

## Review Paper on Automatic Schedule Generator and Management System

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**Abstract**— In many colleges still the timetables are generated by manually due to time adjusting management issue. The basic problem of generating timetable is to manage lectures efficient time and resources. So this paper make a practical solution for a solving a dynamic scheduling problem using forward chaining to generate an automatic scheduling timetable by heuristic technique and this method will follow some advance rules, algorithms to fit in the automatic generating timetable modeling criteria's. The intent algorithms will generate the most favorable timetable for these automatic scheduling systems so the lectures will not possible direct interact in order to their time availability among their other functionalities. This system will give satisfactorily results in order to accuracy, adaptability on helping the all faculty and data handling to arrange a presentation of automatic timetable modeling and increase a efficient use of records. The output of this result will be an automatic set of scheduling timetable of lectures in an alternatives that will help all constraint.

**Keywords**-genetic algorithm, heuristic

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### I. INTRODUCTION

Generally in educational sector, a set of subjects and exams are assigned into a certain number of timeslots which becomes tedious to assign those particularly in real-world. There are plenty of commercial software packages available to serve scheduling issue. However, due to the plenty of attributes, strategy and complexity of each department in the scheduling process makes it interesting. We can take the help of certain algorithms to solve the problem of scheduling in order to reduce the human efforts and time. Both the faculty and students challenges have to face in scheduling and assigning the proper lectures. In this paper the research techniques for this proposed system with the analysis of the problem and with the literature survey for algorithms of the proposed system. Also focuses on the architecture of the proposed system, the detailed description of the design and implementation of the proposed system. Finally, the overall conclusion of this research on how the system will help the department and student to arrange schedules properly and with the optimization and appropriate use of provided resources.

The courses have to be finished within limited period of time each semester and the number of applying students and

sometimes faculty can also varied due to certain circumstances. Again even their can be the situation that two classes are appointed in a single class or lab so their can be the overlapping. Lecturers can be the members of the committee or some event can have issues with their time availability. Due to the double-assignments of schedule or due to the already isolation of rooms lectures are dropped or rescheduled. There can be the case when the due to miscommunication or wrong message the schedules or slots allotted remains unused. Even if several institutes administrative work is computerized, the lecture timetable scheduling is still mostly done manually due to its unspecific variations. The manual work demands considerable time and efforts.

An Automated Scheduling will be designed and implement to overcome those constraint and conflicts that have been recognized and highlighted above, also to reduce challenges while handling dynamic resource allocation. This paper describes the use of forward chaining method of the expert systems methodology to search the most appropriate timeslot automatically. The rules consists of the basic logic design of the system with all the constraints applied over it.

The Automated Scheduling System will help the department to produce the timetable schedule automatically by considering below cases:

- Timing of each Session and practical slots, which differs each semester;
- Staff's availability as the staff must be free to take the lecture;
- Rooms or the labs availability as per the schedule with no overlappings.

## II. LITREATURE REVIEW

Several unconvensions in University timetabling, Sports Timetabling, Examination Timetabling etc can be occurred. In the year 1975, John Holland proposed Genetic Algorithms (GA) and has described this idea in his book "Adaptation in natural and artificial systems". Carter and Laporte (1998) considered various ways to solve the scheduling problem those are, Cluster method, Sequential method, Meta-Heuristics and Constraint Based method. Meta Heuristics is a higher level procedure that is used to provide better solutions for optimization problems. But some class of problems do not guarantee a globally optimum solution. This is achieved at the cost of optimality and precision for speed. In this paper we consider the following Meta-Heuristic methods.

Genetic Algorithms comes under the class of Evolutionary algorithms to derive a set of solutions towards the optimal solution which uses the principle of natural selection inspired by Darwin's evolutionary theory. It is a search heuristic that produces solutions to optimization problems using techniques inspired by natural evolution like mutation, inheritance, crossover and selection. Here the algorithm is normally started with a set of candidate solutions called the population. Each solution in the initial population has a set of attributes (its chromosomes or genotypes) that can be altered and mutated. Solutions from one population are taken and used to make another population, for demanding new population will be better than the old one. Solutions are chosen for breeding on the basis of their fitness. The fitness function generally identifies the number of constraints violated by a timetable. A timetable is said to be more fit if it violates less number of constraints. In the timetable generation problem, the population is a set of timetables maintained in memory. Each timetable is calculated by finding the number of times it violates the constraints. Each timetable has an equal chance to take part in breeding. Bhaduri A evolutionary technique have been taken in use to solve the timetable scheduling problem. Methodologies like Genetic Algorithms (GAs), Evolutionary Algorithms (EAs) etc have been used with mixed success. In this paper, the problem of educational time table scheduling and solving it with genetic algorithm is involved and issued. We have to further solved the problem with a mimetic hybrid algorithm, genetic artificial immune network (GAIN) and compare the result with that obtained from Genetic Algorithms. Results show that GAIN is able to reach the optimal feasible solution faster than Genetic Algorithms

