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Analysis of Adaptive Scheduling Production Planning in Palembang's Jumputan Industry

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Abstract

Destination Palembang has some cultural heritages, one of that is the jumputan fabric. One of the jumputan fabric production places in Palembang is the Griya Tuan Kentang Industry. However, in the process, the production of jumputan fabric still uses a manual process including scheduling the production process. This study aims to analyze the management of jumputan production scheduling in the Griya Tuan Kentang Industry. The population of this study was 20 craftsmen but the researcher only conducted interviews with 1 craftsman as the owner of Juanda jumputan. This research was conducted using qualitative descriptive analysis methods. Data analysis techniques using descriptive qualitative are one type of research whose research result research is not obtained through statistical procedures or other quantification methods. The results of this study were carried out by trying the number of orders based on sales history in April 2022Based on sales history in April 2022, there are 6 orders for 735 sheets with a size of 3 x 1.5 m with a total number of workers of 143 persons who have their respective duties and responsibilities per stage so that all orders can be completed within 87 days.

Keywords
scheduling; EDF; jumputan

I. Introduction

Palembang is one of the big cities in Indonesia that has a cultural heritage, characteristics, and various other diversity. One of Indonesia's cultural heritages in Palembang is jumputan batik. Jumputan batik is a type of batik that has a high selling value and has many variations in its manufacturing technique. There are many jumputan batik production places in Palembang, one of which is in the Tuan Kentang area. Tuan Kentang's Jumputan Industry is one of the UMKM where jumputan batik products are superior products in the community in Palembang. This industry usually still uses simple technology in all its processes. The process of making jumputan batik starting from the procurement of raw materials, and production to sales is carried out on a manual scale, especially in the scheduling process. Scheduling is an activity to determine when a job is done. In the production process, scheduling plays an important role in allocating resources such as machinery and labor. During this time, manufacturers produce the number of jumputan to be made based on sales history from previous years. The absence of a real-time system in the production planning process can create a new problem. This is a problem when there are orders that are not expected in large quantities due to unprepared raw materials and unscheduled production times. One of the consequences that arise from these problems is the loss of consumer confidence, it can cause a decrease in sales levels. Organization must have a goal to be achieved by the organizational members (Niati et al., 2021). The success of leadership is partly determined by the ability of leaders to develop their organizational culture. (Arif, 2019).

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Based on the problems above, one alternative solution is to analyze the management of the jumputan production schedule so that when there is a large number of orders at a certain time, the seller can predict whenever the right schedule to carry out the production process from start to finish at a predetermined time. Unlike manual scheduling, a real-time system will help the production planning process so that when there is an order on a certain date, the system will show recommendations regarding schedules ranging from preparing raw materials to carrying out the production process until the goods are ready for sale. Customer demands can also be optimally met from the increase in IT development innovations implemented. In addition, the direct and indirect impact is also felt from the application of IT as an important factor in the supply chain. Many methods can be used to structure the scheduling process, one of which is Adaptive Scheduling with EDF (Earlier-Deadline First). EDF is a dynamic scheduling algorithm that puts the queue process in a priority-based manner in a real-time system.

II. Review of Literature

2.1 Production Scheduling

Production scheduling is a process where the result is a grouping, selection, and timing of. The use of its resources is from the decision-making process. Controlling production activities can be done by scheduling production so that production failures can be minimized.

2.2 Real-Time Scheduling System

Real-time is an operating system in which all tasks can be processed according to the priority level simultaneously with the right results in time. A system can be said to be real-time if:

1. Have a time limit and meet deadlines.
2. Predictable.
3. Have concurrent processes.
4. Increase the number of tasks completed by making the processor work faster.
5. The degree of time efficiency is found.

There are several types of real-time systems, namely hard real-time, soft real-time, semi-soft real-time or semi-hard real-time, interactive deadlines, statistics, and RTS intelligence.

a. Hard Real-Time

Hard real-time systems have a rigid demand system. This system is needed to complete tasks that have a certain time guarantee and the application will fail if the time needs are not met. In general, the time guarantee is sent along with the process to be carried out to run or complete the I/O. If the process is not possible then scheduling can guarantee completion or deny the request. Therefore, the maximum time must be guaranteed in each operation. This kind of thing cannot be done in a system with virtual memory or secondary storage. In everyday life, an example of the application of this system can be seen in the mechanism of the aircraft controller. The uncontrolledness of an aircraft can be a fatal mistake if there is a delay because it is related to human life. A hard real-time diagram can be seen in Figure 2.1 below.

