A DECISION SUPPORT SYSTEM APPROACH TO LOT-SIZING PROBLEM IN MATERIAL REQUIREMENTS PLANNING PROCESS

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ABSTRACT

Material Requirements Planning (MRP) is a system that has inputs like master production scheduling, product tree, inventory status information and outputs like planning reports of order precedence, performance control reports, and lead time. Decision Support Systems (DSS) is a flexible information technology system that is designed to help the decision making system in case the decision isn't structural. This study is made for the purpose of resolving the lot-sizing problem in MRP process by using a DSS approach in flour milling system manufacturer firm. Thus, a DSS is developed in Visual Basic 6.0 and using the developed DSS, techniques that determine order quantities and makes cost analysis are researched and these techniques are implemented in the firm. After monthly demand quantities are inserted, the DSS is run, the optimal lot-sizing method that minimises the cost is found as the feasible method.

Keywords: Material Requirements Planning, Lot-Sizing, Decision Support Systems, Flour Milling Systems Manufacturing

MALZEME İHTİYAÇ PLANLAMA SÜRECİNDE PARTİ HACİMLENDİRME PROBLEMİNE BİR KARAR DESTEK SİSTEMİ YAKLAŞIMI

ÖZET

Malzeme İhtiyaç Planlama (MİP) ana üretim planı, ürün ağacı, stok durum bilgileri gibi verileri kullanarak işleri önceliklerine göre sıralayan üretim planlama raporları, performans kontrol raporları ve iş teslim süreleri gibi çıktılar üreten bir sistemdir. Karar Destek Sistemleri (KDS) ise yapısal olmayan karar durumlarında karar verme sürecine yardımcı olmak için geliştirilen esnek bilişim teknolojileridir. Bu çalışmada, değirmen makineleri imal eden bir firmada KDS yaklaşımı kullanarak MİP sürecinde parti hacimlendirme problemine çözüm aranmıştır. Bu amaçla, Visual Basic 6.0 kullanılarak bir KDS geliştirilmiştir. Geliştirilen KDS yazılımının değirmen makineleri imal eden firmada uygulanması neticesinde optimal parti hacimlendirme tekniği "periyodik sipariş miktarı yöntemi" olarak bulunmuştur.

Anahtar Kelimeler: Malzeme İhtiyaç Planlama, Parti-Hacimlendirme, Karar Destek Sistemi, Değirmen Makineleri İmalatı.

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INTRODUCTION

The purpose of this study is to handle the lot-sizing problem in Material Requirements Planning (MRP) process by using order determining techniques and resolving by a decision support system approach in a manufacturing firm that produces millers thereby to determine the optimum technique for cost.

This study includes the inputs-outputs, benefits-drawbacks of the MRP system, the properties of the decision support systems, ten order quantity determining techniques and the resolving implementation of the lot-sizing problem in MRP process by using a decision support system in a firm that produces millers. At the final of the study, order quantity determining technique that is with the minimum cost to the firm would be found and how often and in what quantity the order would be determined.

The aim of the MRP is to produce data for an effective inventory management by determining gross and net requirements at all the inventory units. Inventories and materials that planned and controlled by MRP would be reached to the facility whenever it is desired to make the planned manufacturing and forwarding. The minimum inventory would be in the system for the reason that materials exist in the company at the right time. In addition, by this system lead plans are improved both for production and purchasing, and according to the freshest data about attainability of materials and delivery times; the precedence for the review functions would be determined. By looking to the planned orders, the capacity planning can be made (Acar, 1999; Üreten, 1988). MRP is an effective inventory control system for those reasons;

- Inventory invests are held up at the least level,
- The MRP system is flexible to the changes,
- The system, presents a point of view to the future for inventory units,
- Order quantities are determined according to demands,
- The MRP system takes care of demand timing and to be satisfied completely (Acar, 1999).

The purpose of the MRP are to provide manufacturing and forwarding of the planned product in time, to make scheduling and control and to manage the capacity plan according to the data about when and which part would be purchased, attainability of the part, delivery dates. Briefly, MRP is a strong inventory/manufacturing control, purchasing/forwarding planning system (Çelikçapa ve Sarsılmaz, 1999). In MRP, the purposes of the system are arranged like below;

1- To provide materials arriving to the facility in time in order to achieve the planned and controlled inventories; planned manufacture and forwarding,

2- Holding up the minimum inventory at the system by providing materials to be ready in time,

3- Planning of the production, forwarding and purchasing activities, constituting lead plans for production and purchasing; updating of these, scheduling and controlling functions based upon actual data.

