International Research Journal of Computer Science (IRJCS)
Issue 06, Volume 5 (June 2018)
ISSN: 2393-9842
www.irjcs.com

MEDIATION APPOINTMENT ALGORITHM CONSIDER DIRECTOR & CLIENTS AGENDA

Alpha Purwiko
Faculty of Computer Science, Universitas Mercu Buana, Indonesia
paskalis.alpha@gmail.com
Nurul Achyar
Faculty of Computer Science, Universitas Mercu Buana, Indonesia
aroel.achyar@gmail.com
M Aqsa Gunapraja
Faculty of Computer Science, Universitas Mercu Buana, Indonesia
aqsa.goe@gmail.com
Bagus Priambodo
Faculty of Computer Science, Universitas Mercu Buana, Indonesia
bagus.priambodo@mercubuana.ac.id

Manuscript History
Number: **IRJCS/RS/Vol.05/Issue06/JNCS10098**
Received: 12, June 2018
Final Correction: 17, June 2018
Final Accepted: 25, June 2018
Published: June 2018
Citation: Purwiko, Achyar, Gunapraja & Priambodo (2018). MEDIATION APPOINTMENT ALGORITHM CONSIDER DIRECTOR & CLIENTS AGENDA. IRJCS:: International Research Journal of Computer Science, Volume V, 308-317.
doi://10.26562/IRJCS.2018.JNCS10098
Editor: Dr.A.Arul L.S, Chief Editor, IRJCS, AM Publications, India

Abstract— Effective scheduling systems are essential for client efficiency and satisfaction, especially for dynamic financial services industry. For an example there are many clients who come directly to request the transaction data and mediation process without an appointment in advance. This will cause the scheduling process cannot be done on time following client's demand as constrained by schedule activities of directors who already have other fixed agenda that has been planned previously. We analyze some scheduling algorithm to optimally balance the scheduling of clients by considering the broker, clients and director fixed agenda to solve scheduling problem in Legal and Membership Division of PT. Jakarta Futures Exchange (JFX). In this paper, we analyze three different algorithm programming methods to solve the diversity of client's demands. Experiment result show shortest job first (SJF) algorithm has lowest average waiting time for mediation scheduling comparing with FCFS and Round Robin algorithm.
Keywords— Scheduling algorithms; mediation scheduling; shortest job first algorithm;

I. INTRODUCTION

Scheduling is defined as a plan for the arrangement of the work sequences and the allocation of resources both time and facilities for each operation to be completed(Kenneth R. Baker & Trietsch, 2009). Manually scheduling is still common nowadays. It is difficult to do and take a long time with the quite large level of error that can occur.
PT. Jakarta Futures Exchange (JFX) is a business entity providing the systems and facilities for the sale and purchase of commodities under futures contracts and shariah derivatives contracts or other derivatives contracts. The various activities of selling and buying in futures exchanges are performed by futures brokers who have obtained permission from "Badan Pengawas Pasar Modal dan Keuangan (Bapepam)"(Otoritas Jasa Keuangan, 2012), The futures broker is an entity conducting commodity trading activities based on the customer's mandate.

All trading processes will be supervised by "Badan Pengawas Perdagangan Berjangka Komoditi (Bappebti") to minimize the risk of fraud. In the process, if the customer concern about any indication of fraudulent brokerage, the customer has the right to complain and make a mediation agreement for stockbrokers and JFX. Complaints and mediation measures gradually and there are starting with the Futures Brokers, Futures Exchange, and the Supervisory Board until the completion point is reached(Otoritas Jasa Keuangan, 2011). The scheduling system has been studied over a century ago(K R Baker, 1974)and received many recent updates(Tang, Yan, & Cao, 2014),(Park, Kim, & Jeon, 2018). Many scheduling systems have set up a meeting schedule to customers before their arrival. However, if many customers ask for time to the mediation process, the amount of time will be allocated between the arrival of customers, mediators and brokers.