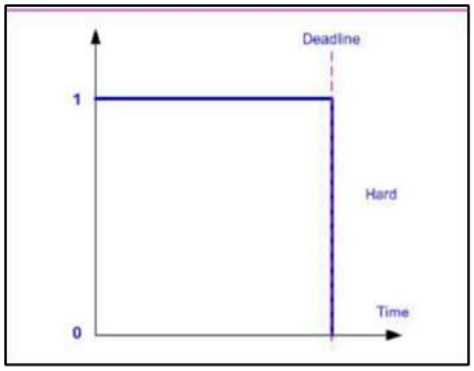

Figure 1. *Hard Real-Time Graphics*

b. Soft Real-Time

Soft real-time has no guarantees when scheduling critical real-time processes so it can result in longer delays, injustices in resource sharing, or cause starvation. A system that can support multimedia, high-speed graphics, and an unacceptable variety of tasks because it does not support soft real-time computing is a possible to result to be obtained in this system. Usually, the software will only get priority in carrying out its processes so that the consequences of failure risks are not too fatal. An example in everyday life that implements this system is a waiter/vending tool. Delays in this system will cause financial losses but do not cause accidents or other fatalities. The delay in this case occurs due to a decrease in quality which becomes slower to work compared to when the engine was new. Unlike ¬hard real-time which at the time the application is still running will be immediately stopped if the given time limit has expired, soft real-time will provide time tolerance or stop the work gradually. A soft real-time diagram can be seen in Figure 2. below.

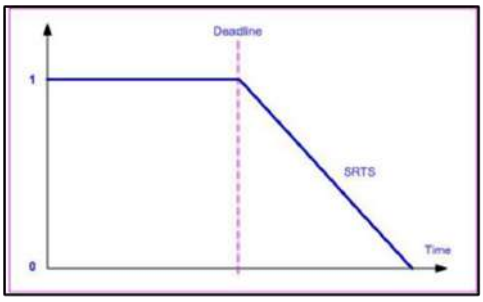

Figure 2. *Soft real-time graphics*

c. Earlier Deadline First (EDF)

Earlier Deadline First is an algorithm that creates a dynamic schedule of task work by prioritizing tasks that have the closest deadline compared to longer deadlines. The rule on EDF is that when a task is being executed, the deadline must be notified to the system because the priority on the EDF is dynamic and always adjusts to the new task being executed. For example, there are processes P1 and P2. If P1 has an execution time of 25 with a period of 50 and P2 has an execution time of 35 and a period of 80 then the Gant-chart for this case can be seen in Figure 3.

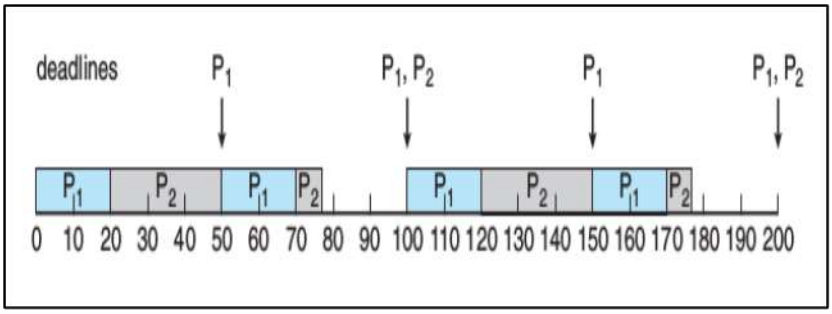

Figure 3. *Gant-chart case earlier deadline first*

III. Research Method

The type of research used in this study is descriptive research with a qualitative approach. Qualitative research methods are one type of research whose research has not been obtained through statistical procedures or other quantification methods.

In this study, the authors used primary data, which is data collected by researchers from the first source. The main source of data in this study is craftsmen in the Griya Tuan Kentang Industry

IV. Result and Discussion

4.1 Data obtained

a. Stages of Jumputan Making

Based on the results of the interview, there are 11 stages in the making which can be seen in the table 1.

