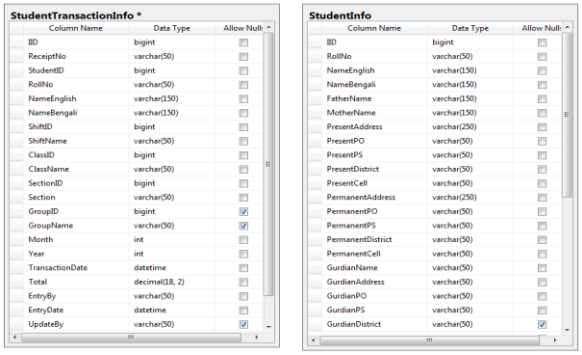
StudentProgressHistory

Column Name	Data Type	Allow Nulls
IID	bigint	
StudentID	bigint	
Shift	varchar(50)	
RollNo	bigint	
Class	varchar(50)	
[Group]	varchar(50)	
Section	varchar(50)	
Session	varchar(50)	
Grade	varchar(50)	
TotalMarks	decimal(18, 2)	
NumberOfFail	int	✓
EntryBy	varchar(50)	
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

StudentPrevBackgroundInfo

Column Name	Data Type	Allow Nulls
IID	bigint	
StudentID	bigint	
ExamName	varchar(50)	
InstituteName	varchar(100)	
Board	varchar(50)	
[Group]	varchar(50)	
RegNo	varchar(50)	
Grade	varchar(50)	✓
PassingYear	int	
EntryBy	varchar(50)	
EntryDate	datetime	
UpdateBy	varchar(50)	✓
UpdateDate	datetime	✓

7.6 Student Table



8. Output & Operation Mechanism

8.1 Login

After installing the software system user might be treated as a public user. The user only can see three functional tools bar named File, View and help. When the user clicks into option Login, A Login form appears there into interface. User has to enter the User-ID and Password to login. After typing all required info's user have to enter login.

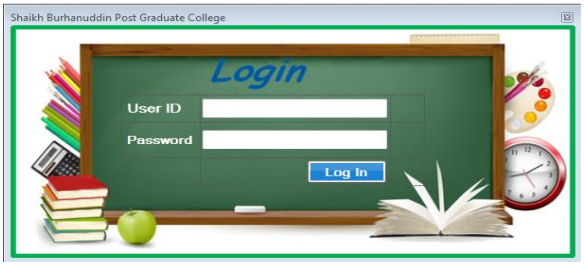


Figure 11: Login Process

The user must have logged in into there to have the full access. Into File tools bar there are six objective options, where the first option is Login. After Login user can see and access with all other functionalities.

8.2 User Management

This system shows all the functionalities of a User. They Are user Group, Group Permission and User Entry.

Figure 12: Administration

8.2.1 User Group

The User can Create or Delete any User Groups. User can also Reset the existing user Groups. User needs just a Group name and abbreviation for Creating a User Group. When a User finished creating a User Group, It appears at the right side of the User Group Form with its Entry by and Entry Date.

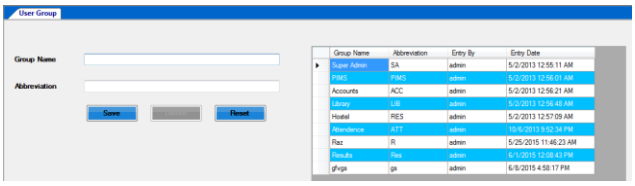


Figure 13: User Group Entry

8.2.2 Group permission

The Groups, user created into the User group can't access into all the sections. A User Group can access only those sections whose are given. All User Groups cannot access all sections. So How many sections and which sections are permitted to be accessed by a User Group is Decided here.

