CHAPTER 4

RESULTS AND DISCUSSION

4.2 Spreadsheet MRP model for Panel Front Door Left Hand Side Assembly

	A	B	C	D	E	F	G	H	I	J
1										
2	**MRP Model Analysis**									
3										
4	**Bill of materials**									
5										
6	**Item name**	**Level**	**Number of part**							
7	Panel Front Door LH Assy	0	1	1						
8	Panel Front Door Inr LH Assy	1	1	2						
9	Panel Front Door LH Otr	1	1	3						
10	Bar Assy Fr Dr Side Impact	2	1	4						
11	Bar Assy Fr Dr Belt Line Inr Impact	2	1	5						
12	Bracket Fr Dr Fr S/Impact LH	3	1	6						
13	Bar Fr Dr Side Impact LH	3	1	7						
14	Brkt Fr Dr Rr S/Impact LH	3	1	8						
15	Bar Fr Dr Belt Line Inr LH	3	1	9						
16	Brkt Fr Dr Fr Beltline Inr LH	3	1	10						
17	Brkt Fr Dr Ctr B/Line LH	3	1	11						
18	Brkt Fr Dr Rr Beltline Inr LH	3	1	12						
19										
20	**Simulation Trials**									
21	Panel Front Door LH Assy - 1		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0
22		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
23	Gross requirements							0		500
24	Scheduled receipts	10	0	0	0	0	0	0	0	0
25	On hand inventory	50	60	60	60	60	60	60	60	60
26	Net requirements		0	0	0	0	0	0	0	440
27	Planned receipts		0	0	0	0	0	0	0	440
28	Planned orders		0	0	0	0	0	0	440	0

30	Panel Front Door Inr LH Assy - 11		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0	
31		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	
32	Gross requirements			0	0	0	0	0	0	440	0
33	Scheduled receipts		30								
34	On hand inventory			30	30	30	30	30	30	30	0
35	Net requirements			0	0	0	0	0	0	410	0
36	Planned receipts			0	0	0	0	0	0	410	0
37	Planned orders			0	0	0	0	0	410	0	0
38											
39	Panel Front Door LH Otr - 12		Lead time:	3	Safety stock:	0	Lot size:	1	Minimum Quantity:	0	
40		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	
41	Gross requirements			0	0	0	0	0	0	440	0
42	Scheduled receipts		20								
43	On hand inventory			20	20	20	20	20	20	20	0
44	Net requirements			0	0	0	0	0	0	420	0
45	Planned receipts			0	0	0	0	0	0	420	0
46	Planned orders			0	0	0	420	0	0	0	0
47											
48	Bar Assy Fr Dr Side Impact - 111		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0	
49		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	
50	Gross requirements			0	0	0	0	0	410	0	0
51	Scheduled receipts										
52	On hand inventory			0	0	0	0	0	0	0	0
53	Net requirements			0	0	0	0	0	410	0	0
54	Planned receipts			0	0	0	0	0	410	0	0
55	Planned orders			0	0	0	0	410	0	0	0

57	Bar Assy Fr Dr Belt Line Inr Impact - 112		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0	
58		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	
59	Gross requirements			0	0	0	0	0	410	0	0
60	Scheduled receipts										
61	On hand inventory			0	0	0	0	0	0	0	0
62	Net requirements			0	0	0	0	0	410	0	0
63	Planned receipts			0	0	0	0	0	410	0	0
64	Planned orders			0	0	0	0	410	0	0	0
65											
66	Bracket Fr Dr Fr S/Impact LH - 1111		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0	
67		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	
68	Gross requirements			0	0	0	0	410	0	0	0
69	Scheduled receipts			0	0	0	0	0	0	0	0
70	On hand inventory			0	0	0	0	0	0	0	0
71	Net requirements			0	0	0	0	410	0	0	0
72	Planned receipts			0	0	0	0	410	0	0	0
73	Planned orders			0	0	0	410	0	0	0	0
74											
75	Bar Fr Dr Side Impact LH - 1112		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0	
76		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	
77	Gross requirements			0	0	0	0	410	0	0	0
78	Scheduled receipts			0	0	0	0	0	0	0	0
79	On hand inventory			0	0	0	0	0	0	0	0
80	Net requirements			0	0	0	0	410	0	0	0
81	Planned receipts			0	0	0	0	410	0	0	0
82	Planned orders			0	0	0	410	0	0	0	0