4- By orientating the planned orders, composing of the capacity plan.

5- By determining gross and net requirements at the inventory units, constituting data for a real inventory management (Çetinkaya, 1988).

1. LITERATURE REVIEW

MRP firstly arose as a computer-based approach in material supply and production at the beginning of 1960s in USA. A book completes his technique had been issued by Orlicky in 1975. There are some enrolment towards this technique was used somewhere in Europe without the computer. However Orlicky noticed that this technique provided detailed implementations at managing the manufacturing inventories by computer using (Yegül, 2002). The effective using of the computer about MRP was made by Plossl and Wight in 1967. They redefined something those very important at the target of MRP: i. productive (less costly) operations, ii. maximum customer satisfaction, and iii. minimum inventory investment targets.

The popularity of the MRP increased at the beginning of 1970s with the related encouraging studies of the American Production and Inventory Control Society (APICS). APICS, tried to convince people that there was a solution at the management of all production process as an integrated communication and a decision support system. The necessity of the system analysis and the management science for optimising the technique was emphasised. As the most important problems that are discipline, education, comprehension and communication were shown, this encouragement was sustained by the computer industry (Yegül, 2002).

Material requirements planning (MRP) is a computerized information system for managing dependent demand inventory and scheduling stock replenishment orders. The subject of the MRP is generally obtaining the right part, at the right quantity and on the right time (Ho et al., 2007). MRP systems become an important approach to manage the flow of the raw material and components, in production facility at the last of 20th century. The main focus point of the MRP is to provide an effective inventory management for the dependent demand parts. The purposes of MRP systems are producing the right inventory data to determine the right order quantity on the right time.

Enns (1999) evaluates fixed batch size settings under MRP assumptions with batch processing and assembly. Author uses a spreadsheet-based MRP package for weekly production planning and shows that batch size settings and utilization have effects on inventory and delivery performance.

Lyu et al. (2001) develops a parallel dynamic lot-sizing model algorithm to solve the lot-sizing problem. They provide numerical experiments to verify the complexity of the proposed algorithm. They prove that the speedup of this parallel algorithm approaches linearity, which means that the proposed algorithm can take full advantage of the distributed computing power as the size of the problem increases.

Dellaert and Jeunet (2003) consider the multi-level lot-sizing (MLLS) problem as it occurs in material requirements planning systems, with no capacity constraints and a time-invariant cost structure. They develop randomized versions of the popular Wagner–Whitin algorithm and the Silver–Meal technique which can easily handle product structures with numerous common parts. They test the effectiveness of the proposed algorithms through a series of simulation experiments reproducing common industrial settings.

Jeunet ve Jonard (2005) examine the performance of single point stochastic techniques and compare them to several problem specific algorithms for the multi-level lot-sizing (MLLS) problem. They find that these techniques, despite of their simplicity and the widespread belief that they are generally efficient, only seldom outperform problem-specific algorithms, and when they do, so it is usually associated with a much longer execution time. They also exhibit an efficient combination of search and annealing which is found in order to produce significant and consistent improvements over problem-specific algorithms.

Ho et al. (2007) recently proposed, for the single-level incapacitated case, two LPC-based lot-sizing heuristics known as net Least Period Cost, or nLPC, and an *improved* version of nLPC, called nLPC(i). While the average period cost (*APC*) concept applied in the LPC algorithm involves dividing the total cost by the number of periods in the planning horizon, the nLPC heuristic is based on a *net* average period cost (*NAPC*) which is the ratio of total cost to the number of non-zero demand periods. The use of *NAPC* leads to lengthening the order coverage or reducing the total number of orders in the planning horizon, thereby improving cost performance under scenarios where zero demand occurs. Ho et al. (2007) performed a simulation study to compare their heuristics with seven existing heuristics, including LPC, and concluded that both yielded superior and robust performance under a wide range of experimental conditions.