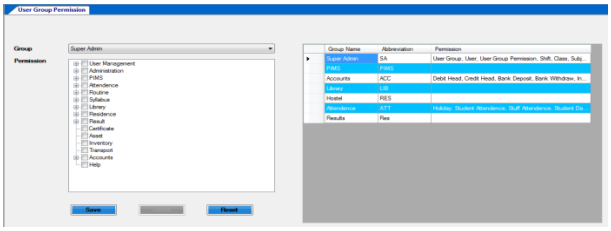


Figure 14: Group Permission

8.2.3 User Entry

The Super admin can add other users into this system if necessary. It is quite foggy to manage all the systems alone, so user can add several users. There just needs a valid User-name and a password. User must select the Sections which are permitted to that New User.

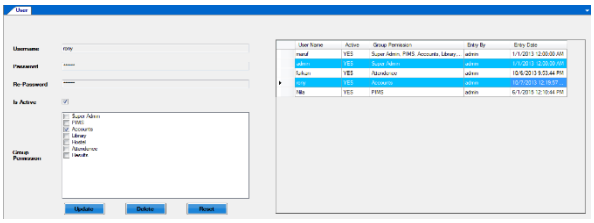


Figure 15: User Entry

The User can be active or non-active. After creating the User-Ids, it will appear into the right side of the form with some relational information's active, group permission, Entry By and Entry date. We can also reset/Update the info's if needed.

8.3 Administration

The system management shows all the functionalities of arranging and organizing classes, shifts and sections in a polite and easy way. It shows shifts, classes, sections, subject groups, group subjects and designation when necessary to know.

Figure 16: Administration

8.3.1 Shift

It shows the shifts of any school management system. It May b Day or Morning. Nowadays some Institutions are now started night shifts also.

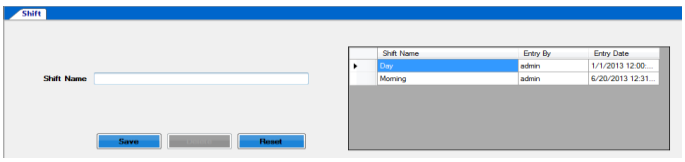


Figure 17: Shift Entry

8.3.2 Class

This UI is for enter all existing class in an educational institute. We also assign a Class Short for easy handling.

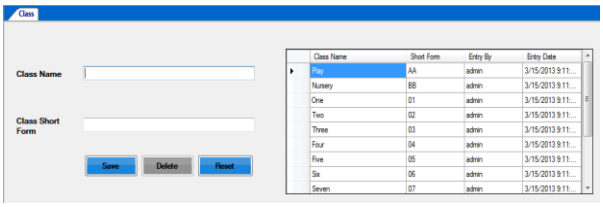


Figure 18: Class Entry

8.3.3 Subject

This is Input screen for enlistment of subject with subject code and subject type alike – subjective/ selective.

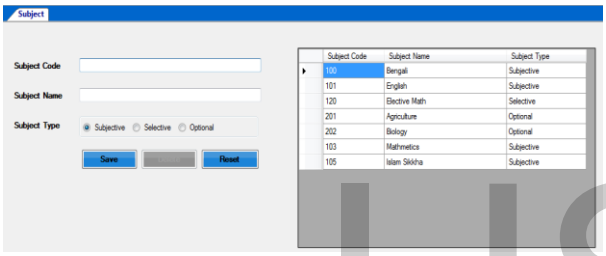


Figure 19: Subject Entry

8.3.4 Section

User can see all the sections of all classes with their individual section codes. If the user wants to add a new section for any identical class and shifts it needs just a section name with its section codes. After saving it will appear into the right side of user interface. User also can delete or reset any section data if needed.

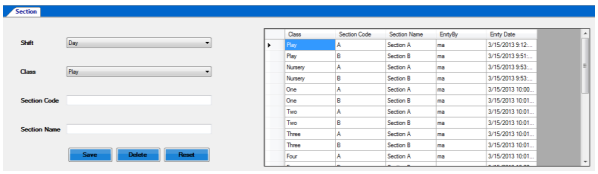


Figure 20: Section Entry

8.3.5 Student Group

Student group shows the group of any student. User can create any user group with just only a Group-name. Usually there are 3 student groups named Science, Business Communication and Humanities.