This is certainly a challenging decision considering the time and previously scheduled agenda of brokerage director. There are various stages to go through the mediation process. There are beginning with complaints, clarification, and scheduling. The Client shall be obliged to make a complaint beforehand to the relevant broker by submitting the complaint form and supporting documents. In the form of a mandate agreement, there will be a proof of initial deposit, transaction history and the client will receive an evidence of complaint. If in the process of a complaint to the broker does not meet an agreement, the client can give the complaint to the JFX. Every complaint that sent to the JFX may end with a mediation process with obtaining explanations and agreements with brokers on the issues that occur. At the beginning of the process, the client will carry the completed complaint form and the client will have to wait for the information from the JFX to clarify the broker over the complaint. If the complaint has the clarity from both parties, the JFX will conduct scheduling and mediation process based on the customer who applied first.

In the process of handling a complaint from the customer can take five business days, followed by clarification of the complaint about 14 working days and 14 working days before they can be mediated with the parties involved. If this mediation process does not reach an agreement, then it will require 14 working days to reschedule the mediation process. It is necessary to have online scheduling systems in such a way that schedule can be adjusted to the agenda of the broker director's activities because mediation rescheduling is rarely done in the financial services industry. In the financial mediation system, achieving this balance is very important because of the high cost of resources, including human and physical resources. The uncertainty of mediation requests often arises because of the uncertain nature of mediation. For example, clients who have already choose the mediation option have been sorted and scheduled for weeks or months in advance on JFX. On the other hand, there are urgent clients who have not yet scheduled because they have not notified or sometimes with much shorter notice, usually it happens a day before the arrival of clients and may have a higher priority for the mediation process.

Furthermore, the exact number that can be scheduled is not known with certainty. Therefore, it is a must to find a solution for client mediation scheduling systems for anticipates potential future needs where additional urgent clients are required. Achieving a balance between these competing needs can be challenging, because of the organized agenda, mediation time, scheduling and timing of mediation. We discussed the system structure from our proposal and in several ways to improve the efficiency of information systems by comparing First Come First Serves (FCFS), Shortest Job First (SJF) and Round Robin algorithms to complete our information systems. We present some theoretical findings based on the case of the problem described to provide some insert into the optimal scheduling decision for larger issues. We present a series of experiments that provide suggestion into the optimal scheduling decisions as well as the performance of our proposed solution method. Based on our information system experiments, we classify issues and divide them into several sections to make it easily solved by computerized. The entire contents of this paper are organized as follows: In Section 2, we provide backgrounds and literature review of scheduling method. In Section 3, we present the definition of the problem and the formulation of the model. Section 4 describes the structural nature of the solution model and methodology, and Section 5 presents the experimental results. And, in Section 6 we discuss our major findings and future research directions. In this paper, every data and information obtained from PT. Jakarta Futures Exchange (JFX) through interviews and study from provided documents.

II. FUNDAMENTAL THEORY

There are many works of literature that addresses the model of the sequencing and scheduling. Broadly speaking, the analysis of the sequencing and scheduling systems is divided into two groups: those who evaluate the schedule,(Muslimah, 2016; Xoxa, Zotaj, Tafa, & Fejzaj, 2014; Zhang, Xie, & Geng, 2014) and those who evaluate the scheduling algorithm for continuously updating the sequencing and the scheduling algorithm (Morad, N,Zalzala, 1999; Pangaribowo, 2014). Patrick Wang (Wang, 1993) has learned about the problems that occur in the scheduling system. The dynamic scheduling is defined when the additional a client was scheduled right after a scheduled client. We use allocation phase type to find out temporary solutions in a single-server scheduling information system and to determine the prime time for each client. In determining a scheduling time of clients, the schedule was divided into several intervals, which are formed based on a scheduling appointment when non-linear equations are solved for any time interval.

The new client placements are determined by intervals that have a minimum objective function value when the main schedule already developed. In this journal, we assume the issue is additional clients who have no attempt to find optimal scheduling that will lead to possible stagnation of additional customer arrivals.Cayirliet (Cayirli, Veral, & Rosen, 2006)developing a simulation model to determine the sequence and schedule for new clients and returning clients. He tested several sorting rules including FCFS and alternating sorts between new clients and returning clients from the beginning of the process.