2. RESEARCH AND RESULTS

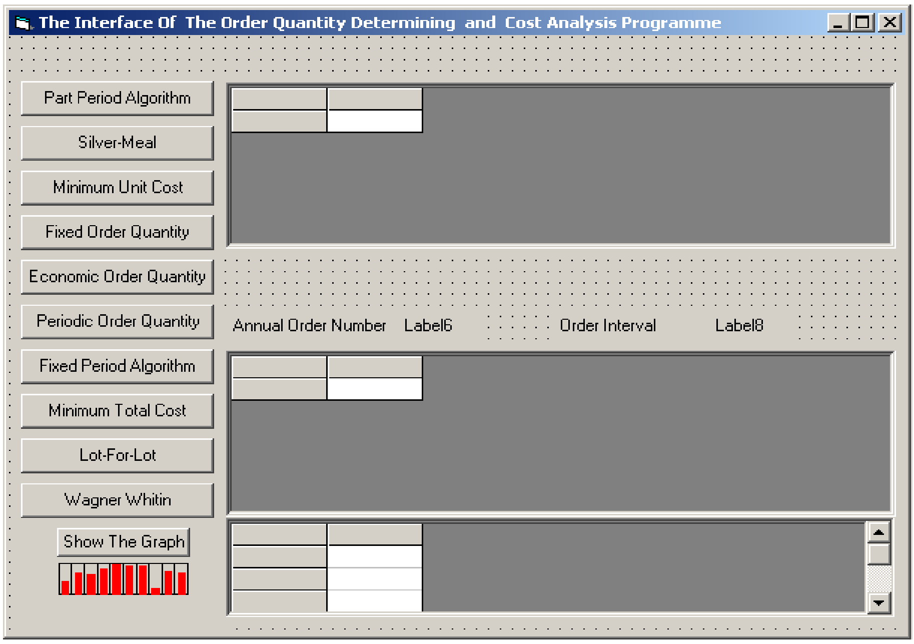
The implementation section of this study is carried out in flour milling systems manufacturer firm in Konya. Microsoft Visual Studio 6.0 is used as a decision support system in formulations at the solution process of algorithms. As hardware, a computer is used that has Intel Pentium II Processor, 350 MHz, 192 MB RAM property and Windows XP Professional, Version 2002, Service Pack 2 system.

2.1. The Order Quantity and Total Cost Computation for the Waltz Machine

2.1.1. The Interface of the Developed Decision Support System

Decision support systems are flexible and interactive information technology systems that are designed for helping to take a decision when the decision isn't structural (Haag et al., 1998). These don't displace to the decider instead of supporting his/her decisions and these are interactive systems that help decider for the solution of problems that are semi-structural and non-structural (Keen and Norton, 1982).

Table 1. The interface of the order quantity determining and cost analysis programme



This software functions as a decision support system that helps user to decide on the lot-sizing and cost computation of every technique, after running the Visual Basic programme given above when the prepared interface net requirements are entered.

2.1.2. Fixed Order Quantity Method

After running the software programme when monthly net requirements are entered by "Fixed Order Quantity Method" situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 2.

Table 2. Results with the Fixed Order Quantity method

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1500		1500		1500		1500		1500		1500		9000
Inventory Holding Cost	0	725	250	1025	375	1300	575	1300	500	1175	325	1000	8550
Setup Cost	1500		1500		1500		1500		1500		1500		9000
Total Cost													17550

2.1.3. Lot-For-Lot Method

After running the software programme when monthly net requirements are entered by "Lot-For-Lot Method" situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 3.

Table 3. Results with the Lot-For-Lot method

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	475	725	650	575	725	775	800	825	850	825	750		8750
Inventory Holding Cost	0	0	0	0	0	0	0	0	0	0	0	0	0
Setup Cost	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	18000
Total Cost													18000

2.1.4. Economic Order Quantity Method

Setup Cost (S): 1500 money unit

Inventory Holding Cost (I): 49,2 (annual) money unit

Annual Usage Quantity (U): 8750

$$EQQ = \sqrt{(2*U*S)/(I)} = \sqrt{(2*8720*1500)/(49{,}2)} = 730$$

After running the software programme when monthly net requirements are entered by “Economic Order Quantity Method” situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 4.

Table 4. The programme output with the Economic Order Quantity method

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Given Order	775	475	725	650	575	725	775	800	825	850	825	750	8750
Verilen Sipariş	730		730		730		730		730		730		4380
Inventory Holding Cost		725	250	1025	375	1300	575	1300	500	1175	325	1000	8550
Setup Cost	1500		1500		1500		1500		1500		1500		9000
Total Cost													17550

2.1.5. Fixed Period Algorithm Method

After running the software programme when monthly net requirements are entered by “Fixed Period Algorithm Method” situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 5.