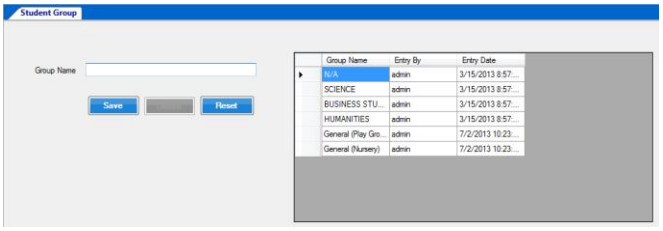


Figure 21: Student Group Entry

8.3.6 Group Subjects

We assign subject name for under subjective, Selective and optional just select particular class and group.

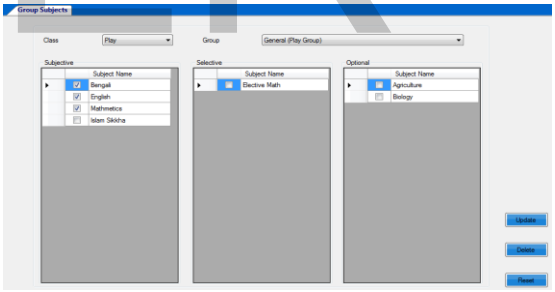


Figure 22: Student Group Entry

8.3.7 Designation

Designation means those, with whose strong monitoring and love a institution runs properly. With the help of this, User could see the entire designations name at a time. User can add other designation name according to necessity. User also can reset or delete the previous data/record if needed.

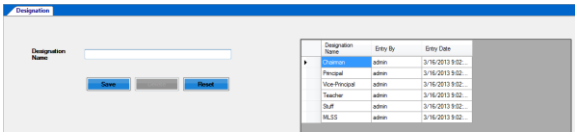


Figure 23: Designation

8.4 Attendance

8.4.1 Student Attendance

This system shows the student attendance. If the User just want to check any required class's and section's student's attendance of a desired day, User only have to enter the class name, section name and that date, Ant may b the attendance report of a huge number of students would be shown in a couple of minutes. User can save, delete or reset the data's if needed.

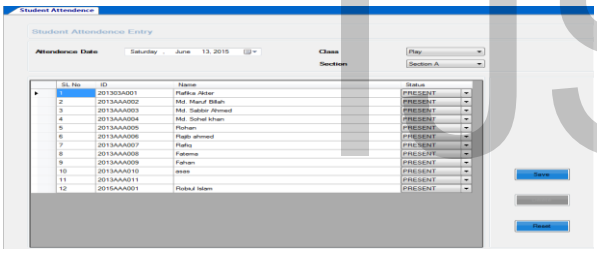


Figure 24: Attendance Screen

8.4.2 Employee Attendance

This functionality shows all of the employee's attendance as like students and input attendance.

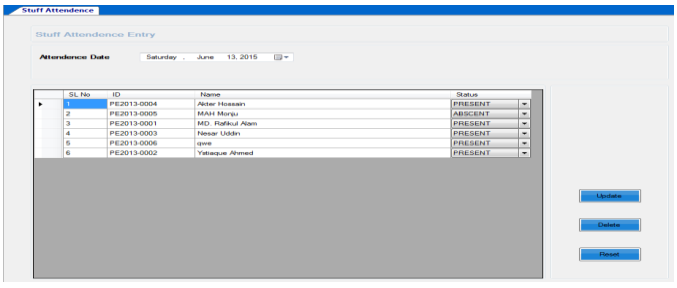


Figure 25: Employee Attendance

8.4.3 Holidays

Holiday input screen is for institute can inputted their festival time and weekend for easy to concern anybody with short notes about it like remarks. Friday is by default holiday.