Table 1. Stages of the making jumputan

NO	Stages of Making Jumputan	Creation time
1	Cutting	07.00 – 12.00
2	Motive Making	10.00 – 16.00
3	Tailoring	09.00 – 16.00
4	Rope binding	10.00 – 16.00
5	Soaking	13.00 – 16.00
6	Mastery	10.00 – 16.00
7	Coloring	08.00 – 16.00
8	Prewash	08.00 – 16.00
9	Rope Removal	08.00 – 16.00
10	Final wash	08.00 – 16.00
11	Drying	08.00 – 16.00

Source: Primary Data Processing, 2022

b. Types of Motives

According to Mrs.Sri, 6 types of jumputan motive are usually made by Tuan Kentang's craftsmen, namely the Point 7, Point 9, Sunflower, Sasirangan / lepeng, Pattern, and Sow Flower motive. The size of the fabric that is usually made is of 3 x 1.5 m per sheet of fabric. Each motif has its own estimated manufacturing work. The estimated manufacturing time of each motif can be seen in Table 2.

Table 2. Estimated motive time per stage

NO	Types of motive Stages Manufacture	Day						Minute				
		1	2	3	4	5	6	7	8	9	10	11
1	Point 7	1	1	14	7	1	2	15	120	180	15	180
2	Point 9	1	1	21	8	1	2	15	120	180	15	180
3	Flower sun	1	1	7	3	1	2	15	120	180	15	180
4	Sasirangan/lepen	1	1	14	3	1	2	15	120	180	15	180
5	Pattern	1	1	3	2	1	2	15	120	180	15	180
6	Sow Flowers	1	1	1	2	1	2	15	120	180	15	180

Source: Primary Data Processing, 2022

Based on Table 2 above, the total days per motif can be obtained which can be seen in table 3.

Table 3. Total Days

NO	Types of Motives	Total Days
1	Point 7	26
2	Point 9	34 4
3	Sunflowers	15
4	Sasirangan/lepeng	12
5	Pattern	10
6	Sow Flowers	8

Source: Primary Data Processing, 2022

From table 3 above, it can be seen that the type of motif that uses a longer time is a 9-point motif with a manufacturing period is 34 days and the less time is a sow flower motif with a manufacturing period is 8 days

c. The Number of Workers

The following is data on the number of workers at each stage of making jumputan fabrics in Juanda Jumputan

Table 4. Number of Workers

No.	Stages of manufacture	Production Code	Number of Workers	Each person's ability per period
1	Cutting	A	2 persons	100 sheets/ day
2	Motive making	B	3 people	50 sheets/ day
3	Tailoring	C	65 people	1 sheet/period
4	Rope binding	D	65 people	1 sheet/ period
5	Soaking	E	2 persons	50 sheets/day
6	Mastery	F	2 persons	50 sheets/ period
7	Coloring			
8	Prewash			

9	Rope Removal	G	4 people	25 sheets/day
10	Final wash			
11	Drying			

Source: Primary Data Processing, 2022

d. Order Assumptions

In this study, the researcher assumes the order is by the history of sales data in the craftsman in April 2022

Table 5. Order Assumptions

NO	Types of Motifs Ordered	Order Quantity	Deadline
1	Point 9	50 sheets	90 days
2	Point 7	50 sheets	90 days
3	Sunflowers	150 sheets	60 days
4	Sasirangan	100 sheets	50 days
5	Pattern	250 sheets	55 days
6	Sow Flowers	135 sheets	65 days

Source: Primary Data Processing, 2022

e. Managing Production Scheduling with EDF

In this study, the researcher applies the EDF algorithm (Earlier-Deadline First) which means that orders that have less deadline time will take precedence over their work. So that the order of work in the order that was done at the beginning was an order with sasirangan motifs, patterns, sunflowers, sow flowers, point 7, and point 9. The management of production scheduling is as follows:

Table 6. The process of implementing scheduling management

Order	Sum	Day 1	Day 2		Day 3	Day 4	Day 5	Day 6	Day 7
Sasirangan	100	A:1(100)	B: 2(100)		C: 65(65)	C: 65(65)	C: 65(65)	C: 65(65)	C:65(65)
Pattern	250	A :(100)	A:2(150) B :1(50)		B :3(150)	B :1(50)			
Sunflowers	150				A:2(150)	B: 2(100)	B :1(50)		
Sow Flowers	135					A:2(135)	B: 2(100)	B :1(35)	
Point 9	50						A :1(50)	B :1(50)	
Point 7	50						A :1(50)	B :1(50)	

Based on the data table in the first week above, it can be seen that,

1. Sasirangan motif: On the first day working on the cutting stage (production code A) with 1 worker as many as 100 pieces of fabric. On the 2nd day carried out the making of motifs (production code B) with 2 workers for as many as 100 pieces of fabric. From day 3 to day 7, suturing was carried out (production code C) with 65 workers as many as 65 pieces of fabric per day.