Table 5. Results with the Fixed Period Algorithm method

Months	1	2	3	4	5	6	7	8	9	10	11	12	Cost
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1975			1950			2400			2425			8750
Inventory Holding Cost	0	1200	725	0	1300	725	0	1625	825	0	1575	750	8725
Setup Cost	1500			1500			1500			1500			6000
Total Cost													14725

2.1.6. Periodic Order Quantity Method

It was found as EQQ = 730 in the economic order quantity example.

Annual period number = 12

Annual demand = 8750

8750/730 ≈ 6 (Annual order number)

12/6 = 2 (Order interval)

After running the software programme when monthly net requirements are entered by "Periodic Order Quantity Method" situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 6.

Table 6. Results with the Periodic Order Quantity method

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1250		1375		1300		1575		1675		1575		8750
Inventory Holding Cost	0	475	0	650	0	725	0	800	0	850	0	750	4250
Setup Cost	1500		1500		1500		1500		1500		1500		9000
Total Cost													13250

Annual Order Number 6 Order Interval 2

2.1.7. Minimum Unit Cost Method

After running the software programme when monthly net requirements are entered by "Minimum Unit Cost Method" situated results (the period number that has been held in inventory, the probable order quantity, the unit setup cost) are shown in Table 7 and the order table (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) is shown in Table 8.

Table 7. Results with the Minimum Unit Cost method

Period	Net Req.	Per. Held In Inv.	Prob. Ord. Quant.(1)	Holding For Lot(2)	Cost For Unit(2/1)	Unit Setup Cost(S/1)	Unit Cost
1	775	0	775	0	0	1,94	1
2	475	1	1250	475	0,38	1,2	1
3	725	2	1975	1450	0,73	0,76	0
1	725	0	725	0	0	2,07	2
2	650	1	1375	650	0,47	1,09	1
3	575	2	1950	1150	0,59	0,77	0
1	575	0	575	0	0	2,61	2
2	725	1	1300	725	0,56	1,15	1
3	775	2	2075	1550	0,75	0,72	0
4	800	3	2875		0	0,52	0
1	800	0	800	2400	3	1,88	4
2	825	1	1625	825	0,51	0,92	0
3	850	2	2475	1700	0,69	0,61	0
1	850	0	850	0	0	1,76	1
2	825	1	1675	825	0,49	0,9	0
3	750	2	2425	1500	0,62	0,62	0
1	750	0	750	0	0	2	2

Table 8. The order table of minimum unit cost

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	
Given Order	1250		1375		2075			1625		1675		750	8750
Inventory Holding Cost		475	0	650	0	1500	775	0	825	0	825	0	5050
Setup Cost	1500		1500		1500			1500		1500		1500	9000
Total Cost													14050

2.1.8. Minimum Total Cost Method

EPP = Minimum Total Cost

S = Setup Cost = 1500 money unit

Ip = Periodic Inventory Holding Cost = 49,2/12 = 4,1 unit

C = Unit Cost = 1 money unit

EPP = S/(Ip*C) = 1500/(4,1 *1) ≈ 366

Table 9. The order table of minimum unit cost

Period	Net Requirement	Period Num. Held In Inv.	Probable Lot Quantity	Part-Period
1	775	0	775	0
2	475	1	1250	475
3	725	2	1975	1925
4	650	3	2625	3875
1	650	0	650	0
2	575	1	1225	575
3	725	2	1950	1450
1	725	0	725	0
2	775	1	1500	775
3	800	2	2300	1600
1	800	0	800	0
2	825	1	1625	825
3	850	2	2475	1700
1	850	0	850	0
2	825	1	1675	825
3	750	2	2425	2325
1	750	0	750	0

It has been chosen as order quantity that is the nearest to 366 (EPP) of found values from "probable order quantity" column in Table 9. After running the software programme when monthly net requirements are entered by "Minimum Total Cost Method" situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 10.

Table 10. The order table of minimum total cost

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1975			1225		1500		1625		1675		750	8750
Inventory Holding Cost		1200	725	0	575	0	775	0	825	0	825	0	4925
Setup Cost	1500			1500		1500		1500		1500		1500	9000
Total Cost													13925

2.1.9. The Part Period Algorithm

In Table 11 the order quantities that should be given in some months with the part period algorithm, have been shown. The costing computation with this algorithm (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) has been shown in Table 12.