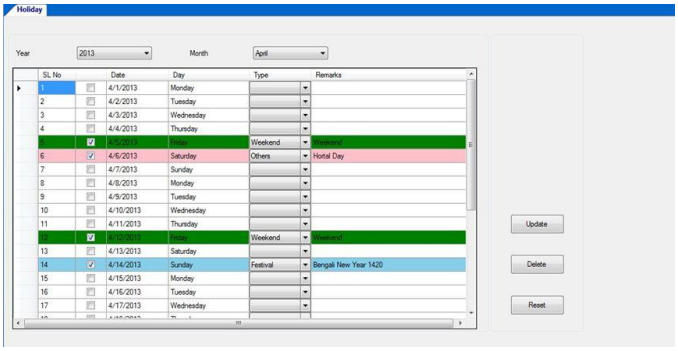


Figure 26: Enter Holidays

8.5 PIMS (Personal Information Module System)

This Functionality represents Personal Information Module System. It includes/shows all kind of student and employee in information, personal or professional. Student Admission, Student promotion, Employee Registration, Student List, Employee List, Student Details report, student list Report, Employee Details Report and Employee List report all are given here if needed.

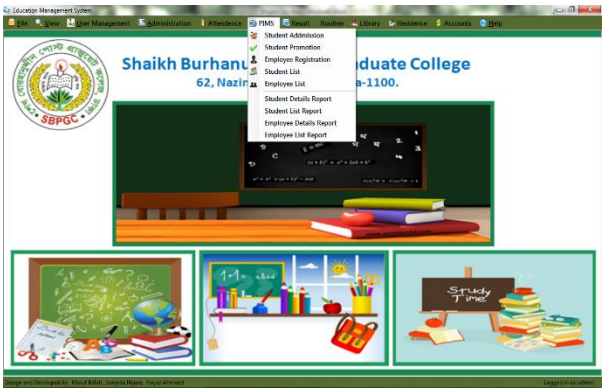


Figure 27: PIMS

8.5.1 Student Admission

As this is a School management System there must be students, and also there must have an organized way to admit them. At here, User can admit students with fulfilling this form. After getting into all information user can save them as students of that institutions. It also includes Students photo on it. It's easy to identify. Guardian's information is available with mobile number and photo.

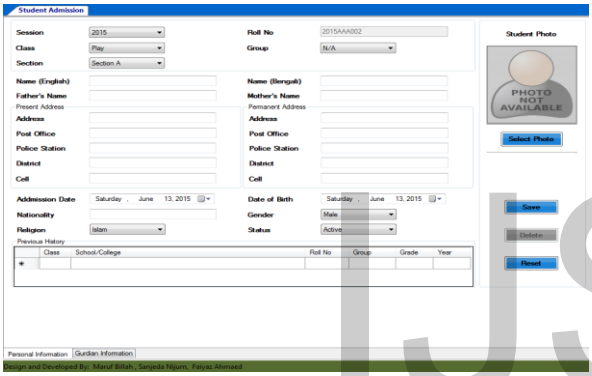


Figure 28: Student Admission

8.5.2 Employee Registration

Admin can Register Employs according to necessity of management system. User can also update/Reset the old employ's data's if necessary. It saves the employs photo and digital signature which is more secure and identical.

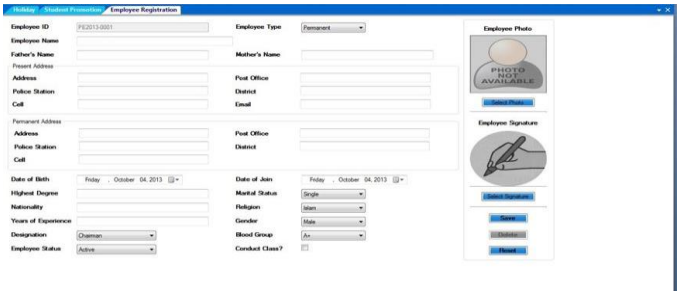


Figure 29: Employee Registration

8.5.3 Student List

Admin / User can watch the student list. According to a School Management system, there are a lot of Students. So, may be User want to watch only some selective students list. As it, users have just input the required class and section onto it and here result comes. Admin can edit any information from here just click edit button and update data.