2. Pattern Motive: On the first day working on the cutting stage (production code A) with 2 workers on 100 pieces of fabric. On the 2nd day carried out fabric cutting by 2 workers as many as 150 pieces of fabric and making motifs (production code B) with 1 worker as many as 50 pieces of fabric. Day 3 was carried out by making motifs with 3 workers with as many as 150 pieces of fabric. Day 4 was still doing motives with 1 worker as many as 50 pieces of fabric.
3. Kembang Matahari Motif: Cutting started on the 3rd day with 2 workers and as many as 150 fabrics. Day 4 continued with making motifs with 2 workers with as many as 100 pieces of fabric and continued until the 5th day with 1 worker with as many as 50 pieces of fabric.
4. Sow Flower Motif: The cutting stage starts on the 4th day with 2 workers on as many as 135 pieces of fabric. On the 5th day, proceeded to the stage of making motifs with 2 workers with as many as 100 pieces of fabric and continued on the 6th day with 1 worker with as many as 35 pieces of fabric.
5. Point 9 motif: The cutting stage starts on the 5th day with 1 worker as many as 50 pieces of fabric and continues to the stage of making motifs on the 6th day with 1 worker as many as 50 pieces of fabric.
6. Point 7 motif: The cutting stage starts on the 5th day with 1 worker as many as 50 pieces of fabric and continues to the stage of making motifs on the 6thday with 1 worker as many as 50 pieces of fabric.

Table 7.

Order	**Day 8**	**Day 9**	**Day 10**	**Day 11**	**Day 12**	**Day 13**	**Day 14**
Sasirangan	C:65(65)	C:65(65)	C: 65(65)	C:65(65)	C : 65(65)	C : 65(65)	C : 65(65)
Pattern							
Sunflowers							
Sow Flowers							
Point 9							
Point 7							

Based on the table data in the 2nd week above, it can be seen that the orders carried out are only orders for sasirangan motifs at the tailoring stage (production code C) from day 8 to day 14 with 65 workers with as many as 65 pieces of fabric per day.

Table 8.

Order	**Day 15**	**Day 16**	**Day 17**	**Day 18**	**Day 19**	**Day 20**	**Day 21**
Sasirangan	C : 65(65)	C : 65(65)	C: 35(35) D : 65(65)	C:35(35) D : 65(65)	C : 35(35) D : 65(65)	C : 35(35) E : 2(65)	C : 35(35) F : 2(65)
Pattern			C : 30(30)	C : 30(30)	C : 30(30)	C : 30(30) D : 30(30)	C : 30(30) D : 30(30)
Sunflowers							
Sow Flowers							

Point 9							
Point 7							

Based on the data in the 3rd-week table above, it can be seen that:

1. Sasirangan motif: On the 15th and 16th days, a tailoring process was carried out with 65 workers as many as 65 pieces of fabric per day. From the 17th to the 19th day, 35 workers were tailoring with 35 pieces of fabric per day and rope binding with 65 workers as many as 65 pieces of fabric per day. On the 20th day, tailoring was carried out with 35 workers with as many as 35 pieces of fabric and soaking a fabric with 2 workers with as many as 65 pieces of fabric. Furthermore, on the 21st day, he was still tailoring with 35 workers with as many as 35 pieces of fabric and mastery (production code F) with 2 workers with as many as 65 pieces of fabric.
2. Pattern Motif: From the 17th to the 21st day, a tailoring process was carried out with 30 workers on as many as 30 pieces of fabric per day. From the 20th to the 21st day, a rope binding process was also carried out with 20 workers on as many as 30 pieces of fabric.

Table 9.