Table 11. The order quantities with the part period algorithm

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Part-Period	0	1	2	3	1	2	1	2	1	2	1	2	
		475	725	650	575	725	775	800	825	850	825	750	
Part-Period(cumulative)	0	475	1925	3875	575	2025	575	2175	575	1700	575	1500	
Order Quantity	1975			1225		1500		1625		1675		750	8750

Table 12. The costing computation with the part period algorithm

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1975			1225		1500		1625		1675		750	8750
Inventory Holding Cost	0	1200	725	0	575	0	775	0	825	0	825	0	4925
Setup Cost	1500			1500		1500		1500		1500		1500	9000
Total Cost													13925

2.1.10. The Silver-Meal Heuristic Algorithm

Silver and Meal (1973) proposed a heuristic, commonly known as least period cost (LPC), to minimize the average cost of setup and holding per period. After running the software programme when monthly net requirements are entered by "The Silver-Meal Heuristic Algorithm" situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 13.

Table 13. The order quantity and costing computation with the Silver-Meal method

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1250		725	1225		725	775	800	825	850	825	750	8750
Inventory Holding Cost	0	475	0	1500	575	0	0	0	0	0	0	0	2550
Setup Cost	0		1500	1500		1500	1500	1500	1500	1500	1500	1500	13500
Total Cost													16050

2.1.11. The Wagner-Whitin Algorithm

For the single-level incapacitated lot-sizing problem, Wagner and Whitin (1958) introduced a dynamic programming procedure to optimally solve the time varying demand case. Nevertheless, the Wagner–Whitin (WW) algorithm has not been significantly applied in practice because it is somewhat mathematically complex particularly for practitioners. After running the software programme when monthly net requirements are entered by "The Wagner-Whitin Algorithm" situated results (the order quantity, the inventory holding cost, the setup cost and the total cost for every month) are shown in Table 14; the determining of orders and inventory costs are shown in Table 15.

Tablo 14. Results with the Wagner-Whitin algorithm

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Net Requirement	775	475	725	650	575	725	775	800	825	850	825	750	8750
Given Order	1975			1950			4825						8750
Inventory Holding Cost		1200	725	0	1300	725	0	4050	3250	2425	1575	750	16000
Setup Cost	1500			1500			1500						4500
Total Cost													20500

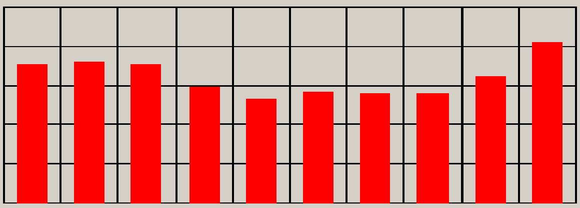
2.2. Comparing of the MRP Order Computation

In the graph at the Figure 1, total cost values calculated above and for each lot-sizing technique values at the above table have been respectively shown under columns in the graph; as a result the technique of all that gives the minimum total cost, the fifth column in the graph from the beginning "periodic order quantity method" has been determined.

Table 15. Determining of orders and inventory costs with the Wagner-Whitin algorithm