For identifying a feasible lecture or course timetable in a large university department is an issue faced continuously in educational institutions. An evolutionary algorithm (EA) based approach to solving a heavily constrained university timetabling problem is presented in this paper. The approach

uses a problem-specific chromosome representation. Heuristics and context-based reasoning have been used for obtaining feasible timetables in a less computing time. An intelligent adaptive mutation scheme has been employed for speeding up the convergence. The comprehensive course timetabling system presented in this paper has been validated, tested and discussed using real world data from a large university.

## III. OBOJECTIVE

Objective of automatic generation of timetable is to study and analyse the various algorithms of schedules to obtain automatically generated timetables, It will reduce a time required for generating timetable than existing system. Automatic generation of timetables can increase professionalism and precision of proposed system and help to the group of college departments staff to follow their schedule decently. Automatic generation timetables will reduce paper and exert.

## IV. SCOPE

At the Last system will generate a timetable in totally automated way, which will save a most of time and efforts of admin department. It will yield a special feature of service for everyone to view the table. This System will able to provide an adequate preparation with an indispensable individual details fact of group of college departments. Subjects which are store in database. It can also focus on an optimal of staffs and classrooms.

## V. EXIXTING AND PRAPOSED SYSTEM

Normally timetable schedule is produced manually. Creating and maintaining the timetable will not be difficult for every Institutions or college. Timetable generation will become more difficult in such case as well as time consuming too. As mentioned above, when Timetable is produced, it must consider the maximum and minimum workload that is being occurred in college. A comprehensive timetable management solution is proposed for Colleges which helps to overcome the challenges in current system. Automatic Timetable manger is a Java based software which helps you to manage all the periods automatically. Proposed system will help to generate it automatically also helps to save time and manual work. There is no need to worry about lecture details and maximum workload of the faculty to them.

The proposed system will produce timetables for each lecturer to attend the given timeslots. Administrator must be needed who will manage the schedule scheduling properly for any required changes at an instance of time. With the proposed system, also the services logic that controls the concepts of managing the complexity to produce and schedule automatically is developed. This automated scheduling system will be using a web based application as a platform for the proposed system.

## VI. SYSTEM OVERVIEW

The block diagram of the proposed system shows the inputs provided to the system and the outputs which will be then used to assign constraint and get an optimal timetable as solution. Figure 1 shows system overview which contains all details regarding system working. In system three users are there in which HOD can work as an admin which can monitor all

communication between staff and student as well as all data on website.

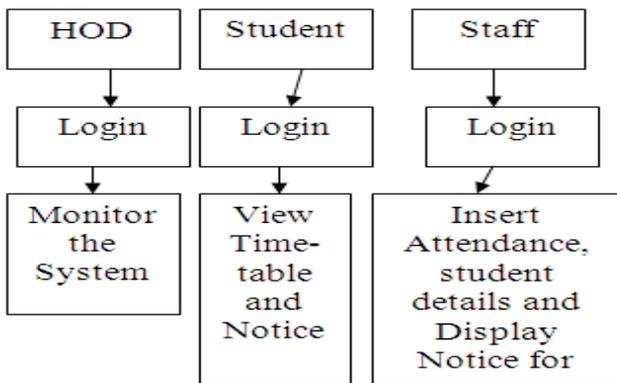


Fig 1: System Overview Diagram

A. *Mathematical Model parameter*

There are individualizing constraints to be satisfied at the time to instantiate movables about time slots and classrooms. The constraints can be hierarchical into strong and weak constraints as follows:

- *Strong Constraints*
  1. A classroom is not assigned too many lectures at the same time.
  2. A teacher cannot teach more than one class at the same time.
  3. Courses for the same year-meeting students of a department cannot take place at a time.
  4. The classroom for course should have sufficient capability to take students registered in the course.
  5. The classroom should be well equipped with optional facilities for the classes.
- *Weak Constraints*
  1. The lectures are not assigned to slots which are in the instructor’s taboo time zones.
  2. Teachers daily lecture hours should be limited to be within the allowed maximum hours.
  3. Classes are scheduled in the teachers preferred time zones.
  4. A lunch break must be scheduled.
  5. If possible, the lecture hours for a course should be scheduled continuously.
  6. As far as possible, classes should be scheduled in their corresponding department’s reliable sources-use classrooms.
  7. The classrooms should be Assigning in a same manner to minimize the distances between adjacent classes’ classrooms.

