CLASSROOM SCHEDULING SERVICES – A REVIEW

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Abstract:

The main aim of this project is to create an Android app that will allow staff and students to easily access the classroom schedule. Additionally, administration may simply assign time based on worker availability. SmartClass is able to offer classroom scheduling services with backstage design space exploration and greedy algorithms because to the introduction of service-oriented architecture (SOA). Additionally, in order to meet certain requirements, the SmartClass design may be flexibly linked with other scheduling algorithms (such as Greedy, DSE, etc.). A example case study highlights how SmartClass offers a fresh approach to the age-old issue of class scheduling. By reusing software services, it may achieve great flexibility and reduce the workload of educational programmers. Evaluation findings on productivity, costs, and scheduling performance show that the SmartClass has lower scheduling costs and improved productivity. The amount of paperwork required to assign the schedule has decreased. We suggest a method that prohibits teachers from instructing two classes at once; Two lectures cannot be followed at once by a student; A Some educators are required to take at least one day off each week; The schedule should include all of the days of the week; Subject X must work precisely so many hours every week; The seat count and multimedia requirements have to be satisfied. It also includes staff feature changes and the permission of leave.

Introduction:

THE PROBLEM OF CLASSROOM SCHEDULEING has been identified as one of the most significant issues for educational programmers and teaching secretaries. In most circumstances, this is correct.

Still a manual procedure, especially in underdeveloped nations with a huge number of students and lecturers. CAD approach has been used to focus and broadly conduct the problem during the last few decades. However, because classroom scheduling has long been proven to be an NP-Complete issue [1,] the focus of recent research is turning toward more practical rather than ideal technically sound methods.

Unfortunately, the increasing complexity of the input parameters is making it difficult to address the classroom scheduling problem. Several key restricted aspects, such as timing, teacher, lecture, classroom, and students, must be included in the modelling. In the meanwhile, there are other limits such as multimedia needs and seat constraints. Making a sensible and efficient classroom scheduling plan involves a significant amount of time and work.

Learning from contemporary cutting-edge fields, the classroom scheduling problem is facing the following major challenges:

1) For starters, the classroom is only linked to one class at a time. That is, each class might be assigned to only one room, but it is also preferred to assign all lectures from the same class to the same classroom. This prospective necessity has complicated the classroom scheduling strategy.

2) Second, if a dispute arises, such as a lack of accessible resources,
   If there are no more classrooms or open time slots, the scheduling
   system must revert to earlier solutions. It has a significant impact on
   the partially completed scheduling plan and may result in new conflicts.

3) Last but not least, other restrictions such as seat quantity and
   multimedia needs must be taken into account in the scheduling techniques.

Literature Survey:

In an effort to automate some human tasks, numerous studies have been published in the literature. For instance

[1] Zawacki-Richter et al – He analyzed the literature on various aspects of distance learning and suggested paying more attention to the intercultural aspects of students. He described learning analytical strategies. The term "learning analysis" refers to the study of student activity aimed at measuring academic success and predicting future performance. Online networking interactions, tests, homework assignments, discussion forum updates, and other activities are examples of student behavior. In recent years, there has been one increased use of Augmented Reality (AR) in education, especially in secondary schools. He has published research on implementing AR in smart classrooms. The introduction of smart classrooms has created a new educational model. The three most common models are e-learning, blended learning, and flipped classroom. According to the author, multimedia technology is pervasive in business schools, enhancing student and teacher learning performance

[2]John Benedict C. Legaspi, Roman M. De Angel, Ace C. Lagman, John Heland Jasper C. Ortega :
For collaboratively creating class schedules at the CCS Department of the FEU institute of Technology, a web-based scheduling system has been conceived and created. With the use of a web application that will automate the process of mapping courses, this will assist directors and coordinators in managing the construction of course schedules. The advocates offered manual creation as a scheduling choice. This study excludes alternative algorithms in favour of concentrating solely on the Greedy algorithm's application to the scheduling management module.

[3] CHAO WANG ET AL - A descriptive summary of the classroom scheduling service for smart classrooms is provided in the study that is related to this publication. Many formulations and algorithms are used, it was proposed to solve the problem of traditional classroom planning. Since the authors use MATLAB for simulation, computational complexity can have a dramatic impact on performance. Recently, an integer linear programming (ILP) approach has been proposed to solve the scheduling problem. ILP models are developed and solved using three advanced ILP solvers based on generic algorithms and SAT (Boolean Satisfiability) techniques. The Smart Class architecture provides a set of backstage control web pages that allow administrators to interact with database management. The lesson planning process can be driven by a planning algorithm or manually by an administrator.

[4] Cut Fiarni,Arief Samuel Gunawan,Ricky,Herastia Maharani,Heri kuniawan : In order to handle the collaborative function of this system, Project and Thesis Presentation Automatic Scheduling System is a web-based system. As a result, it can be accessed anywhere and whenever it is needed, either through a variety of devices that have a web browser (such as mobile phones, tablets, laptops, computers (PCs), and so on).According to tests of alternative schedules run on the system (either manually or automatically), the system's schedule matches expert users' schedules 100% of the time. It also offers higher adaptability and better data handling than the previous system for scheduling theses and projects. As long as it has the same characteristics, complexity, rules, and limitations as the proposed system, the concept can be used to various types of dynamic resource allocation, automatic scheduling systems.