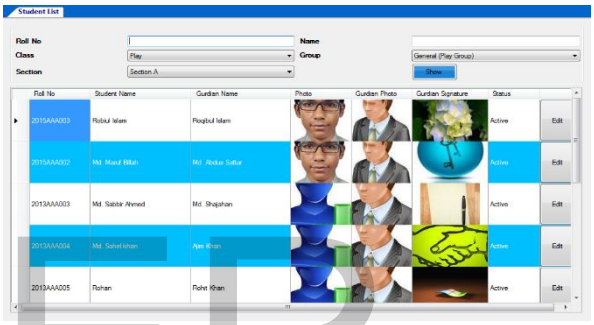


Figure 30: Student List

8.5.4 Employee List

It shows the entire employee's data and information with their photo and digital signatures.

Figure 31: Employee List

8.5.5 Student Details Report

User can see the full details report of any particular student if needed from student list. It is depicted into figure 22.

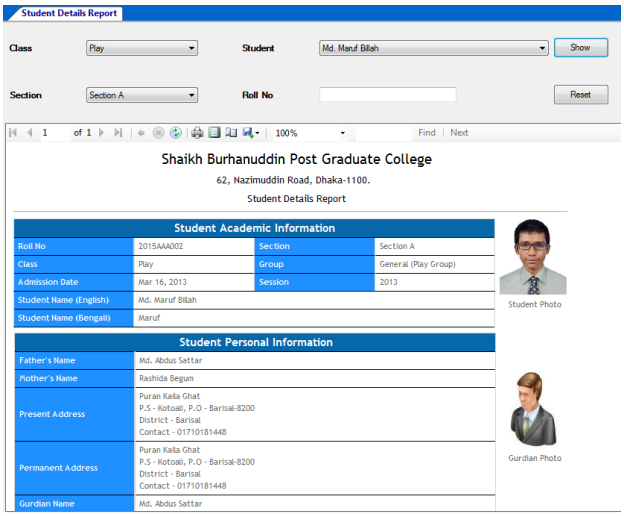


Figure 32: Student Details Report

8.5.6 Employee Details Report

User can watch a particular employ's details report here like their Educational Information, Professional Information, Skill and training Info's.

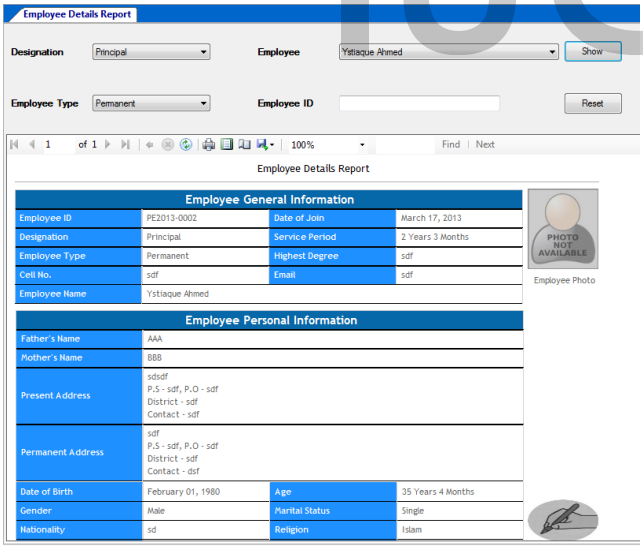


Figure 33: Employee List

8.5.7 Employee List Report

Admin/ User can view employee list report from Employee List. It can be filtered by Designation, Marital Status or Blood group.

8.6 Result

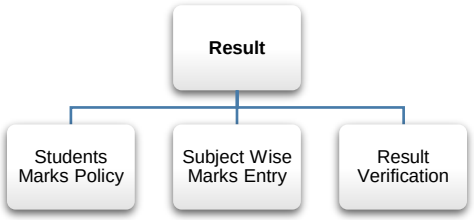


Figure 34: Result Module

8.6.1 Students Marks Policy

Every Educational Institute has its own marks policy. So, they can input their marks policy by this UI. Simply Select class, session and groups then show. Under all subject they can assign marks policy like – have class test or not, class test total marks, pass marks, is marks in hand writing/ spelling, written pass marks, total pass marks etc.