Order	**Day 22**	**Day 23**	**Day 24**	**Day 25**	**Day 26**	**Day 27**	**Day 28**
Sasirangan	C : 35(35) F : 2(65)	D : 35(35) G : 3(65)	D : 35(35)	E : 1(35)	F : 1(35)	F : 1(35)	G : 2(35)
Pattern	C : 30(30) E : 1(30)	C : 65(65) D : 30(30) F : 1(30)	C : 65(65) D : 30(30) F : 1(30)	C : 65(65) E : 1(30) G : 2(30)	C : 65(65) D : 65(65) F : 1(30)	C : 65(65) D : 65(65) F : 1(30)	C : 65(65) E : 2(65) G : 2(30)
Sunflowers							
Sow Flowers							
Point 9							
Point 7							

Based on the data in the week 4th table above, it can be seen that:

1. Sasirangan Motif: On the 22nd day, a tailoring process was carried out with 35 workers on as many as 35 pieces of fabric. In addition, a mastery process was also carried out with 2 workers on as many as 65 pieces of fabric. On the 23rd day, a rope binding process was carried out with 35 workers on as many as 35 pieces of fabric and a coloring process was carried out up to drying with 3 workers on as many as 65 sheets of fabric. Furthermore, on the 24th day, only the rope binding process was carried out with 35 workers with as many as 35 pieces of fabric. On the 25th day, the soaking process was carried out with 1 worker on as many as 35 pieces of fabric. On the 26th and 27th days, carried out the mastery process with 1 worker as many as 35 pieces of fabric per day. On the 28th day, carried out the coloring process until drying by 2 workers as many as 35 pieces of fabric. All orders for sasirangan motifs have been completed by the 28th day
2. Pattern Motif: From the 22nd to the 28th day, a tailoring process was carried out with 30 workers on as many as 30 pieces of fabric on the first day and continued with 65

workers on as many as 65 sheets of fabric per day. Furthermore, on the 22nd day, a soaking process was carried out with 1 worker on as many as 30 pieces of fabric. From day 23 to day 24, a rope binding process was carried out with 30 workers with as many as 30 pieces of fabric per day and mastery by 1 worker with as many as 30 pieces of fabric per day. On the 25th day, carried out the soaking process by 1 person with as many as 30 pieces of fabric and the coloring process up to drying by 2 people with as many as 30 pieces of fabric. On the 26th and 27th days, carried out the rope binding process of 65 pieces of fabric and the possession by 1 worker of 30 pieces of fabric. On the 28th day, carried out the soaking process by 2 workers as many as 65 pieces of fabric and coloring up to the drying by 2 workers as many as 30 pieces of fabric.

Table 10.

Order	**Day 29**	**Day 30**	**Day 31**	**Day 32**	**Day 33**	**Day 34**	**Day 35**
Sasirangan							
Pattern	C : 60(60) D : 65(65) F : 2(65)	C : 60(60) D : 65(65) F : 2(65)	C : 60(60) E : 2(65) G : 3(65)	D : 60(60) F : 2(65)	D : 60(60) F : 2(65)	E : 2(60) G : 3(65)	F : 2(60)
Sunflowers	C : 5(5)	C : 5(5)	C : 5(5)	C : 65(65) D : 4(4)	C : 65(65) D : 5(5)	C : 65(65)	C : 65(65) E : 1(5)
Sow Flowers							
Point 9							
Point 7							

Based on the data table in week 5, it can be seen that:

1. Pattern Motif: On the 29th and 30th days, a tailoring process was carried out by 60 workers with as many as 60 pieces of fabric per day, a rope binding process by 65 workers with as many as 65 pieces of fabric per day, and a mastering process of mastering by 2 workers as many as 65 pieces of fabric per day. On the 31st and 32nd days, carried out the tailoring process by 60 workers as many as 60 sheets, the soaking process with 2 workers as many as 65 pieces of fabric, and the process of coloring pestilence by drying by 3 workers as many as 65 pieces of fabric. On the 34th day carried out the soaking process by 2 workers as many as 60 pieces of fabric and the coloring process until drying by 3 workers as many as 65 pieces of fabric. On the 35th day only carried out the process of mastering by 2 workers as many as 60 pieces of fabric.
2 . Sunflower Motif: From day 29th to day 35th, the tailoring process was carried out by 5 workers as many as 5 pieces of fabric per day in the first 3 days and carried out by 65 workers as many as 65 sheets of fabric on the next 4 days. On the 32nd and 3rd days, carried out the rope binding process by 4 workers as many as 4 pieces of fabric on the first day and carried out by 5 workers as many as 5 pieces of fabric on the next day. Furthermore, on the 35th day, a tailoring process was carried out by 65 workers with as many as 65 pieces of fabric, and the soaking process by 1 worker with as many as 5 pieces of fabric.

Table 11.