84	Brkt Fr Dr Rr S/Impact LH - 1113		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0
85		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
86	Gross requirements			0	0	0	0	410	0	0	0
87	Scheduled receipts			0	0	0	0	0	0	0	0
88	On hand inventory			0	0	0	0	0	0	0	0
89	Net requirements			0	0	0	0	410	0	0	0
90	Planned receipts			0	0	0	0	410	0	0	0
91	Planned orders			0	0	0	410	0	0	0	0
92											
93	Bar Fr Dr Belt Line Inr LH - 1121		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0
94		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
95	Gross requirements			0	0	0	0	410	0	0	0
96	Scheduled receipts			0	0	0	0	0	0	0	0
97	On hand inventory			0	0	0	0	0	0	0	0
98	Net requirements			0	0	0	0	410	0	0	0
99	Planned receipts			0	0	0	0	410	0	0	0
100	Planned orders			0	0	0	410	0	0	0	0
101											
102	Brkt Fr Dr Fr Beltline Inr LH - 1122		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0
103		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
104	Gross requirements			0	0	0	0	410	0	0	0
105	Scheduled receipts			0	0	0	0	0	0	0	0
106	On hand inventory			0	0	0	0	0	0	0	0
107	Net requirements			0	0	0	0	410	0	0	0
108	Planned receipts			0	0	0	0	410	0	0	0
109	Planned orders			0	0	0	410	0	0	0	0
111	Brkt Fr Dr Ctr B/Line LH - 1123		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0
112		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
113	Gross requirements			0	0	0	0	410	0	0	0
114	Scheduled receipts			0	0	0	0	0	0	0	0
115	On hand inventory			0	0	0	0	0	0	0	0
116	Net requirements			0	0	0	0	410	0	0	0
117	Planned receipts			0	0	0	0	410	0	0	0
118	Planned orders			0	0	0	410	0	0	0	0
119											
120	Brkt Fr Dr Rr Beltline Inr LH - 1124		Lead time:	1	Safety stock:	0	Lot size:	1	Minimum Quantity:	0
121		Period 0	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
122	Gross requirements			0	0	0	0	410	0	0	0
123	Scheduled receipts			0	0	0	0	0	0	0	0
124	On hand inventory			0	0	0	0	0	0	0	0
125	Net requirements			0	0	0	0	410	0	0	0
126	Planned receipts			0	0	0	0	410	0	0	0
127	Planned orders			0	0	0	410	0	0	0	0