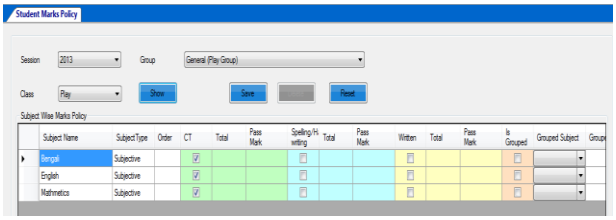


Figure 35: Students Marks Policy

8.6.2 Subject Wise Marks Entry

Subject Wise Marks Entry is marks entry for individual subjects' marks entry. When select particular shift, class, year, group, exam-term and subject then its show all student list in grid view. It's an easy UI for user who entry the marks. He simply input the marks

for particular student and save it. If anybody absent in exam then it should be marks in checkbox. When result is published those student result shows automatically absent in those particular subject.

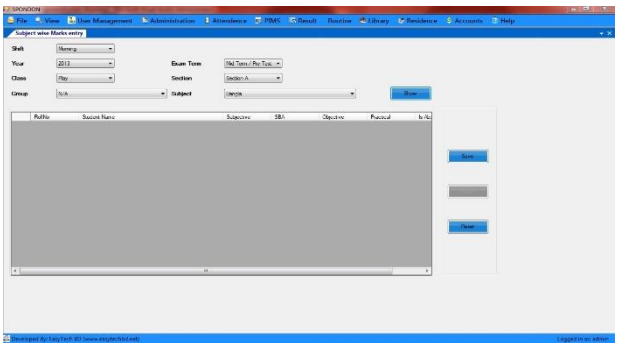


Figure 36: Subject Wise Marks Entry

8.7 Routine

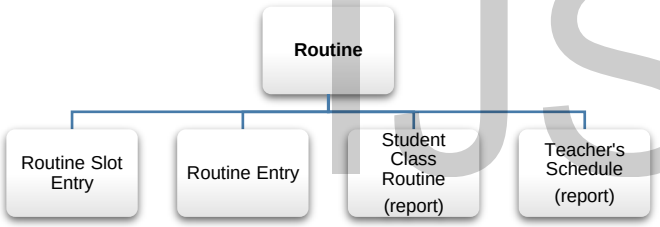


Figure 37: Routine Module

8.7.1 Routine Slot Entry

It's a slot for routine entry. It's just easy to entry the routine. Just select Shift, Year, Day and Time From (7:00 AM) – Time To (7:30 AM) and Slot Title (1st period). Time Slot is individual period time (7:00 AM-7:30 AM). Almost these periods are generated in routine which we entry in Routine Slot Entry UI. Break Time is also assignable by mark the checkbox is break.

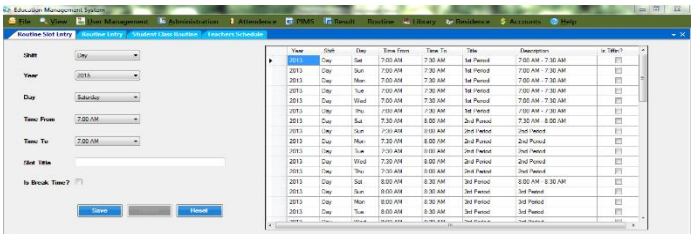


Figure 38: Routine Slot Entry

8.7.2 Routine Entry

Routine Entry view's as day and period wise routine for particular Class, Shift and Year. We just select Subject Name, Subject Type, Teacher's Name and assigns room number for each and every period and individual day. It's a weekly view. When all period's and days are inputted correctly then save the data for next step.