It is coveted for timetables to satisfy all strong and weak constraints. However, it is usually not simply to meet all these constraints. The virile constraints must be satisfied all the times, but impotent constraints can be somewhat sacrificed to find practice timetables.

In order to deal with the timetabling issue, we are putting forward a system which would mechanically generate timetable for the different courses of the institute. Courses and lectures will be scheduled in accordance with all the possible constraints and the given inputs and thus, a timetable will be generated. The system will allow interaction between the staff and students and at the same time enable them to upload their

queries, notes, presentations and e-books. The necessary changes and the additional constraints for the next week timetable will also be considered by this timetable generation system. The Figure 2 of flow chart shows overall working of Automatic Time Table Generator System.

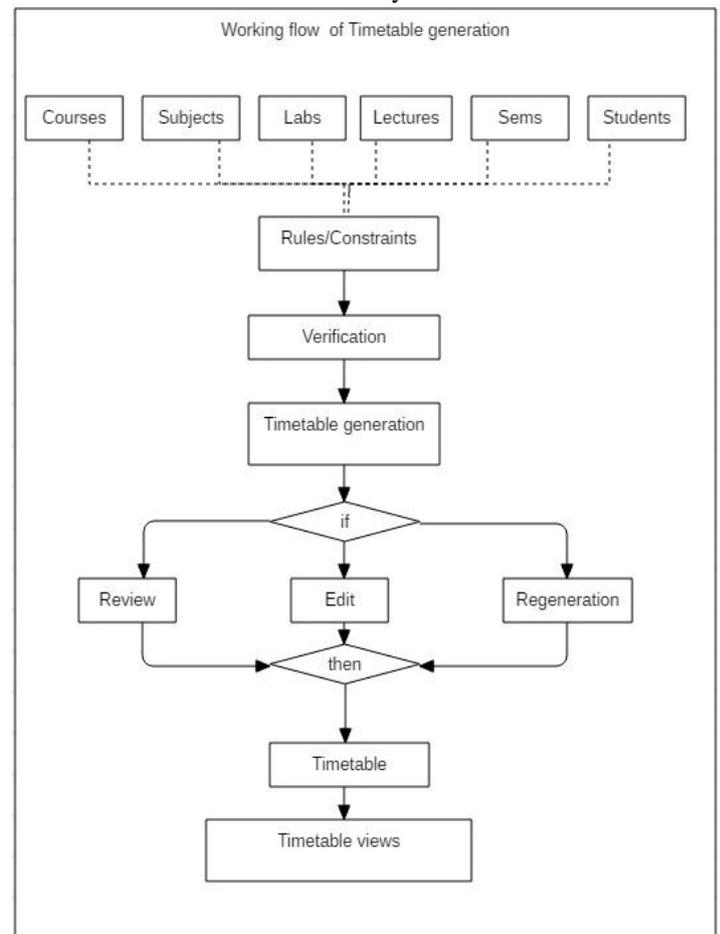


Fig 2: Working Flow of Automatic Time Table Generator System.

B. *Design Approach*

Figures:

