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OPTIMIZATION OF RAW MATERIALS STOCK EGGTRAY PT. ERA LIGHT BOX GRESIK USING GENETIC ALGORITHM

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ABSTRACT

Obstacles that occur today in the PT. Era ray Box still use manual calculation for the stock of raw materials, so the impact on the delay in the department information and management company itself. In addition the company also often lose money because the number of ordering goods is increasing and are still using manual calculation so that the risk of causing an invalid calculation and not achieving the target on production.Genetic algorithms are search techniques in computer science to find a settlement forecasts for optimization and search problems. The results of the optimization experiments that have been carried out, the results obtained are different by comparing the 10 iterations, 100 iterations and 1000 iterations. From the experiments performed by the user with a genetic algorithm system in the output of raw materials Dregs S.awal 2438333333 kg, Dregs Exit 3002885622 kg, 342 kg S.awal spindles, spindles Exit 1069444444 kg, 988 kg S.awal Carton, Cardboard Exit 9358 kg, obtained the best fitness value is 28679.2.

Keywords: *Genetic Algorithm Method, system optimization, Optimizing Stock Raw materials in PT. Era ray Box.*

I. INTRODUCTION

Seeing a business opportunity with paper management Alvan and their high level of market needs, then in 1999, PT. Kentajaya start brewing business of making cardboard boxes and renamed PT. Era ray Box. PT. Era ray Box keep working principles of former company, that the production process at the plant was very attentive to the ecosystem and the materials used are recyclable materials that are environmentally friendly.

In inventory management are the principal stages of the inventory contained in a production system of distribution of raw materials and ordering supplies through the productive process. In this system, we must first have the raw materials and supplies in order to carry out the production process. Obstacles that occur today in the PT. Era ray Box still use manual calculation for the stock of raw materials, so the impact on delays information on the department and the management company itself.

Genetic algorithms are search techniques in computer science to find a settlement forecasts for optimization and search problems. In general, genetic algorithms have the genetic representation, by forming the

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population, has value and genetic parameters. Genetic algorithms assessed as having the optimal outcome for many of the problems, it has been demonstrated that the genetic algorithm can generate the optimal solution set that is very useful to many objective. The main strength of the genetic algorithm is its ability to solve complex problems in a relatively quick time.

Based on the background above, hence made this final dissipating cases that are still using manual calculations, so the impact of which delay of information between departments and corporate management. Genetic algorithm methods applied in research to optimize the process of calculating stocks of raw materials in the PT. Era ray Box. This final project

II DESIGN SYSTEMS

2.1 Flowchart

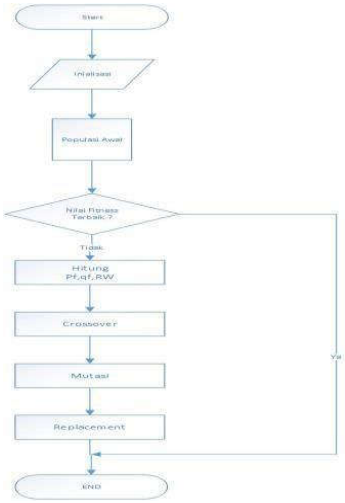

Figure 1 Flowchart Algorithm Genetics

In Figure 1 can be explained beforehand to population data whether it is the best value?, If not he will melakun arithmetic process qf, pf, rw then crossover, mutation, and replacement. After making the process can be obtained the value of the new population.

Figure 2 DFD

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In figure 2 explains that the GA (General Affairs) mengimputkan stock data feedstock into the system Genetic algorithms and then saved the master data and obtain information stocks of raw materials and processes in the system genetic algorithms so that the GA (General Affairs) to get the stock of raw materials accurate.