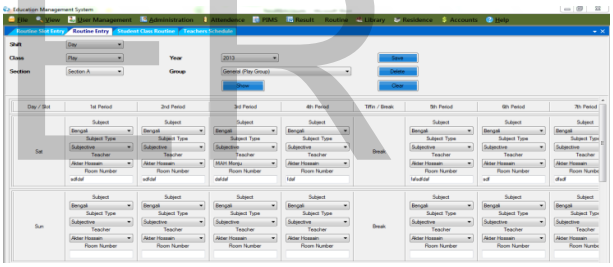


Figure 39: Routine Entry

8.7.3 Student Class Routine

It generated the student Class Routine. Just simply select Shift, Class, Section, Year and Group and then show. We can print this report from here for student use and also export to pdf and excel.

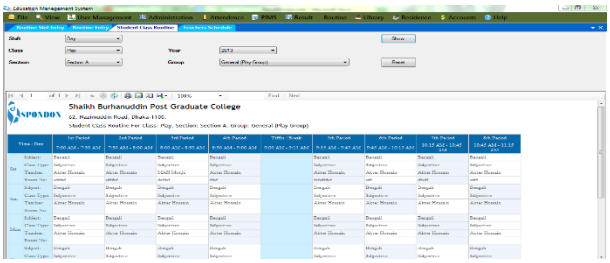


Figure 40: Student Class Routine

8.7.4 Teacher's Schedule

This UI is generated Teacher's Schedule. Just Select Shift, Year and Teacher Name and show the routine. It's a class schedule for individual teachers with date –time and room number. Teacher's can print their schedule for further use and also make pdf or excel file from here.

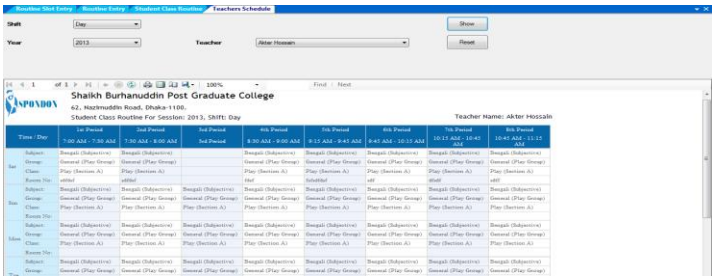


Figure 41: Teacher's Schedule

8.8 Accounts

8.8.1 Debit Head

We can create all expense head as Debit Head. We create debit head as parent head. If we have a child head under parent head then mark is parent head. If this head is linked with class then select linked with class and select class.

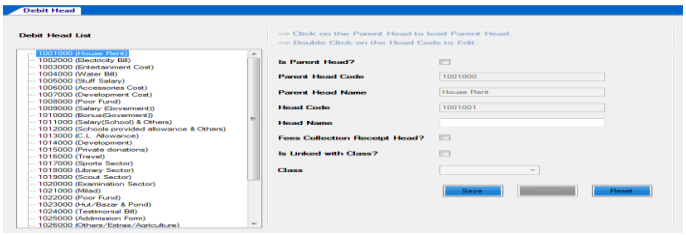


Figure 42: Debit Head

8.8.2 Credit Head

We can create all income head as Credit Head. We create credit head as parent head. If we have a child head under parent head then mark is parent head and under parent head we create child head. If this head is linked with class then select linked with class and select class.

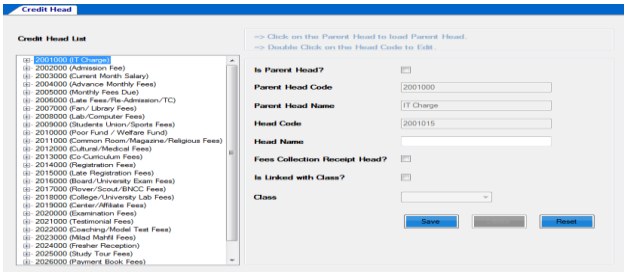


Figure 43: Debit Head

8.9 Accounts

8.9.1 Bank Deposit

When an institute deposits any amount of money into a bank they can input deposit information into this system like bank name, branch name, deposit amount with time and date. Institute can use this information for any further query.