Months	1	2	3	4	5	6	7	8	9	10	11	12
Demand	775	475	725	650	575	725	775	800	825	850	825	750
Order Cost of Service	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Inventory Holding Cost	1	1	1	1	1	1	1	1	1	1	1	1
Period Held in Inventory	0	1	2	3	4	5	6	7	8	9	10	11
	1500	475	1450	1950	2300	3625	4650	5600	6600	7650	8250	8250
		1500	725	1300	1725	2900	3875	4800	5775	6800	7425	7500
			1500	650	1150	2175	3100	4000	4950	5950	6600	6750
				1500	575	1450	2325	3200	4125	5100	5775	6000
					1500	725	1550	2400	3300	4250	4950	5250
						1500	775	1600	2475	3400	4125	4500
							1500	800	1650	2550	3300	3750
								1500	825	1700	2475	3000
									1500	850	1650	2250
										1500	825	1500
											1500	750
												1500
Months	1	2	3	4	5	6	7	8	9	10	11	12
	1500	1975	3425	5375	7675	11300	15950	21550	28150	35800	44050	52300
		1500	2225	3525	5250	8150	12025	16825	22600	29400	36825	44325
			1500	2150	3300	5475	8575	12575	17525	23475	30075	36825
				1500	2075	3525	5850	9050	13175	18275	24050	30050
					1500	2225	3775	6175	9475	13725	18675	23925
						1500	2275	3875	6350	9750	13875	18375
							1500	2300	3950	6500	9800	13550
								1500	2325	4025	6500	9500
									1500	2350	4000	6250
										1500	2325	3825
											1500	2250
												1500
Months	1	2	3	4	5	6	7	8	9	10	11	12
	1500	1975	3425	5375	7675	11300	15950	21550	28150	35800	44050	52300
		3000	3725	5025	6750	9650	13525	18325	24100	30900	38325	45825
			3475	4125	5275	7450	10550	14550	19500	25450	32050	38800
				4925	5500	6950	9275	12475	16600	21700	27475	33475
					6875	7600	9150	11550	14850	19100	24050	29300
						9175	9950	11550	14025	17425	21550	26050
							12800	13600	15250	17800	21100	24850
								17450	18275	19975	22450	25450
									23050	23900	25550	27800
										29650	30475	31975
											37300	38050
												45550

Figure 1. Comparing of the order quantity determining techniques



Method	Total Cost
Fixed Order Quantity	17550
Lot-For-Lot	18000
Ekonomic Order Quantity	17550
Fixed Period Algorithm	14725
Periodic Order Quantity	13250
Minimum Unit Cost	14050
Minimum Total Cost	13925
Part Period Algorithm	13925
Silver-Meal	16050
Wagner-Whitin	20500

Here as a result, from finding "periodic order quantity method" an economic time interval has been calculated then lot-sizes which is defined economic order quantity divided by average demand ratio have been obtained. In this method, beginning from the first period, the order of the next period included itself, is given together. But when an order is given at a period, the next period no order is given.

CONCLUSIONS

Two factors are important to execute MRP successfully. First of all, supply resources should perform reliable and punctual. Minimum problems in supply may cause all the production system to fail because delaying tolerances are too little. The second factor is the big data processing capacity necessary for the material requirement planning. For that, MRP programme should absolutely be implemented with the computer support. For this reason, at the implementation section of the study, a completely new programme has been programmed; the order quantity determining and costing analysis has been done on that software then it has been reported.

If the lot-sizes are taken too little, it would need setups frequently and machines would be used at high rates. This will cause long waiting times. But if the lot-sizes are taken too much, machines would operate the some part in more time. This causes to problems at managing part quantities and generally to high inventories. That the order releasing time would be necessary consistent with the completion time of the components shouldn't be forgotten to do performance the best. The heuristic method that has the minimum inventory and the best delaying time when it was implemented in the lot-sizing problem in the material requirement process, should be chosen.

In the economic lot-sizing problem at the study, it is an important point that the heuristic method sometimes takes the production facility idle not to cause extreme inventory. Remains to the future studies are when the lot-sizes would be computed and how it would be adapted with the actual beginning inventory.

When the lot-sizing techniques analysed; it is seen that the incapacitated techniques at the high demand levels (Lot-for-lot, Fixed period algorithm, Minimum unit cost and Silver-meal) dispelled the total inventory at the comparable size. If the demand is low, total inventory costs of all lot-sizing techniques reaches to the lot-for-lot's. For this reason, the lot-for-lot technique for its mathematical simplicity is generally preferred.

In the study that implemented in a flour milling systems manufacturer firm, with 10 lot-sizing technique by considering the demands of Waltz Machine, ordering quantities were found monthly and total costs were calculated. At Figure 1, this result was compared and as shown in the figure "periodic order quantity" was chosen as the most feasible method and it is suggested the flour milling systems manufacturer firm to implement this method when determining the order quantity at the Waltz Machine supply process.

Material requirement planning system also reaches to the result by data presented to itself like the computer software used as an object. Therefore accuracy and sufficiency of data becomes the most important factor for the system. So the management should be instructed about the system and they should support the system. While determining the order quantity in the MRP process, at choosing the technique with the minimum cost, a decision support system that provides user to decide quick has been improved and this decision support system not only in the flour milling systems manufacturer firm which was the implementation done, but also in suchlike that companies would be used. Remaining to the next researches are when the lot-sizes will be calculated frequently and how it will be adapted with the existing beginning inventory.

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