Order	Day 36	Day 37	Day 38	Day 39	Day 40	Day 41	Day 42
Sasirangan							
Pattern	F : 2(60)	G : 3(60)					
Sunflowers	C : 65(65)	C : 65(65) F : 1(5)	C : 65(65) D : 65(65) F : 1(5)	C : 65(65) D : 65(65) G : 1(5)	C : 65(65) D : 65(65)	C : 65(65) E : 2(65)	C : 65(65) F : 2(65)
Sow Flowers							
Point 9							
Point 7							

Based on the data in the week 5 table above, it can be seen that:

1. Pattern Motif: On the 36th day, a mastery process was carried out by 2 workers for as many as 60 sheets and continued on the 37th day from the coloring process to the drying by 3 workers for as many as 60 sheets. All pattern motif orders are completed on the 37th day
2. Sunflower Motif: From the 36th to the 42nd day, a suturing process was carried out by 65 workers as many as 65 pieces of fabric per day. Furthermore, on the 37th day, the process of mastering by 1 worker with as many as 5 pieces of fabric was carried out. On the 38th day carried out the rope binding process by 65 workers with as many as 65 pieces of fabric and the process of mastering by 1 worker with as many as 5 pieces of fabric. On the 39th day, carried out the rope binding process by 65 workers with as many as 65 pieces of fabric and the coloring process up to drying by 1 worker with as many as 5 pieces of fabric. On the 40th day, carried out the rope binding process by 65 workers with as many as 65 pieces of fabric. On the 41st day was carried out the soaking process by 2 workers with as many as 65 pieces of fabric. On the 42nd day, carried out the process of mastering by 2 workers as many as 65 pieces of fabric.

Table 12.

Order	Day 43	Day 44	Day 45	Day 46	Day 47	Day 48	Day 49
Sasirangan							
Pattern							
Sunflowers	C : 65(65) F : 2(65)	C : 65(65) G : 3(65)	C : 15(15) D : 65(65)	D : 65(65)	D : 65(65)	D : 15(15) E : 2(65)	D : 15(15) F : 2(65)
Sow Flowers			C : 50(50)	C : 65(65)	C : 20(20)	D : 50(50)	D : 50(50)
Point 9					C : 45(45)	C : 50(50)	C : 50(50)
Point 7						C : 15(15)	C : 15(15)

Based on the data in the week 7 table above, it can be seen that:

1. Sunflower Motif: On the 43rd day, a tailoring process was carried out by 65 workers with as many as 65 pieces of fabric and the process of mastering by 2 workers as many as 65 pieces of fabric. On the 44th day carried out the tailoring process by 65 workers as many as 65 pieces of fabric and the coloring process up to drying by 3 workers as many as 65 pieces of fabric. On the 45th day, carried out the tailoring process by 15 workers with as many as 15 pieces of fabric and the rope binding process by 65 workers with as many as 65 pieces of fabric. On the 46th day, carried out the rope binding process by 65 workers with as many as 65 pieces of fabric. On The 48th day, carried out the rope binding process by 15 workers with as many as 15 pieces of fabric and the soaking process by 2 workers with as many as 65 pieces of fabric. On the 49th day, carried out the rope binding process by 15 workers with as many as 15 pieces of fabric and the process of mastering by 2 workers with as many as 65 pieces of fabric.
2. Sow Flower Motif: On the 45th day, the tailoring process was carried out by 50 workers with as many as 50 pieces of fabric. On the 46th day was carried out the tailoring process by 65 workers with as many as 65 pieces of fabric. On the 47th day was carried out the tailoring process by 20 workers with as many as 20 pieces of fabric. On the 48th and 49th days, carried out the rope binding process by 50 workers with as many as 50 pieces of fabric.
3. Motif Point 9: On the 47th day was carried out the tailoring process by 45 workers with as many as 45 pieces of fabric. On the 48th and 49th days carried out the tailoring process by 50 workers as many as 50 pieces of fabric per day.

Table 13.

Order	**Day 50**	**Day 51**	**Day 52**	**Day 53**	**Day 54**	**Day 55**	**Day 56**
Sasirangan							
Pattern							
Sunflowers	E : 1(15) F : 2(65)	F : 1(15) G : 3(65)	F : 1(15)	G : 1(15)			
Sow Flowers	D : 65(65) E : 1(50)	D : 65(65) F : 1(50)	D : 20(20) E : 2(65) F : 1(50)	D : 20(20) F : 2(65) G : 2(50)	E : 1(20) F : 2(65)	F : 1(20) G : 3(65)	F : 1(20)
Point 9	C : 50(50)	C : 50(50)	C : 50(50)	C : 50(50)	C : 50(50)	C : 50(50)	C : 50(50)
Point 7	C : 15(15)	C : 15(15)	C : 15(15)	C : 15(15)	C : 15(15)	C : 15(15)	C : 15(15)