There are additions to these sequence rules, some scheduling rules for determining scheduling allocations already tested. These rules include allocating equal intervals between clients, double booking of the first two clients (Bailey-The Welch Rules)(Bailey & Ey, 1952), and scheduling two clients at the same time with the same interval. They had a conclusion that sequencing decisions have more impact on system performance than scheduling rules. In another study, Cayirliet (Cayirli, Veral, & Rosen, 2008) considering different environmental characteristics, new clients ratios to perform mediation process have an opportunity to re-engage mediation process if completion point is not reached, and urgent clients who come directly. They conclude the FCFS method because it is not optimally working when there are several classes of clients. They found that different sequencing and scheduling rules should be chosen depending on environmental characteristics. We studied the problems that often occur in the scheduling system with First Come First Serve (FCFS) method. With FCFS system, scheduling is rarely done in sequence and re-scheduling. However, in the FCFS scheduling system, optimal mediation scheduling requests cannot be obtained, as scheduling is done sequentially based on the system regardless of brokerage and broker-dealer activity agendas that previously arranged. In this case, scheduling system should also consider activity agenda that has been prepared when determining the time of mediation. Based on this explanation we decided to do a comparison between different algorithm methods which is FCFS, SJF and Round Robin to obtain the optimal method for the appropriate scheduling system.

III. METHOD

Some of the clients who are requesting the mediation process are mostly clients who feel there is an indication of fraud in their transactions. The client initially requests transaction data and then inspects the data prior to the mediation process, but for some clients, they may proceed through the mediation process conducted by the exchange brokers, the brokerage tools (directors, brokers, marketing, and branch manager) and the client itself if they are unsure of the transaction records. The mediation process can be started after the three actors agreed appointment time that has been determined to reach the final result of the agreement but did not rule out the mediation did not reach a completion point. The entire mediation process will be recorded in a note that will be given to the board of directors of the stock according to the completed date first. In the due to the absence of a good scheduling and unavailability of information systems is usually done manually without any reservation in advance of customers resulting in a delay in delivering the minutes to the stock directors.

In order to maximize and manage mediation requests from clients, the basic information that should be available is to request the director's activity schedule or activities of previous year's director if in the current year cannot be determined. The next process is to ask a mediation request from clients or the request in the previous year as a comparison material to design scheduling system algorithm. The mediation process is done for a maximum of 6 hours on the weekdays in one day attended by customers, 2 mediators and broker directors as participants of mediation and has the possibility of mediator replacement during the mediation process if mediation process mediator cannot continue the assistance because of various matters. To obtain mediation scheduling with the FCFS method, Mediation (TM) could be obtained by Summing (S) which indicates the availability of mediation time that the broker director can give each week in S = {S1 + S2 + S3 ...} and compare it with the list the customer queue (N) who has applied for mediation each week in a month N = {N1 + N2 + N3 ...}, then if we describe formula is:

$$TM = \frac{S\{S1+S2+S3\ldots\}}{N\{N1+N2+N3..\}}$$

If the result is >= 1, then the mediation process would be scheduled in the same month, and if the result is <1, then the mediation process is scheduled in the next month. In this case, it is assumed that all clients who register for mediation process are in urgent, and any time given by the broker directors should be maximized so that the FCFS algorithm system can be considered for formulating the scheduling. The function of our goal in maximizing scheduling with this algorithmic system is to compare the schedule requested by clients with the schedule of the broker director within a month. If there is more than one client in the same week, then we will prioritize for the first registration client who gets the appointment schedule and the next client will wait for the scheduling process afterwards. Most of the research (Erdogan, Gose, & Denton, 2015),(Sivakumar & Srilatha, 2016) in the previous scheduling shows dynamic scheduling following the queue pattern. We do comparison method between FCFS, SJF and Round Robin to get the appropriate and optimal scheduling pattern.

A. First Come First Serve Scheduling

First-Come-First-Serve (FCFS). This algorithm is the simplest scheduling algorithm CPU uses. By using this algorithm any process that is in the ready state is entered into a FIFO or queue sequence with the principle first in first out, according to the time of arrival. The process is the first come that will be executed first.

