Employee Work Schedule Presence System Application Design at PT. Tasya Putry Mandiri Uses Genetic Algorithm Method

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Abstract: Employee scheduling planning is a problem faced by many companies that have many employees. The traditional scheduling process is carried out by recording employee data one by one and collecting them in the form of an Excel report which is inefficient and takes a lot of time. Apart from that, to match the schedules, management needs to take great pains to arrange shift times so that they match and do not conflict between one shift schedule and another shift schedule. This method is very inefficient because it takes a long time if it turns out there is an error in the schedule. A popular method for making schedules is to use a genetic algorithm which is able to arrange schedules using a random approach to find schedule solutions that are most effective and do not collide with each other. Research was conducted to create a schedule from a list of existing employees. As a result, the schedule produced using a genetic algorithm was proven to be more optimal and faster.

Keywords: Scheduling, Genetic Algorithms, PT. Tasya Putri Mandiri, Attendance System.

INTRODUCTION

Technological developments in the world today are very fast and rapid, especially in the field of information and communication technology. The rapid development of technology encourages everyone to create various kinds of tools or applications to help support productivity in the work environment. This development has given birth to many new things with various innovation models, one of which is an employee attendance system.

The most basic thing about a job is an attendance register or what is usually called absenteeism where attendance will be used as a reference for assessing an employee's work. Even though PT Tasya Putri Mandiri already uses advanced technology in managing its company, this company does not yet have a system to record employee attendance. All employees still use manual attendance, namely by reporting attendance to their respective team leaders, after that the team leader sends a recap of each employee's attendance to the HRD team in the form of an excel file. Managing employee attendance data is difficult, especially when compiling data on employees, which is quite large in number. Employee data taken manually requires data collection which takes a long time and is inefficient. Seeing these conditions, the author tries to create a solution to make it easier to collect employee attendance data in tracking employee attendance and absenteeism. The application that will be designed will help to record employees and make it easier for HRD to manage schedule data for PT employee shifts, which number more than 30 shift employees.

Therefore, in this research activity the author took research to create an employee attendance and work scheduling application at PT. Tasya Putry Mandiri uses a Genetic Algorithm to make it easier for companies to manage their employee attendance data.

METHOD

The definition of an algorithm is a clear series of instructions for solving a problem, namely to obtain the desired output from an input. The Genetic Algorithm is a heuristic method developed based on the principles of genetics and the natural selection process of Darwin's theory of evolution. The optimization method was developed by John Holland around the 1960s and popularized by one of his students, David Goldberg in the 1980s. The principle of a genetic algorithm is to find the best solution based on a fitness function that has been defined by the developer.

The performance of a genetic algorithm works in the form of a code set of parameters. To solve more complicated problems, integrated genetic algorithms use hybridization methods to increase the effectiveness of their performance. The search is carried out with the population of the scheduling problem represented as a string of chromosomes and interacting in sub-components. Several studies have used genetic algorithms in solving scheduling problems including: algorithms for developing work shift scheduling, part-time work, student scheduling, security scheduling, genetic algorithms find optimal solutions to work shift scheduling problems.

RESULT AND DISCUSSION

Following are some of the processes for finding solutions in this algorithm that take place in the same way as choosing a solution in this algorithm takes place in the same way as choosing an individual to survive in the evolutionary process.

Picture 1
Genetic Algorithm Process
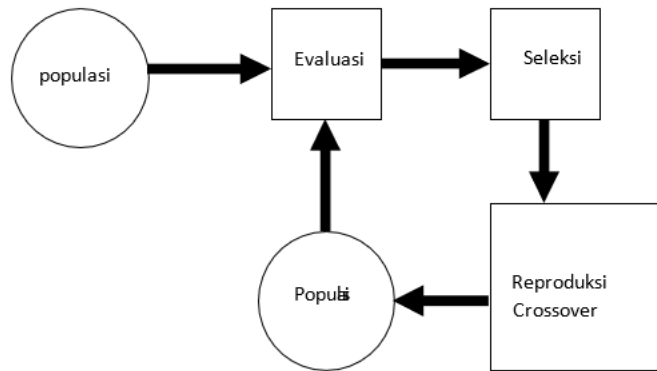
Time to create a schedule with a genetic algorithm
Table 1. Tabel Test Genetic Algorithm

o	Pengujia n Ke-n	Laju Mutasi	Waktu Pembuatan Jadwal
1	Testing on	0,6	2,5 detik
2	Testing on	0,4	2,7 detik
3	Testing on	0,1	2,0 detik
4	Testing on	0,9	2,5 detik
5	Testing on	0,7	2,4 detik

CONCLUSION

From the test results in the table above, it can be concluded that using the fastest genetic algorithm is using a mutation rate of 0.1 because it can match the schedule with the fastest time, namely 2 seconds.

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