III IMPLEMENTATION AND TESTING

4.1 Implementation

Examples of implementation of the system are as follows:

Figure 3.1 From the master data

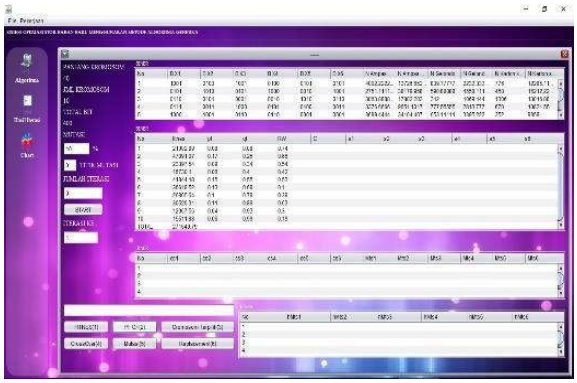

Figure 3.2 Figure 4.3 Chromosome GA Form Selected

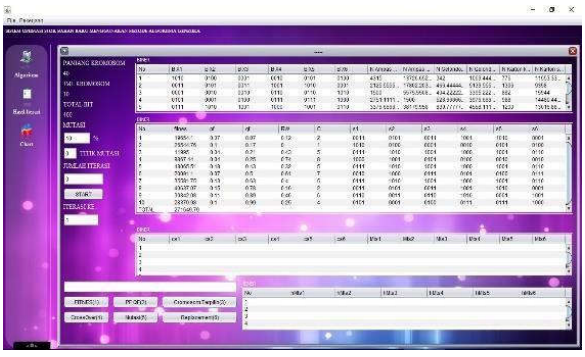

Figure 3.4 Crossover

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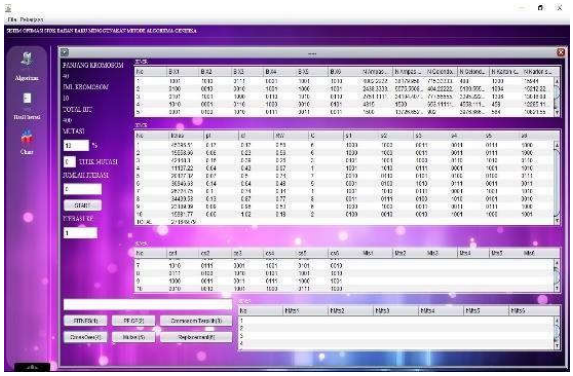

Figure 3.5 Movements

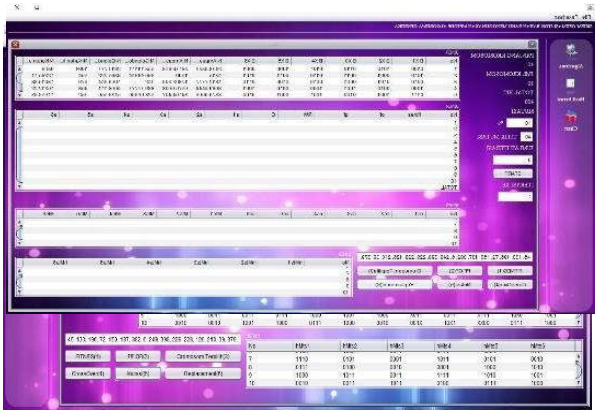

Figure 3.6 Replacement

Figure 3.7 Iteration Output Results

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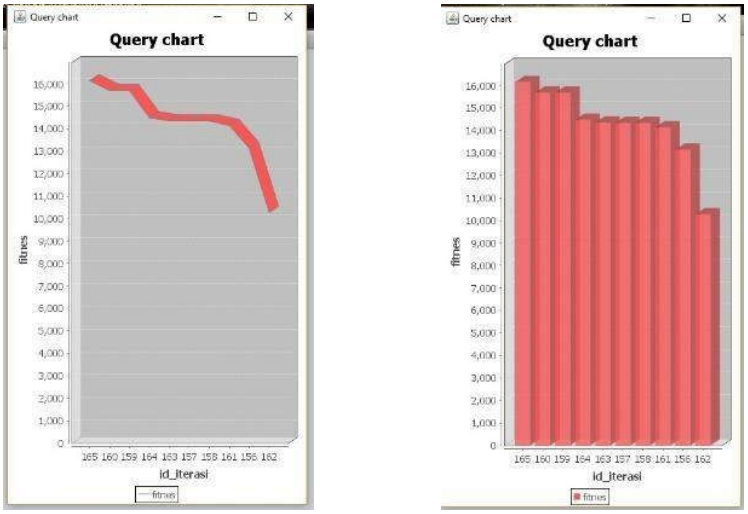