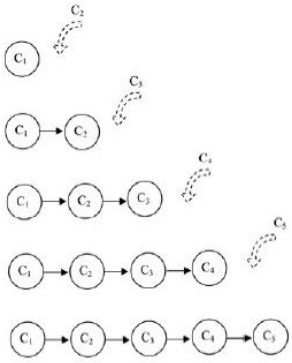

Figure1: FCFS Method Scheduling

FCFS or FIFO can be defined as a process that the first come will be served first. The queue process below it should wait until all the processes above it are completed. Any existing process on ready status will go into the FCFS queue according to the time of arrival(Xoxa et al., 2014). Figure 1 shows how FCFS works.

B. Shortest Job First Scheduling

Shortest-Job-First (SJF). This algorithm is a scheduling algorithm in which the process that takes precedence -the process that has the shortest processing time- The workings of this algorithm is to move the Job shorter than the Job queue that takes more time. The average of the waiting time will be shorter and will optimize the scheduling itself. (Xoxa et al., 2014)(Robin, Putera, & Siahaan, 2016) SJF has two properties in its application:

1. Non-preemptive (cannot be interrupted). This process is selected based on the quickest execution time that is in the line. This process does not permit forms that are in the prepared line to move the procedure being executed despite the fact that the new process has a littler than meeting time.
2. Preemptive (can be interrupted).
   The selection process is determined by the process that has the smallest execution time remaining. This technique is also known as Shortest Remaining Time First.

For SJF algorithm properties method that we use in this writing is Non-preemptive because SJF scheduling Non-preemptive has high efficiency and low turn around time.

C. Round Robin Scheduling

Round Robin (RR) scheduling is performed in turns based on the queue and working on each successive process. The executed and unfinished process will return to the last queue at that time so that the rotation for the execution is like a bracelet(Robin et al., 2016). All processes are considered important and given a certain amount of processing time called quantum or time-slice where the process runs.

And following the Round Robin rule:

- Time Sharing, the basic concept of this algorithm.
- Basically, the principle is almost the same as FCFS, but it is preemptive.
- Quantum Time, the process will be limited by processing time duration.

Round Robin algorithm terms are:

- If the process has Meeting Time<Quantum Time, then the process will run, if it has completed the process can be immediately used by the next process.
- If the process has Meeting Time>Quantum Time, then the process will be terminated if it reaches quantum time. The queue back in tail queue position, and afterwards run the next process based on arrival time.

IV. RESULT AND DISCUSSION

From the sampling data collection in 2017, the average number of client visits who request the mediation process in each month. Table 1 shows the number of client visits in 1 year during 2017. These data show that the graphic relationship made the number of clients who meet with the director of brokers in a month by each week and how many the visits during the year.

Table 1. Customer Visits 2017

Weeks	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	0	0	0	0	0	0	3	0	0	2	1	0
2	0	0	0	0	0	0	1	1	0	0	1	0
3	2	0	0	0	1	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	3	1	0
5	0	0	0	0	0	0	0	0	0	0	0	0

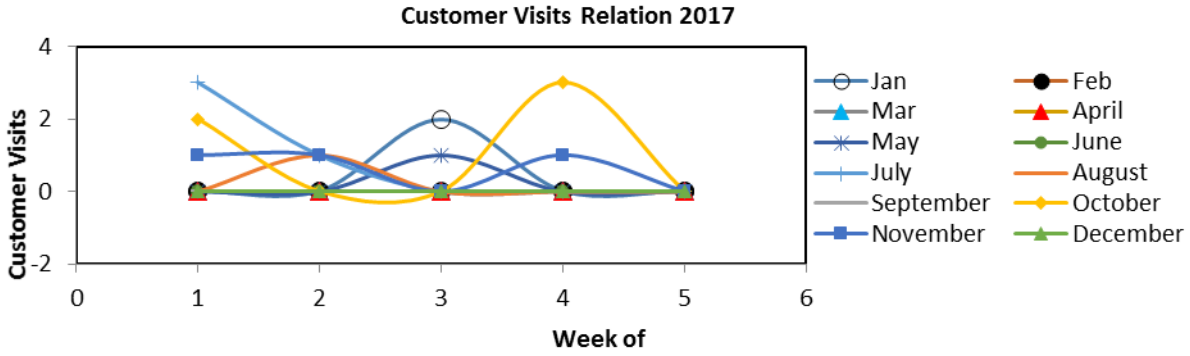

Figure2: Customer Visits Relation 2017

Based on the sampling data, we started to make experiments between the three algorithm methods FCFS, SJF and Round Robin to get optimal scheduling method.