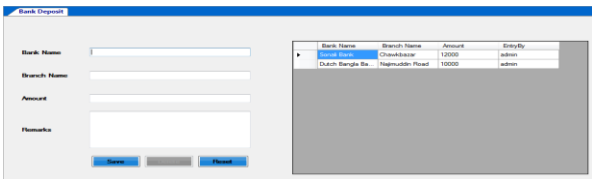


Figure 44: Bank Deposit

8.9.2 Bank Withdraw

When an institute withdraws any amount of money from a bank they can input withdraw information into this system like bank name, branch name, deposit

amount with time and date. Institute can use this information for any further query.

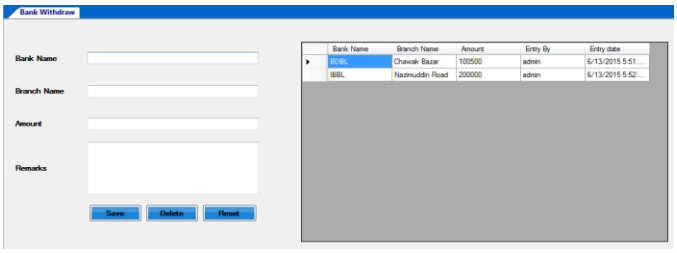


Figure 45: Bank Withdraw

8.9.3 Income

Income UI is most crucial in Accounts module. By income UI we save income source with credit head and amount of income. We simply click into head code and select credit head code for income source. Head name is automatically inputted into head name. Income is need for all accounts report.

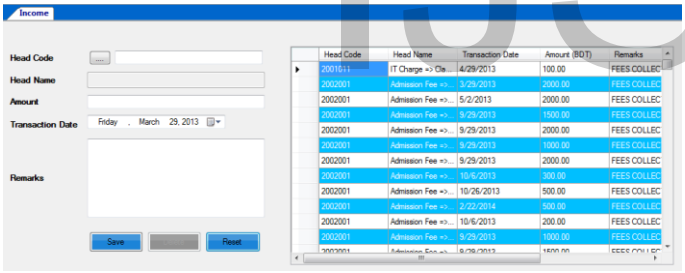


Figure 46: Bank Deposit

8.9.4 Expense

Expense UI is also crucial in Accounts module. By expense UI we save expense source with debit head and amount of income. We simply click into head code and select debit head code for income source. Head name is automatically inputted into head name. Expense is need for all accounts report.

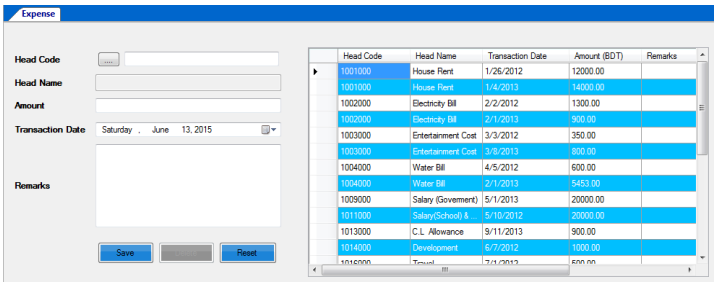


Figure 47: Bank Deposit

9. Conclusion

9.1 Future Work

I have completed software that has included this entire requirement. Solution is piloted in some instituions also.
All good software may have some limitations this software may be some limitations and I am trying to fix it as per possible.
In future I will migrate my db into azure, so that I can mange all my services centrally. Also trying a centralized support system develpmnet with live audio and video calling option.

9.2 Conclusion

The application Education Management Software is the total package for the school or college management system requirements. With the help of menu bar users can interact with software very easily almost every object has been provided with tool bar. The overall solution has coveed personal information, employee management, accounts, attendance, results, routine, reports and many more.
This application is also supporting terminal services so that database will be more secure by centralized the database. In fine I want to say this full package can serve fully for any kind of educational institute and lastly, this solution could be mainstream if arrange some funds.

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