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Xallot: A Scheduler for Allotment of External Examiner for Practical Examination

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***Abstract:** In today's era, most of the manual works are replacing by the machines and different applications. Due to this, human efforts are drastically decrease with highly increase in efficiency. The making of such applications or software reduce time and provide high accuracy. Although, there are some jobs or works those performs manually. Similar problem is faced by Sant Gadge Baba Amravati University. The current problem face by Sant Gadge Baba Amravati University is the allotment of professor for external practical examination taken in all the colleges under Amravati University. Usually in university the meeting is conducted for allotment of the externals under the university, but there is possibility of occurrence of chaos. This process is too much complicated and time consuming. Also, there is some possibility of partiality in allotment. To solve this problem, there should be an application or software which can schedule allotments of the externals. This software generate output depends on the parameter such as qualification, experience, subjects taught, etc. and provide output direct in the form of table contents.*

***Keywords:** Xallot; Genetic Algorithm; External Examiner; Scheduler; Practical Examination; Banker's Algorithm.*

I. INTRODUCTION

During the season of exams at the time of university practical examination university allots different professors as an external to the different colleges lying under the same university. For these allotments each college within same university certain number of professors are appointed to act as an external in the practical examination. But, before allotment of the professors for practical examination there is a meeting of all the professors who are selected to act as an external by different colleges. When this meeting is arranged in university, in this meeting there is too much chaos in the meeting. Each professor wants to go to different college for a particular time, but this is not possible as number of requirement for the professors for different subject is different for different colleges. Also, the requirement is depending upon the number of branches & the number of students in the particular branch, again their timing is also having to be managed. So, the result of the meeting taken in the university has no conclusion. In this meeting there is only disorder and confusion. Due to this reason university randomly allot the different professors according to requirement of the subject & the number of students performing practical exams. The process took very long time for the allotment of the professors for different colleges. University has to be managed the timing of the practical examination. To simplify the task, develop software that schedules the professors according to their requirement of college. The Xallot application will be developed for the Sant Gadge Baba Amravati University to schedule the allotment of the professors as external for university practical exams in all B.E. colleges in Amravati University. This system automatically allots the professor as external according to their years of experience & qualification to the respective field in various colleges without human interference and generate the allotment result.

II. WORKING

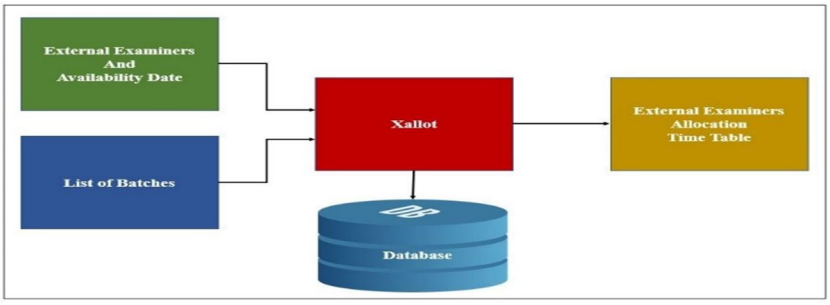


Fig. 1 Block Diagram of Xallot

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The word Xallot is the combination of the two words External and Allotment, which means the allotment of the external examiner. Xallot is the name of software developing for the allotment of the external examiner for practical exam during the university examination. This software work by taking some inputs, store them in the database, process this inputted data by applying algorithms and provide suitable list of the allocated external examiners for practical exams as an output.

Xallot system will take three parameters as inputs which are list of External Examiners, list of Availability dates of the external examiner and list of Batches in all the colleges. These inputs will be provided by the colleges belongs to the particular faculty in the University to the University administrator. The University administrator will provide the inputs to the Xallot. These inputs are stored in database for processing. Using Genetic Algorithm and Banker's Algorithm, operations will be performed in Xallot system. The allocation list will be generated by the Xallot as output. This list will be stored in the database as the External examiner allocation Time Table.

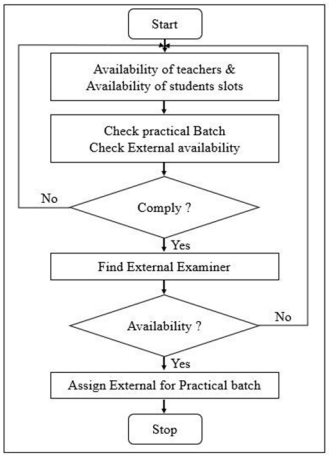


Fig. 2 Flowchart of Xallot

To allocate the external to the available student slot first we have to check the availability of teachers as well as availability of student slots then we have to check practical. If all the conditions are satisfied then Xallot will find the number of available external examiner, if not then it again checks the availability of external as well as practical batch.

III.ALGORITHM USED

A. *Bankers Algorithm For Resource Allocation Safe Sequence*

The main advantage of Bankers algorithm is use to check safe sequence. In Xallot Bankers algorithm is used for checking safe allotment of External examiners. So that same examiner cannot be allotted to more than one practical batch at a time.

Let Ri be the request vector for process Pi. If Ri[j] == k, then process Pi wants k instances of resource type Rj. When a request for resources is made by process Pi, the following actions are taken:

1) Step 1. If Ri <= Ni, go to step 2. Otherwise, raise an error condition, since the process has exceeded its maximum claim.

2) Step 2. If Ri <= Avail, go to step 3. Otherwise, Pi must wait, since the resources are not Avail.

3) Step 3. Have the system pretend to have allocated the requested resources to process Pi by modifyil1.g the state as follows:

Avail= Avail- Ri;

Alli =Alli +Ri;

Ni =Ni- Ri;

If the resulting resource-allocation state is safe, the transaction is completed, and process Pi is allocated its resources. However, if the new state is unsafe, then Pi must wait for Ri, and the old resource-allocation state is restored.

