

CHAPTER 1

INTRODUCTION



1.1 Background of the Research

One of the important export products of Thailand is jewelry. Numerous revenue of the country has been brought in by exporting jewelry products. Furthermore, the trend of expansion of the jewelry market tends to increase along with the trend of fashion, which never stops. That implies the growth of the jewelry industry of Thailand, which has availability of the resources.

Jewelry industry is a labor-intensive industry due to the product characteristics, delicate products. Product design of jewelry always changes to respond to the requirements of the market. Replacement by machine is difficult to perform completely. The selling point of jewelry is design; therefore, production must be able to respond to both the variety of designs and the requirements of delicacy. These indicate that quality of product is the major key to success for the jewelry industry.

Nowadays, the jewelry market has high competition and it tends to become higher. Thus, the jewelry factory must consider not only the product quality but also cost and delivery of the product in order to survive in the market. To achieve low cost and on-time delivery, the production process flow becomes an important key factor. Inefficient process flow may result in the delay of delivery and that causes the manufacturer to incur high product costs. Because overtime work may be required in order to keep the delivery on time. Moreover, the higher cost from penalty is another result of inefficient process flow.

In addition, process flow management is an important tool to provide and achieve production objectives effectively. To manufacture the jewelry product, there are many processes involved. Each process has an interrelation with others; therefore, one process failure can cause overall process troubles. Thus, an effective process flow for production is required for achieving company goals.

A case study company is a jewelry factory. The size of the factory is a small enterprise. The company manufactures for only made to order. The markets of the company's product are both local and export but mostly for export market.

1.2 Production Processes

The details of production processes to manufacture jewelry are as follow.

1. Injection Mold: inject wax into plastic mold
2. Inspection: inspect the wax mold used for casting
3. Tree: make tree from the wax mold
4. Pour Ceramic Investment: pour ceramic to coat the tree
5. Dewax: melt the wax out of the ceramic mold
6. Harder Shell: embellish the ceramic mold
7. Remove Investment: make the body of jewelry by putting body material into the ceramic mold
8. Leach: wash the ceramic mold off
9. Dtree: cut the body off from the tree
10. Tumble: roll for polishing body of product
11. Inspection: inspect the product

1.3 Statement of Problem

The business processes of the company starts at the marketing & sale department receive customer orders and send them to the coordinate department. The coordinate department functions to manage production schedules and inform the raw materials management to prepare raw materials such gems for production. Then the production orders are distributed into the production department. However, job flow control in production is the responsibility of the coordinate department. The figure 1.1 shows the major production processes of the factory.

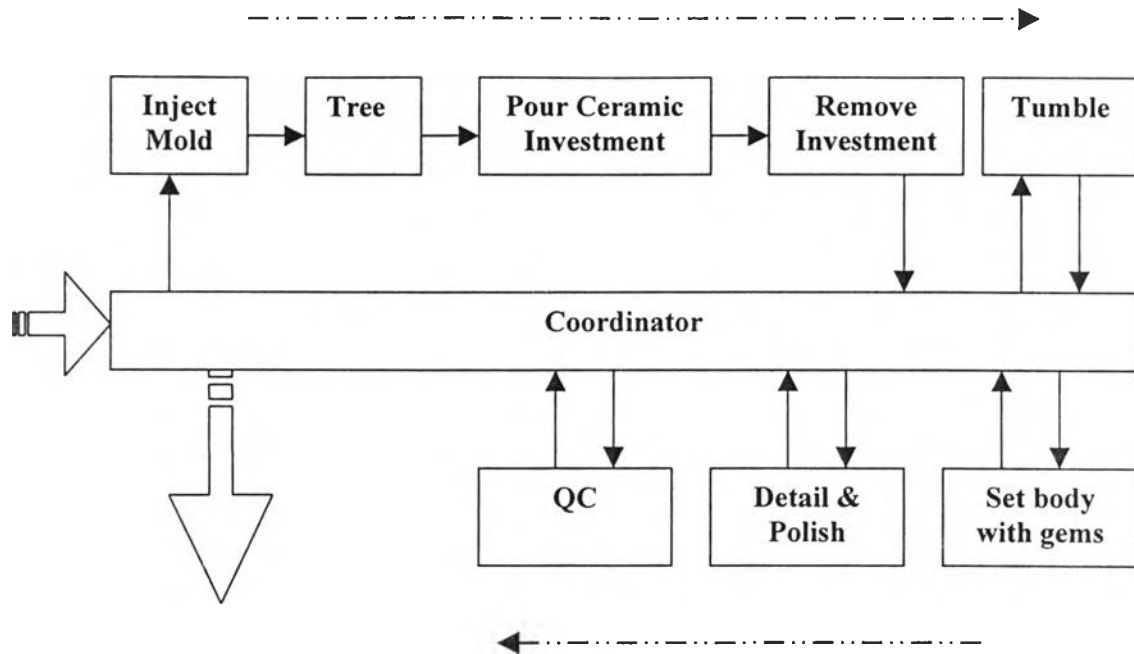


Figure 1.1: Production Process Flow.