A. First Come First Serve Scenario

From sampling data of clients with estimated arrival time, every month and service waiting time in each process of mediation hence formed table variable of the customer visit.

Months	Arrival Time (AT)	Meeting Time (MT)
M1	2	2
M2	0	1
M3	0	1
M4	0	1
M5	1	1
M6	0	1
M7	4	2
M8	1	1
M9	0	1
M10	5	2
M11	3	2
M12	0	1

So in the process will be considered to find the formula to calculate the total of waiting time in one mediation service as follows:

$$WTn = \sum_{i=1}^{n-1} (MT) - ATn$$

$$TWT = \sum WT$$

With AT and MT already obtained it can be calculated the total average time in the FCFS method. There are:

WT1 = M1AT
= 2
WT2 = M1MT – M2AT
= 2 – 0
= 2
WT3 = M1MT + M2MT – M3AT
= 2 + 1 - 0
= 3

WT4 = M1MT + M2MT + M3MT – M4AT
= 2 + 1 + 1 – 0 = 4
WT5 = M1MT + M2MT + M3MT + M4MT – M5AT
= 2 + 1 + 1 + 1 – 1 = 4
WT6 = M1MT + M2MT + M3MT + M4MT + M5MT – M6AT
= 2 + 1 + 1 + 1 + 1 - 0
= 6
WT7 = M1MT + M2MT + M3MT + M4MT + M5MT + M6MT – M7AT
= 2 + 1 + 1 + 1 + 1 + 1 - 4
= 3
WT8 = M1MT + M2MT + M3MT + M4MT + M5MT + M6MT + M7MT – M8AT
= 2 + 1 + 1 + 1 + 1 + 1 + 2 - 1
= 8
WT9 = M1MT + M2MT + M3MT + M4MT + M5MT + M6MT + M7MT + M8MT – M9AT
= 2 + 1 + 1 + 1 + 1 + 1 + 2 + 1 - 0
= 10
WT10 = M1MT + M2MT + M3MT + M4MT + M5MT + M6MT + M7MT + M8MT + M9MT – M10AT
= 2 + 1 + 1 + 1 + 1 + 1 + 2 + 1 + 1 - 5
= 6
WT11 = M1MT + M2MT + M3MT + M4MT + M5MT + M6MT + M7MT + M8MT + M9MT + M10MT – M11AT
= 2 + 1 + 1 + 1 + 1 + 1 + 2 + 1 + 1
+ 2 - 3
= 10
WT12 = M1MT + M2MT + M3MT + M4MT + M5MT + M6MT + M7MT + M8MT + M9MT + M10MT + M11MT – M12AT
= 2 + 1 + 1 + 1 + 1 + 1 + 2 + 1 + 1 + 2 + 2 - 0
= 15
TWT = WT1 + WT2 + WT3 + WT4 + WT5 + WT6 + WT7 + WT8 + WT9 + WT10 + WT11 + WT12
= 2 + 2 + 3 + 4 + 4 + 6 + 3 + 8 + 10 + 6 +10 + 15
= 73
AWT = TWT / TOTAL MONTHS
= 73 / 12
= **6.1**

The description below shows how a time is divided based on the FCFS Algorithm process.

M1	M2	M3	M4
M5	M6	M7	M8
M9	M10	M11	M12

Through algorithm testing that we have been done, we obtained an optimal result of 6.1 units of time for an average waiting time client in the mediation process with the First Come First Serve (FCFS) algorithm.

B. Shortest Job First Scenario

The following is client-sampling data using the SJF method, which estimates monthly arrival time and service waiting times based on the FCFS method and calculates each of the shortest mediation processes.