Figure 3.8 The graph line and rod
(Iteration Results 1-10)

3.2 Trial Results

Experiments done is to try the optimization of the data in December 2017. The experiment was performed 3 times, ie for 10 iterations, 100 iterations and 1000 iterations. From the experimental results will be seen whether the system are made capable of doing so Cardboard Exit 352 1306.

Table 3.1 Data Maximum and Minimum Stock of raw materials in the month of December 2017

criteria Goods	Maximum Stock	Minimal Stock
Dregs S.Start	38 180	1,500
Exit dregs	4,315	1,500
Spindles S.Start	488	5,721
Spindles Exit	342	902
Cardboard S.Start	15 944	9358

Table 3.2 Optimization Results with Iteration 10 times

Date and Time	Dregs S Startl	Dregs Out	Logs S.Start	Logs Exit	Cardboard SStart	Cardboard Out
2018-04-24 17:45: 34.0	275 1:11	557 5.5 5	528.67	1069.44	458	159 44

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Table 3.3 Optimization Results with Iteration 100 times

Date and time	Dregs S Start	Dregs Out	Logs S Start	Logs Out	Cardboard S Start	Cardboard Out
2018-04-24 17: 45: 34.0	2751.11	557 5:55	528.67	1069.44	458	15944

Table 3.4 Optimization Results with Iteration 1000 times

Date and Time	Dregs S Start	Dregs Out	Logs S Start	Logs Out	Cardboard S Start	Cardboard Out
2018-04-24 18:11 : 36.0	2751 .11	15 00	653.11	3976.67	13 06	13 01 6.89

Of tables 6.4, 6.5, 6.6 can be seen the results of the optimization of the system with different values. Dregs of optimization results for the most minimum beginning balance is 2751.11, obtained from 10 iterations and 1000 iterations with the fitness value of 17113.66 and 10040. Optimization results for the dregs out the minimum is 1500, obtained from 100 iterations and 1000 iterations, with the value of fitness 147 10040 and 23:44. The results of the optimization for the most minimum beginning balance spindles is 404.22, were obtained from 100 iterations with the fitness value 10040. Optimization results for spindles out the minimum is 1069.44, obtained from 10 iterations, the fitness value 17113.66. Optimization results for Cardboard beginning balance the minimum is 458, obtained from 10 iterations to the value of fitness 17113.66. Optimization results for Cardboard out the minimum is 11553.33, obtained from 10 iteration, the value of fitness 17113.66. And in Table 6.7 is a table value ratio of 10, 100, up to 1000 iterations.

IV CONCLUSION

Conclusions obtained in this study are:

1. At trial the system that has been done shows that the stocks of raw materials in the optimization of the system that produces a fitness that is expected to optimize the ordering and production process with the intent of incoming goods Eggtry to The most minimal warehouse, it is intended to prevent buildup stock baku.dan material orders over raw materials.
2. From the experiments performed by the user with a genetic algorithm system whereby raw material stock Dregs S.awal 2438333333 kg, Dregs Exit 3002885622 kg, spindles S.awal 342 kg, Exit spindles

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1069444444 kg, Cardboard S.awal 988 kg, Cardboard Exit 9358 kg, obtained the best fitness value is 28679.2.

V SUGGESTIONS

From the research that has been done with the author, there are some drawbacks and advice that can be given by the author for further research are as follows:

1. The system will be made to more dynamic in order to accommodate the addition of criteria that might occur, because the system that made the author is still not flexsibel.
2. The selected alternative will be plus so much more.
3. The application can use another application to search for a better fitness
4. In the development can provide solutions better decisions.

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