

Assignment 4

Design Patterns

The assignment can be done individually or as a team (consisting of **maximum 2** students). For this activity the team need to design a simple Institute Management System. The description and functional requirements of the system are specified below.

Institute Management System (IMS):

Institute Management System is designed to automate the management process of an institute from student admission to examination management, from course management to schedule management, from human resource employment to salary management.

By using the latest technology, this Institute Management System automates an institute's operations such Student Admission Management, Fee Management, Attendance Management, Examination Management, Human Resource Management, Time Table Management, Salary Management and Records & Profiles Management.

Module of Institute Management System		
Time Table	Messaging	Attendance
Student Admission	Courses and Batches	Examination
Human Resources	User Management	News Management
Student Details	Finance	Multiple Dashboards

Dashboard

- Iconic dashboard
- Innovative 'Search bar' enables any layman user to use the system in seconds of login
- User friendly interface and highly powerful user experience design such that anyone with basic knowledge in computer can start using the system with minimum training
- Easy to learn and easy to master
- Steep learning curve
- Displays latest news on dashboard
- Basic education institute information can be given
- Language settings is available
- Basic configuration like country, currency, time zone, etc can be set
- Other general settings like enabling grading system as per school requirements, automatic unique ID for all the users, etc
- Managing courses and batches
- Batch transfer and graduation facility
- Managing subjects including elective subjects
- Add custom field for admission form

- Activate SMS module
- Set SMS configuration for alerts to be send to specific contact numbers for respective actions
- Send SMS to single or group users or to all
- Manage student categories

Admission

- Unique ID for all students
- Comprehensive admission form
- Multiple guardian addition facility
- Emergency contact facility available
- Previous education details can be recorded
- Customizable as per school standards
- Photo upload facility

Student Details

- Normal student view facility based on batches
- Search existing and former students
- Advanced search facility to search for specific type of students based on large number of filters

Examinations

- Create different types of exams based on grades, marks etc
- Group exams if required
- Extensive Report center
- Generate report for required exams
- Statistical and Graphical view of all reports
- Automated, quick and on demand report generation
- Statistical and chart reports, a better analytical view
- GPA, CCE and CWA Evaluation methods

Manage Users

- Search for any users using the search bar
- View profile of all users based on the roles
- View/Edit users password and privileges
- Set privileges to users as per their roles
- Allows organization to set standards for different roles based on their responsibility

Human Resources

- Manage all employees from admission to exit
- Customizable admission form
- Manage entire payroll efficiently
- Customizable and robust payroll form
- Efficient leave management system available
- Authenticated payslip approval system
- One click payslip approval and reject facilities

- Normal and advanced search facility

Attendance

- Easy marking of attendance
- Note/Remarks for attendance can be given
- Different types of attendance report can be taken
- Reports can be filtered using the available filters

Finance

- Comprehensive Fee classification system
- Separate fee collection date designing system for faster finance process
- Easy analysis of fee defaulters and fee structure available
- Easy fee submission process
- Manage and Pay instant fees
- Manage entire expense and incomes
- Customize and manage different category of expense and incomes
- Different Report generation facility
- Automatic transaction facility are available
- Payslip approval system
- Manage Asset and Liabilities
- Manage Donations
- Assign Tutor to Batches

Messages

- Inbuilt messaging system
- Easy and quick way to send messages to any user in the system
- Effective communication between administration, teachers, students and parents
- Recording communications with students
- Prior information can be informed about school events, news and holidays

TimeTable

- Drag and drop timetable creation design
- Alerts on subject limits per week stats
- Alerts on employee subject limits while creating timetable
- Timetable creation in advance
- Edit/Delete timetable facility available

Manage News

- Create/edit/delete news
- Search for any news using search bar
- View all news facility also available
- Add News using rich text format
- Edit/Delete news
- Published news has the facility to comment also
- Delete comment facility also available

Submission Instructions:

One of the team members will submit a pdf file via the courses portal. There should be a single design document, including at a minimum:

1. Tool name used for modeling design diagrams and a list of all the team members.
2. A UML class diagram showing the main classes and interfaces in your design, along with inheritance (generalization), association, composition relationships, and operations. Include cardinality and role indicators, as you deem appropriate to make the diagram clear.
3. A table summarizing the responsibilities of each major class.
4. Other UML diagrams (e.g., sequence diagrams, state diagrams) that provide insight into the key static and dynamic characteristics of your design. You may choose any one type of diagram
5. A narrative outlining how the design reflects a balance among competing criteria such as low coupling, high cohesion, separation of concerns, information hiding, the Law of Demeter, extensibility, reusability, etc. This should include a discussion of the design patterns used to achieve this balance in the context of expected product evolution.
6. A short reflection on the two strongest and the two weakest aspects of your design.