Where, Ri=Request, Avail=Available, Ni=Need, Alli=Allocation. [1]

B. *Genetic Algorithm for Scheduling Problem*

A genetic algorithm is a heuristic search technique used in artificial intelligence and computing. It is used for finding optimized solutions to search difficulties based on the theory of natural selection and evolutionary biology. They are considered capable of finding practical solutions to complex issues as they are highly capable of solving unconstrained and constrained optimization issues. Genetic Algorithms (GAs) are basically the natural selection process invented by Charles Darwin where it takes input and computes an output where multiple solutions might be taken. A Genetic Algorithm provides the systematic random search. [2]

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Algorithm

Step 1. Initialization population.
Step 2. Selection according to fitness.
Step 3. Crossover between selected chromosomes.
Step 4. Perform Mutation.
Step 5. Repeat cycle till the condition of stop is true.

1) Selection: We are studying the previous manual system and selecting previous allotment time tables.
2) Crossover: The algorithm takes two random chosen individuals from parents and merge them to get two different individuals (as child).
3) Mutation: Algorithm will combine various outputs obtained from crossover to eliminate redundancy.

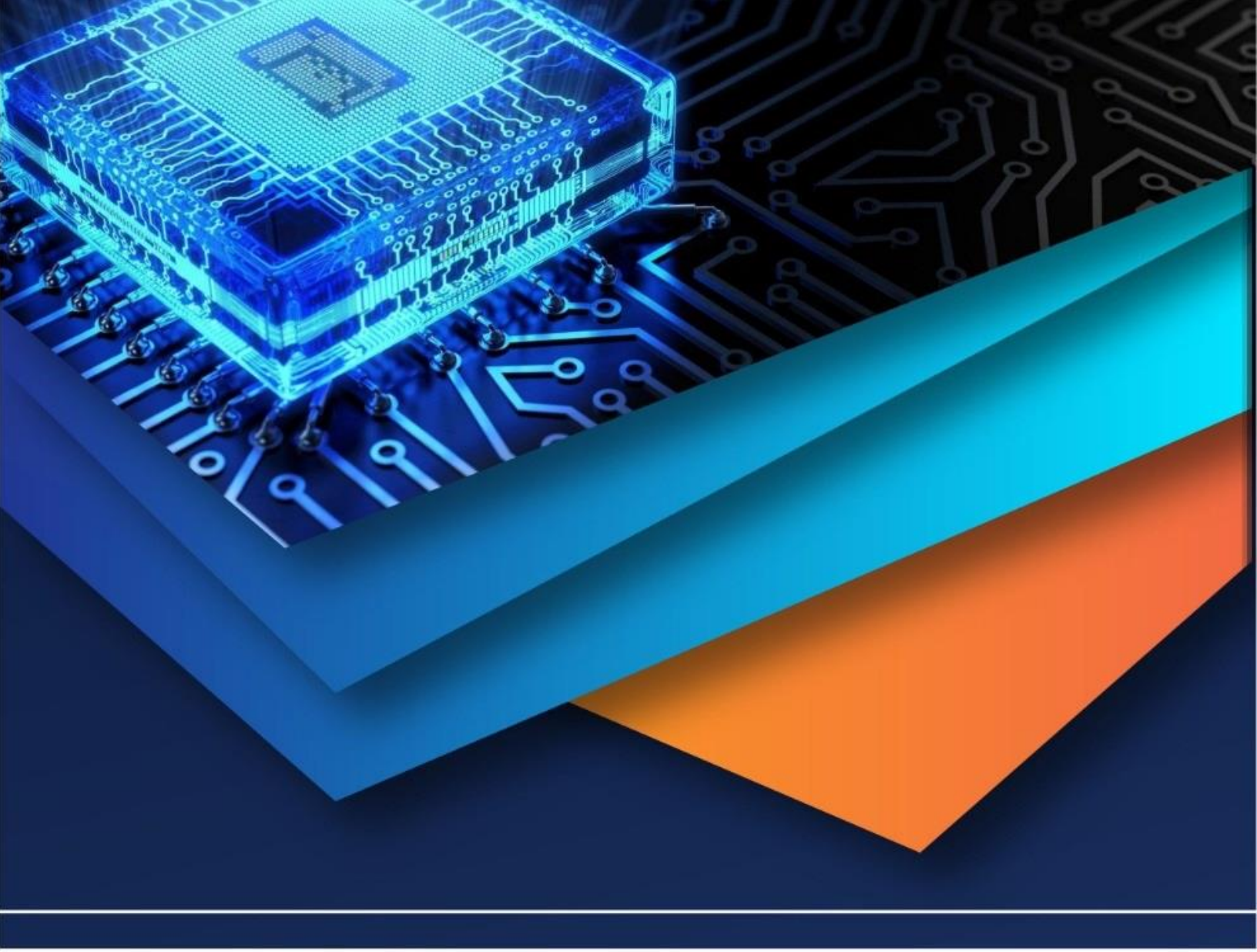
IV. CONCLUSIONS

The Xallot application will be developed to schedule the allotment of the professors as external for university practical. This system automatically allots the professor as external according to their years of experience & qualification to the respective field in various colleges using Artificial Intelligence and generate the allotment result. This will minimize the work load of the university as well as chaos at the meetings. Xallot can be created by using the Genetic algorithm and Banker's Algorithm. Banker's algorithm is used for checking safe sequence, whereas Genetic algorithm uses Artificial Intelligence for the allotments.

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