Months	Arrival Time (AT)	Meeting Time (MT)
M2	0	1
M3	0	1
M4	0	1
M9	0	1
M6	0	1
M12	0	1
M5	1	1
M8	1	1
M1	2	2
M11	3	2
M7	4	2
M10	5	2

Calculate the calculation of Total Wait Time (TWT) and Average Wait Time (AWT) with SJF method, there are:

WT1 = M2AT
= 0
WT2 = M2MT – M3AT
= 1 – 0
= 1

WT3 = M2MT + M3MT – M4AT
= 1 + 1 - 0
= 2
WT4 = M2MT + M3MT + M4MT – M9AT
= 1 + 1 + 1 - 0
= 3
WT5 = M2MT + M3MT + M4MT + M9MT – M6AT
= 1 + 1 + 1 + 1 - 0
= 4
WT6 = M2MT + M3MT + M4MT + M9MT + M6MT – M12AT
= 1 + 1 + 1 + 1 + 1 - 0
= 5
WT7 = M2MT + M3MT + M4MT + M9MT + M6MT + M12MT – M5AT
= 1 + 1 + 1 + 1 + 1 + 1 – 1
= 5
WT8 = M2MT + M3MT + M4MT + M9MT + M6MT + M12MT + M5MT – M8AT
= 1 + 1 + 1 + 1 + 1 + 1 + 1 – 1
= 6
WT9 = M2MT + M3MT + M4MT + M9MT + M6MT + M12MT + M5MT + M8MT – M1AT
= 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 - 2
= 7
WT10 = M2MT + M3MT + M4MT + M9MT + M6MT + M12MT + M5MT + M8MT + M1MT – M11AT
= 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 2 - 3
= 7
WT11 = M2MT + M3MT + M4MT + M9MT + M6MT + M12MT + M5MT + M8MT + M1MT + M11MT – M7AT
= 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 2 +
2 - 4
= 8
WT12 = M2MT + M3MT + M4MT + M9MT + M6MT + M12MT + M5MT + M8MT + M1MT + M11MT + M7MT – M10AT
= 1 + 1 + 1 + 1 + 1 + 1 + 1 +1 + 1 + 2 + 2 + 4 – 5
= 9
TWT = WT1 + WT2 + WT3 + WT4 + WT5 + WT6 + WT7 + WT8 + WT9 + WT10 + WT11 + WT12
= 0 + 1 + 2 + 3 + 4 + 5 + 5 + 6 + 7 + 7 + 8 + 9
= 57
AWT = TWT / TOTAL MONTHS
= 57 / 12
= **4.75**

The algorithm testing that has been done, then obtained the optimal result of **4.75** units of time for the average client waiting time in the process of mediation with Shortest Job First (SJF) algorithm.
The description below shows how a time is divided based on the SJF Algorithm process.

M1	M2	M3	M4
M5	M6	M7	M8
M9	M10	M11	M12

C. Round Robin Scenario

Calculations in Round Robin are more difficult than the previous calculations. In this algorithm, we need to divide the best time becomes several subprocesses in a period. Quantum Time is a time slicing technique for dividing meeting time into several subprocesses. Testing with the same data with different quantum time gives different AWT. Herewith calculation results for different quantum time:

Quantum Time = 1
Total Waiting Time = 69
Process = 12

Average Waiting Time = 69/12
= **5.75**
Quantum Time = 6
Total Waiting Time = 67
Process = 12
Average Waiting Time = 67/12
= **5.58**

If the Quantum Time value is greater than the available Meeting time, Round Robin will transform into FCFS algorithm to run the next process.

Here's the calculation explanation based on the table:

Months	Arrival Time (AT)	Meeting Time (MT)	Quantum Time	Start Time	Finish Time	Waiting Time
M1	2	2	1	9	14	10
M2	0	1		0	1	0
M3	0	1		2	3	2
M4	0	1		3	4	3
M5	1	1		7	8	6
M6	0	1		4	5	4
M7	4	2		11	16	10
M8	1	1		8	9	7
M9	0	1		5	6	5
M10	5	2		12	17	10
M11	3	2		10	15	6
M12	0	1		6	7	6
Total						**69**
Average						**5.75**