[5] Pavel Younus Abduallh, Dr.Bzar khidr Hussan: This project aims to enhance the Scheduling Class System and simplify the explanation of database accessibility. Using the web, this database was implemented. PHP is an application programming language, and MySQL is a database management system. This project was developed to give administrators and instructors a framework within which to nominate coursework, including teacher course timetable, classroom, and day's tables ,as well as to provide feedback on each coursework. In case of changes, it enables the end-user to add, edit, delete, save, and update records or information. Reports such as class schedules, class lists, teacher lists, hall lists, department lists, and school years with multiple semesters can be generated using it .The best feature of this system is that it may be expanded upon in the future because to its flexibility and scalability, both of which are crucial. The Class Schedule System will require additional development and linkages. A smartphone application's development and execution are still unresolved issues.

[6] Freddie Rick E.Labuanam , Sheena-Jeans E.Tapaoan, Richards Q.Camungao : The Application of Representation and Fitness Methods of Genetic Algorithm in Class Scheduling (ARFMGACS) developed by the college of CCSICT was given in this study. Class scheduling is made more organised by using the representation technique; it functioned as a holding area for automatically generated schedules, and the fitness method is the formula used to layout the newly constructed course class into a schedule. The system offers functionality for creating pre-scheduling templates using the genetic algorithm's representation approach and for creating class, faculty, room, and lab schedules.

1. Include the specific class schedules based on the
Enrolled in a course.
2. Enhance and rework the Fitness Function Method for the Generation of Unusual Student Schedules and Campus Extension Schedules.
3.Drag and drop scheduling for features that involve manual scheduling.
4.Consider adding the additional data elements from the Generation of Faculty Workload.
5.Include the other ISO 9126 Standard indications.

[7] AVNEET KAUR – This study provides a detailed summary Interdisciplinary research and proposals for new research directions. To position our paper, we first discuss the available reviews and then introduce our contributions. A lot of research is being done in different areas of smart classrooms. As already mentioned, these works cover a wide range of fields and topics. The possible ideas are therefore inherently complex. Our research uncovers learning deficiencies in smart classrooms and introduces readers to comprehensive smart classroom solutions. Most of these studies recognizing and impacting the impact of technology on teaching and learning technical side. These studies generally define intelligent classrooms from a single angle based on the aspects studies and often do not provide a balanced view of intelligent classrooms service and technology. In addition, a detailed review of educational tools and techniques from a teaching and learning perspective is also considered

Author	Title	Year	Methods
Zawaki-Richer et al	A Survey Of Smart classroom Literature	2009	Learning analytics , Datamining
John Benedict C.Legasi, Roman M.De Angel, Ace C. Lagman, John Heland Jasper C.Ortega	Web based Course Scheduling System Using Greedy Algorithm	2012	Greedy algorithm
Chao Wang, Aili Wang, Xi Li, Xuehai Zhou	A Classroom Services For Smart Class	2015	Genetic algorithm, java
Cut Fiarni, Arief Samuel Gunawan , Ricky, Herastia Maharani, Heri kurniawan	Automated Scheduling System For Thesis And Project Presentation Using Forward Chaining Method with Dynamic Allocation Resources.	2015	Forward chaining with Dynamic Allocation Resources.
Pavel Younus Abdullah, Dr Bzarkhidar Hussan	Class Schedule system	2019	Database, MYSQL, PHP, Apache
Freddie Rick E, Labuanam, Sheena-Jean E, Tapanam, Richardo Q, Camungaoo	Application of Representation and fitness Method of Genetic Algorithm for Class Scheduling System	2021	Genetic algorithm, java
Avneet kaur ,Munish Bhatia, Giovanni Stea	A Survey Of Smart Classroom Literature	2022	Learning analytics, Data mining

Conclusion:

This essay suggests Smart Class, a traditional classroom scheduling strategy that incorporates a services-oriented notion. The services are offered to the terminal users and each sort of resource is abstracted as one. The Smart Class architecture incorporates greedy based scheduling to compute the outcomes. According to experimental findings from case studies, Smart Class may effectively increase scalability and adaptability. Because the Smart Class design handles the scheduling at the server level, it might greatly reduce the workload for educational programmers. The project is still under progress since there are many worthwhile paths to explore despite the good early results. Among the topics to be covered in future work are to achieve high throughput and service integration, we will first expand the server to distribute cloud-based systems. Second, in order to obtain results, we also want to incorporate timing interval design-space exploration into the scheduling scheme. Not to mention, different scheduling strategies like the ILP and graph theoretical ones might take the place of the greedy strategy used in this study.

Acknowledgment:

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[3] **Choa Wang, Member , IEEE, Aili Wang , Xi Li , Member , IEEE, Xuehai Zhou Member , IEEE-**"A Classroom Scheduling Services For Smart Classes", January 2015
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10.13140/RG.2.2.13580.87680

[6] **Freddie Rick E.Labuanam, Sheena-Jean E.Tapaoan, Richards Q. Camungao -**
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[7] **Avneet Kaur , Munish Bhaita , Giovanni Stea –** " A survey Of Smart Classroom Literature " ,2022 .