Based on the data in the 8th-week table above, it can be seen that:

1. Sunflower Motif: On the 50th day, the soaking process was carried out by 1 worker for as many as 15 pieces of fabric, and the process of mastering by 2 workers for as many as 65 pieces of fabric. On the 51st day carried out the mastery process by 1 worker with as many as 15 pieces of fabric and the coloring process up to drying by 3 workers with as many as 65 pieces of fabric. On the 52nd day, carried out the process of mastering by 1 worker as many as 15 pieces of fabric. On the 53rd day, the coloring process was carried out up to the drying by 1 worker on as many as 15 pieces of fabric. All orders for sunflower motifs were completed on the 53rd day.

2. Sow Flower Motif: On the 50th day, a rope binding process was carried out by 65 workers with as many as 65 pieces of fabric and the soaking process by 1 worker with as many as 50 pieces of fabric. On the 51st day, carried out the rope binding process by 65 workers with as many as 65 pieces of fabric and the process of mastering by 1 worker with as many as 50 pieces of fabric. On the 52nd day, carried out the rope binding process by 20 workers with as many as 20 pieces of fabric, the soaking process by 2 workers with as many as 65 pieces of fabric, and the process of mastering by 1 worker with as many as 50 sheets fabric. On the 53rd day, carried out the rope binding process by 20 workers with as many as 20 pieces of fabric, the soaking process by 2 workers with as many as 65 pieces of fabric, and the coloring process up to drying by 2 workers with as many as 50 pieces of fabric. On the 54th day, carried out the soaking process by 1 worker with as many as 20 pieces of fabric and the mastering process by 2 workers with as many as 65 pieces of fabric. On the 55thday carried out the mastery process by 1 worker with as many as 20 pieces of fabric and the coloring process up to drying by 3 workers with as many as 65 pieces of fabric. On the 56th day, carried out the process of mastering by 1 worker with as many as 20 pieces of fabric.
3. Motif Point 9: From day 50 to day 56, the tailoring process was carried out by 50 workers with as many as 50 pieces of fabric per day.
4. Motif Point 7: From Day 50 to day 56, the tailoring process was carried out by 15 workers with as many as 15 pieces of fabric per day.

Table 14.

Order	**Day 57**	**Day 58**	**Day 59**	**Day 60**	**Day 61**	**Day 62**	**Day 63**
Sasirangan							
Pattern							
Sunflowers							
Sow Flowers	G : 1(20)						
Point 9	C : 50(50)	C : 50(50)	C : 50(50)	C : 50(50)	C : 50(50)	D : 50(50)	D : 50(50)
Point 7	C : 15(15)	C : 15(15)	C : 15(15)	C : 15(15)	C : 15(15)	C : 35(35) D : 15(15)	C : 35(35) D : 15(15)

Based on the data in the week 9 table above, it can be seen that:

1. Sow Flower Motif: On the 57th day, the coloring process was carried out up to drying by 1 worker with as many as 20 pieces of fabric. All orders of sow flower motifs are completed on the 57th day
2. Motif Point 9: From day 57 to day 61, a tailoring process was carried out by 50 workers with as many as 50 pieces of fabric, and the rope binding process was carried out by 50 workers with as many as 50 pieces of fabric on the day 62nd and 63rd.
3. Motif Point 7: From day 57 to day 61, the tailoring process was carried out by 15 workers with as many as 15 pieces of fabric and 35 workers with as many as 35 pieces of fabric on the 62nd and 63rd days. On the 62nd and 63rd days, there was also a rope binding process by 15 workers with as many as 15 pieces of fabric.

Table 15.