• **ER Diagram:**

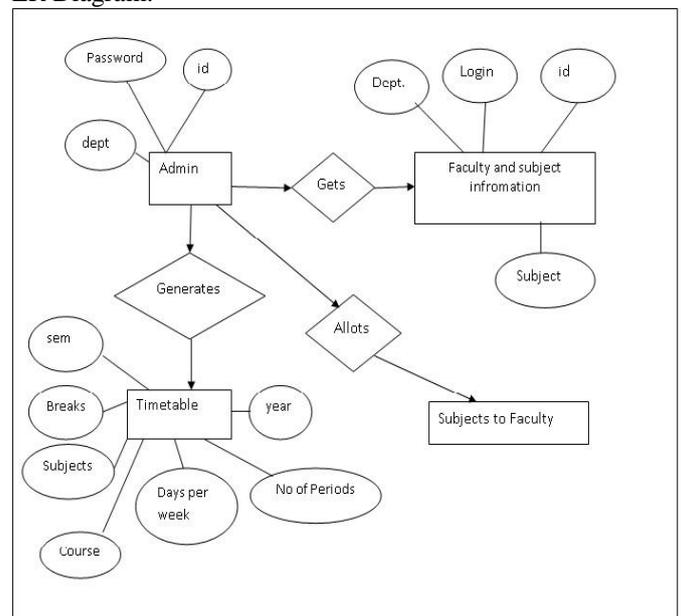


Fig3 :- ER Diagram for Automatic schedule generator and management System.

- Use case Diagram:

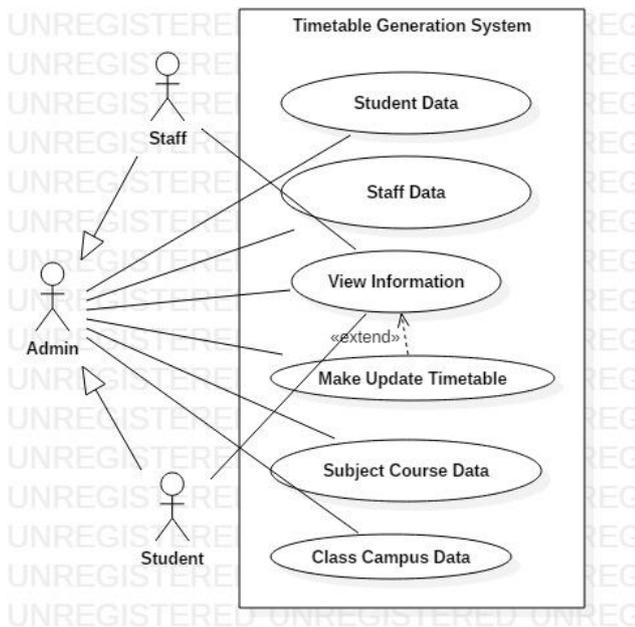


Fig: 4 Use case Diagram For Automatic Schedule Generator and Management System.

### C. Modules

#### 1. Admin module:

In admin module the admin plays a major role in this system and can allocate the subjects for staff. Admin is the super user for this system and can manage the application. So, the admin can view all the details and he can update and delete the information. The admin can view the admin and the user register details and mainly can generate the timetable. HOD will accept or reject the leave request. Admin can view the attendance details of staff. They can edit, view and update the leave records of staff. Admin will maintain the entire database.

#### 2. Staff module:

The staff should register in the registration page before entering to the timetable view. Once the staff login into the page then can view the timetable, can check for which semester and subject they are been allocated. The staff module is based on the admins allocation where the staff can view their specific timetable and the department timetable.

#### 3. Student Module :

The Student should register to the system then login into the page so that then student can view timetable at any place and anywhere.

### D. Algorithm Strategy

Algorithmic strategy contains heuristic algorithm, variable used for that and different assumption for satisfying goals:

- Heuristic Algorithm:

The term heuristic is used for algorithms which find out solutions among all possible ones, but they do not confirm that the best will be found, they may be thought as about and not accurate algorithms. These algorithms, usually find a solution close to the best and they find it fast and simply. Sometimes

these algorithms can be accurate, that is they defector find the best solution, but the algorithm is motionless called heuristic until this best solution is proven to be the best. The method old from a heuristic algorithm is one of the known methods, such as greediness, but in order to be simple and fast the algorithm ignores or uneven suppresses some of the problem's demands.

### VII. ADVANTAGES

1. Saves Time and Effort
2. Reduces Error.
3. Instant Notifications for changes.
4. Substitute management.
5. Smooth integration into the school calendar.

### VIII. CONCLUSION

Our approach of developing automated timetable system is successful in generating timetable and manage it so that it will not overlap the schedule of staffs and students lectures. It is our sincere attempt to manage all workload of staff members, student's Shift and also classes and labs. This application is provided with necessary details of faculty and subjects which are stored in database and then by making use of the available data it generates the lecture-course timetable with minimum time when compared to manual generation of timetable which is more feasible than existing one. The major benefit of this project is to store information at one place and it can be accessed via online transaction. Instead of tedious paper work, students can view the timetable with a quick turnaround. This system is user friendly and provides faster and better generation of timetable, which in turns saves time.

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