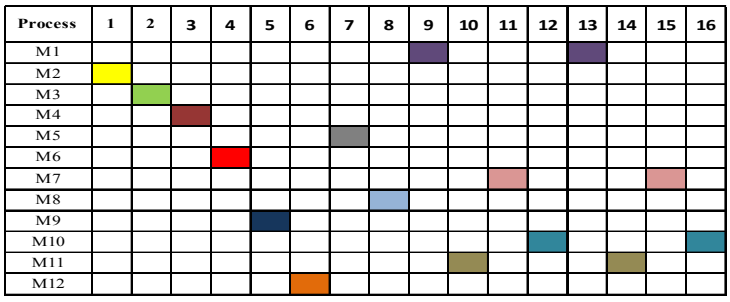

Figure3: Process Round Robin Quantum Time 1

Months	Arrival Time (AT)	Meeting Time (MT)	Quantum Time	Start Time	Finish Time	Waiting Time
M1	2	2	6	9	11	7
M2	0	1		0	1	0
M3	0	1		2	3	2
M4	0	1		3	4	3
M5	1	1		7	8	6
M6	0	1		4	5	4
M7	4	2		13	15	9
M8	1	1		8	9	7
M9	0	1		5	6	5
M10	5	2		15	17	10
M11	3	2		11	13	8
M12	0	1		6	7	6
Total						**67**
Average						**5.58**

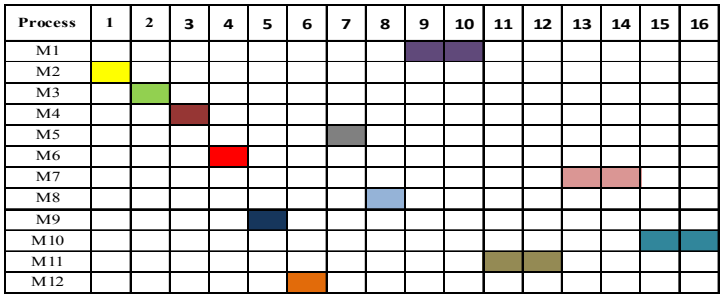

Figure4: Process Round Robin Quantum Time 6

Figures 3 and 4 show the time split representing each process by performing the Round Robin algorithm on the different value of Quantum Time. Quantum Time affects the results of the average waiting time. If Quantum Time is larger, the average waiting time will produce a small value, but the process that has been in the queue will take longer to get their turn because the process ahead will be solved before the quantum time out of time.

V. CONCLUSION

We analyze FCFS, SJF and Round Robin algorithm to solve mediation scheduling problem in PT. Jakarta Futures Exchange (JFX). Experiment result show shortest job first (SJF) algorithm has lowest average waiting time compare with FCFS and round robin algorithm. However, FCFS is better used if the process is not excessive. SJF can be used optimally if the process comes together and requires scheduling that can be sorted by the length of process time. While Round Robin is better used to adjust the average waiting time when in the process cannot be completed at one time.

Also based on experiment result we discovered that some algorithms can be used together (mixed) to obtain the most optimal results. For an example, if there are many mediation requests, while the time available for the mediation process is limited, the SJF algorithm can be used as a reference for performing the scheduling process, otherwise, if the mediation request comes not consecutively, then the FCFS is used. The Round Robin process can be used when the process of mediation time exceeds the time limit of maximum mediation process (more than 6 hours) and takes longer in the process. Because scheduling using this method, processes with shorter processing times will be completed first, although there is a process with a long process time is in the first queue, whereas if there is a process in the second queue with a shorter processing time, then the process on the first queue can be interrupted to work on the second queued process first to complete, assuming preemptive scheduling is not a priority. The process with the shortest processing time will be solved first, after that new other processes that have a longer processing time. Using the SJF has the lowest average waiting time, but there are still constraints in setting up a time-table that is often unpredictable from the beginning, it becomes a work to be done in the future, that every mediation request must be initiated by the weight of the problem before mediation, with optimally determined meeting time and scheduling process with SJF can run accurately and effectively.