Fig. 4.1: Spreadsheet MRP model for Panel Front Door Left Hand Side Assembly

Figure 4.1 shows the results of spreadsheet MRP model for panel front door left hand side assembly. In this spreadsheet, there are 2 important parts. There were bill of material and simulation trial for 12 component parts start with panel front door LH assembly and end with Brkt Fr Dr Rr Beltline Inr LH. 12 component parts required to assembly the panel front door left hand side were entered to excel worksheet with their items level and number of part as show in figure above. Then, the process of simulation trial will start. To run the simulation trial, few parameters and inventory status are required to run the simulation. For parameters, there were lead of part, safety stock, lot size and minimum quantity. And for inventory status, there were gross requirements, scheduled receipts, on hand inventory and net requirements. The program starts at level 0, with production of the final product, Panel Front Door LH Assy (Item 1). In this system the developer keep on inventory of 50 units (Cell B25) and the scheduled receipts of 10 units (Cell B24). The assumption demand or gross requirement for this system is 500 units (Cell J23). After the user enter the amount of unit as given above, the program calculate the net requirement and get 440 units required for final product (Cell J26). Because the lead time of the product is 1 week, planned order of the final product is required at Period 7 (Cell I28). Then the program moves on to level 1 material and expands the assembly plan for Item 1 (Final Product) into gross requirements for Panel Front Door Inr LH Assy and Panel Front Door LH Otr. The 440 units of Item 1 in week 7 is expanded into gross requirements of 440 units of Item 11 and 440 units of Item 12. The inventory status shows that the scheduled receipts for Item 11 and Item 12 are 30 units (Cell B33) and 20 units (Cell B42). This unit of receipts will deducted from gross requirement for both Item. The company needs order of 410 units of Item 11 at Period 6 (Cell H37) and 420 units of Item 12 at Period 4 (Cell F46). The gross requirement for Bar Assy Fr Dr Side Impact (Item 111) and Bar Assy Fr Dr Belt Line Inr Impact (Item 112) come from Panel Front Door Inr LH Assy (Item 11). 410 units of Item 11 started in Period 6 and this expands into gross requirements for 410 units of Item 111 and 410 units of Item 112. Finally, the program ends at level 3 for stamping components. There are Bracket Fr Dr Fr S/Impact LH (Item 1111), Bar Fr Dr Side Impact LH (Item 1112), Brkt Fr Dr Rr S/Impact LH (Item 1113), Bar Fr Dr Belt Line Inr LH (Item 1121), Brkt Fr Dr Fr Beltline Inr LH (Item 1122), Brkt Fr Dr Ctr B/Line LH (Item 1123) and Brkt Fr Dr Rr

Beltline Inr LH (Item 1124). Because in our program the assumption for inventory status for all Level 3 is 0 the gross requirements for all parts are 410 units each.

4.3 MRP Outputs

The primary outputs of an MRP system are the material requirements plans for each item as in Figure 4.1. But with all of this data, a system also can generate different kinds of output including:

1. Order and production released schedules, which specify the amount and timing of future orders and production runs for each item.
2. Order releases, which authorize the purchase or productions items.
3. Change reports, which highlight changes to the previous production and purchase plan
4. Load reports, which indicate the amount of each major production resource or department capacity that is to be utilized with the plan.
5. Performance reports, which show how well the system is working, including measures for investment in stocks, inventory turnover, costs and number of shortages.
6. Records of inventory transactions that keeping accurate records of current stocks and allowing checks on progress.

DISCUSSION

In this section, the discussion concerning the MRP model are identified and explored. The quality of MRP output depends in the quality of data input. Therefore, the quality of planning is directly proportional to the accuracy and structure of data held on the system, particularly demand determination, data on current inventory and bill of material.

For the demand determination, usually its gathers data from the marketing department (forecast and customer orders). The department of production planning, based on the information, prepares the MPS, ignoring capacity planning. The absence of capacity planning affects the stability of MPS, and MPS usually fluctuates, nearly an average 10% inflated at the end of production [6]. The possibility of changes in code numbers and structure of items will creates problem of the bill of material. Bill of materials is outdated because the design changes are not incorporated into the records, leading the parts lists that do not correspond to actual requirements for the assembly of the finished product.

The MRP model may be difficult to implement because it depends heavily on the accuracy of data fed into the system, particularly data on current inventory, bill of material and master schedules. In our finding, the human factor is considered as the most important aspect for the accurate and realistic input of data in order to achieve the efficient function of the system. Day-to-day problems arise due to oversight of the involved personnel during the interaction with the system, especially the ones responsible for updating the input data, the bill of materials and the inventory records. It is not unusual for the firm to discover that another part is being used without updating records.

The benefit when applying the MRP model are decrease of inventories, reduction in raw material and inventory costs, increased in consumer service, faster response to changes in market environment, and better management information through immediate access to information.