Order	Day 64	Day 65	Day 66	Day 67	Day 68	Day 69	Day 70
Sasirangan							
Pattern							
Sunflowers							
Sow Flowers							
Point 9	D : 50(50)	D : 50(50)	D : 50(50)	D : 50(50)	D : 50(50)	E : 1(50)	F : 1(50)
Point 7	C : 35(35) D : 15(15)	C : 35(35) D : 15(15)	C : 35(35) D : 15(15)	C : 35(35) D : 15(15)	C : 35(35) D : 15(15)	C : 35(35) E : 1(15)	C : 35(35) F : 1(15)

Based on the data in the 10th-week table above, it can be seen that:

1. Motif Point 9: From day 64 to day 68, a rope binding process was carried out by 50 workers with as many as 50 pieces of fabric and 1 worker with as many as 50 pieces of fabric on the 69th day and day 70th.
2. Motif Point 7: From the 64th day to the 68th day was carried out the tailoring process by 35 workers with as many as 35 pieces of fabric and the rope binding process by 15 workers with as many as 15 pieces of fabric. From the 69th to the 70th day was also carried out the tailoring process by 35 workers with as many as 35 pieces of fabric, and the rope binding process by 1 worker for as many as 15 pieces of fabric.

Table 16.

Order	Day 71	Day 72	Day 73	Day 74	Day 75	Day 76	Day 77
Sasirangan							
Pattern							
Sunflowers							
Sow Flowers							
Point 9	F : 1(50)	G : 2(50)					
Point 7	C : 35(35) F : 1(15)	C : 35(35) G : 1(15)	C : 35(35)	C : 35(35)	C : 35(35)	D : 35(35)	D : 35(35)

Based on the data in the 11th-week table above, it can be seen that:

1. Motif Point 9: On the 71st day, carried out the process of mastering by 1 worker as many as 50 pieces of fabric. On the 72nd day, carried out the coloring process up to the drying by 2 workers of as many as 50 pieces of fabric. All orders of the 9th point motif were completed by the 72nd day
2. Motif Point 7: On the 71st day, the tailoring process was carried out by 35 workers with as many as 35 pieces of fabric until the 75th day. On the 71st day also carried out the process of mastering by 1 worker as many as 15 pieces of fabric. On the 72nd day, carried out the coloring process up to the drying by 1 worker as many as 15 pieces of fabric. On the 76th and 77th days, carried out the rope binding process by 35 workers with as many as 35 pieces of fabric.

Table 17.

Order	Day 78	Day 79	Day 80	Day 81	Day 82	Day 83	Day 84
Sasirangan							
Pattern							
Sunflowers							
Sow Flowers							
Point 9							
Point 7	D : 35(35)	D : 35(35)	D : 35(35)	D : 35(35)	D : 35(35)	E : 1(35)	F : 1(35)

Based on the data in the 12th-week table above, it can be seen that:

1. Motif point 7: From day 78 to day 82, a rope binding process was carried out by 35 workers with as many as 35 pieces of fabric. From day 83 to day 84, the soaking process was carried out by 1 worker for as many as 35 pieces of fabric.

Table 18.

Order	Day 85	Day 86	Day 87
Sasirangan			
Pattern			
Sunflowers			
Sow Flowers			
Point 9			
Point 7	F : 1(35)	G : 2(35)	

Based on the data in the 13th-week table above, it can be seen that:

1 . Motif Point 7: On the day 85th, the process of mastering by 1 worker as many as 35 pieces of fabric was carried out and on the 86th day the coloring process was carried out up to drying by 2 workers as many as 35 pieces of fabric. All orders for the point 7 motifs were completed on the 86th day.

Table 19.

NO	Types of Motifs Ordered	Order Quantity	Deadline	End Time
1	Point 9	50 sheets	90 days	72 days
2	Point 7	50 sheets	90 days	84 days
3	Sunflowers	150 sheets	60 days	51 days
4	Sasirangan	100 sheets	50 days	28 days
5	Pattern	250 sheets	55 days	37 days

IV. Conclusion

Based on the results of data processing, it was concluded that assuming fabric orders measuring 3 x 1.5m per sheet as many as 6 types of fabric motifs that have their respective order quantities, namely point motifs 9 as many as 50 pieces of fabric, point 7 motifs as many as 50 pieces of fabric, sunflower motifs as many as 150 pieces of fabric, sasirangan motif as many as100 pieces of fabric, pattern motifs as many as 250 pieces of fabric, and 135 pieces of sow flower motifs. The process of work starts from the sasirangan motif first then the pattern motif, sunflowers, sow flowers, point 7 and finally point 9. Sasirangan motif with an order amount of 100 pieces of fabric is done first and can be completed for 28 days. Pattern motifs as many as 250 pieces of fabric can be completed in 37 days. Furthermore, the sunflower motif with an order amount of 150 sheets can be completed in 51 days. Then, the sow flower motif with an order amount of 135 sheets can be completed in 57 days. Finally, the 9-point motif with an order amount of 50 sheets can be completed in 72 days.

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