REFERENCES

1. Bailey, N. T. J., & Ey, N. T. J. B. (1952). A Study of Queues and Appointment Systems in Hospital Out-Patient Departments, with Special Reference to Waiting-Times. Source Journal of the Royal Statistical Society. Series B (Methodological) Journal of the Royal Statistical Society. Series B, 14(2), 185–199. Retrieved from http://www.jstor.org/stable/2983867%5Cnhttp://about.jstor.org/terms
2. Baker, K. R. (1974). Introduction to Sequencing and Scheduling. Handbooks in Operations Research & Management Science, 28(1), : 203. https://doi.org/10.1057/jors.1977.60
3. Baker, K. R., & Trietsch, D. (2009). Principles of Sequencing and Scheduling. Principles of Sequencing and Scheduling. https://doi.org/10.1002/9780470451793
4. Cayirli, T., Veral, E., & Rosen, H. (2006). Designing appointment scheduling systems for ambulatory care services. Health Care Management Science, 9(1), 47–58. https://doi.org/10.1007/s10729-006-6279-5
5. Cayirli, T., Veral, E., & Rosen, H. (2008). Assessment of patient classification in appointment system design. Production and Operations Management, 17(3), 338–353. https://doi.org/10.3401/poms.1080.0031
6. Erdogan, S. A., Gose, A., & Denton, B. T. (2015). Online appointment sequencing and scheduling. IIE Transactions (Institute of Industrial Engineers), 47(11), 1267–1286. https://doi.org/10.1080/0740817X.2015.1011355
7. Morad, N,Zalzala, A. (1999). Genetic algorithms in integrated process planning and scheduling. Journal of Intelligent Manufacturing, 10(2), 169–179. https://doi.org/10.1023/A:1008976720878
8. Muslimah, S. K. (2016). Prioritas Dengan Pendekatan Metode Regresi Linear Multiple. Sinergi, 20(1), 21–26.
9. Otoritas Jasa Keuangan. (2011). Undang-Undang Republik Indonesia Nomor 10 Tahun 2011 Tentang Perdagangan Berjangka Komoditi.
10. Otoritas Jasa Keuangan. (2012). Undang-Undang Republik Indonesia Nomor 8 Tahun 1995 Tentang Pasar Modal. Retrieved from http://www.ojk.go.id/id/kanal/pasar-modal/regulasi/undang-undang/Documents/Pages/undang-undang-nomor-8-tahun-1995-tentang-pasar-modal/UU Nomor 8 Tahun 1995 (official).pdf
11. Pangaribowo, T. (2014). IMPLEMENTASI ALGORITMA LOGIKA FUZZY PADA PROSES SELEKSI PENERIMAAN MAHASISWA BARU (Diterapkan Pada Politeknik Kotabaru). Sinergi, 18(1), 53–60.
12. Park, J. K. Y. U., Kim, J., & Jeon, H. S. (2018). SCHEDULING ALGORITHMS FOR MULTICORE SYSTEMS BASED ON APPLICATION CHARACTERISTICS, 96(3), 811–821.
13. Robin, R., Putera, A., & Siahaan, U. (2016). Comparison Analysis of CPU Scheduling : FCFS, SJF and Round Robin. International Journal of Engineering Development and Research, 4(3), 124–131.

14. Sivakumar, B., & Srilatha, K. (2016). Online Appointment Reservation and Scheduling. Research Journal of Pharmaceutical, Biological and Chemical Sciences, 7(3), 365–373. https://doi.org/10.15680/IJIRCCE.2016.
15. Tang, J., Yan, C., & Cao, P. (2014). Appointment scheduling algorithm considering routine and urgent patients. Expert Systems with Applications, 41(10), 4529–4541. https://doi.org/10.1016/j.eswa.2014.01.014
16. Wang, P. P. (1993). Static and dynamic scheduling of customer arrivals to a single-server system. Naval Research Logistics (NRL), 40(3), 345–360. https://doi.org/10.1002/1520-6750(199304)40:3<345::AID-NAV3220400305>3.0.CO;2-N
17. Xoxa, N., Zotaj, M., Tafa, I., & Fejzaj, J. (2014). Simulation of First Come First Served (FCFS) and Shortest Job First (SJF) Algorithms. IJCSN -International Journal of Computer Science and Network ISSN, 3(6), 2277–5420.
18. Zhang, Z., Xie, X., & Geng, N. (2014). Simulation-based surgery appointment sequencing and scheduling of multiple operating rooms. In IEEE International Conference on Automation Science and Engineering (Vol. 2014–Janua, pp. 399–404). https://doi.org/10.1109/CoASE.2014.6899356