Figure 1.1 illustrates the production job flow of the product. In practice, due to that manufacturing is based on skill, work in process defect is unavoidable. Therefore, rework often occurs during the production process of the manufacture. That leads the difficulty to the coordinate department to control the flow of work in order to keep production on schedule.

The current critical problem of the company is delay of delivery and high in product cost. That mostly causes from the inefficiency of production process flow system, which bases on experience. Furthermore, scheduling of each process is ambiguous, no schedule for each process available. That results in the unknown status itself of each process. Each shop does not know when to start their process in order to keep the production on time. In addition, the factory manufactures by first in first out; thus, when many orders are in hand and rework involve, there is no decision system support for the priority of product. That leads the factory fails to deliver products on time almost every order in hand, not just the reworked order. Table 1.1 in the next page shows the delivery data, mostly caused by the mentioned problems.

Another cause of the delivery problem is from production control document. The existing workflow operation is controlled by paper base control system, which goes along with the

products and has function to transfer the work between the processes. When rework occurs, that means the products have to separate into two direction flow: further to the next process and back to the previous process to repair the products. There is no production control document for the reworked products and that provides the rework process unable to be performed job at the right time. That also makes the coordinate department harder to follow and control flow of work.

Table 1.1 Delivery Data

JULY

Order No.	Amount	Delivery Schedule	Actual Delivery	No. of Variation
1	162	9/7/99	12/7/99	-3
2	366	9/7/99	12/7/99	-3
3	707	9/7/99	9/7/99	0
4	38	11/7/99	13/7/99	-2
5	60	13/7/99	9/7/99	+4
6	1200	13/7/99	26/7/99	-13
7	157	14/7/99	14/7/99	0
8	12	16/7/99	19/7/99	-3
9	97	19/7/99	19/7/99	0
10	650	21/7/99	21/7/99	0
11	1310	22/7/99	15/7/99	+7
12	1574	25/7/99	26/7/99	-1
13	126	26/7/99	26/7/99	0
14	1120	29/7/99	29/7/99	0
15	1185	29/7/99	18/8/99	-20
16	100	29/7/99	6/8/99	-8
17	21	29/7/99	30/7/99	-1
18	2620	31/7/99	4/8/99	-4
19	100	31/7/99	4/8/99	-4
20	4925	31/7/99	2/8/99	-2
21	100	31/7/99	4/8/99	-4
TOTAL	16630	TOTAL DELIVERY LATE DAY		68

Table 1.1 Delivery Data (Continued)

AUGUST

Order No.	Amount	Delivery Schedule	Actual Delivery	No. of Variation
1	205	1/8/99	6/8/99	-5
2	925	2/8/99	18/8/99	-16
3	150	2/8/99	2/8/99	0
4	60	3/8/99	6/8/99	-3
5	900	5/8/99	18/8/99	-13
6	680	5/8/99	23/8/99	-18
7	905	5/8/99	25/8/99	-20
8	2500	5/8/99	19/8/99	-14
9	1200	5/8/99	5/8/99	0
10	2700	5/8/99	5/8/99	0
11	50	5/8/99	6/8/99	-1
12	50	31/8/99	1/9/99	-1
13	76	7/8/99	10/8/99	-3
14	940	10/8/99	27/8/99	-17
15	1495	10/8/99	23/8/99	-13
16	1440	10/8/99	17/8/99	-17
17	1700	11/8/99	11/8/99	0
18	1000	12/8/99	27/8/99	-15
19	109	14/8/99	16/8/99	-2
20	480	15/8/99	16/8/99	-1
21	1050	15/8/99	27/8/99	-12
22	430	16/8/99	27/8/99	-11
23	440	17/8/99	2/9/99	-16
24	89	17/8/99	21/8/99	-4
25	350	22/8/99	6/9/99	-14
26	136	25/8/99	31/8/99	-6
27	2050	25/8/99	25/8/99	0
28	24	30/8/99	31/8/99	-1
29	93	30/8/99	31/8/99	-1
30	300	31/8/99	2/9/99	-2
TOTAL	22527	TOTAL DELIVERY LATE DAY		226

Table 1.1 Delivery Data (Continued)

SEPTEMBER

Order No.	Amount	Delivery Schedule	Actual Delivery	No. of Variation
1	350	6/9/99	6/9/99	0
2	42	8/9/99	8/9/99	0
3	2	8/9/99	8/9/99	0
4	378	9/9/99	9/9/99	0
5	385	9/9/99	9/9/99	0
6	100	9/9/99	6/9/99	+3
7	425	12/9/99	13/9/99	-1
8	20	14/9/99	14/9/99	0
9	200	15/9/99	15/9/99	0
10	658	16/9/99	16/9/99	0
11	669	16/9/99	16/9/99	0
12	343	20/9/99	20/9/99	0
13	650	22/9/99	21/9/99	+1
14	264	25/9/99	28/9/99	-3
15	550	28/9/99	22/9/99	+6
16	450	30/9/99	5/10/99	-5
17	1135	30/9/99	8/10/99	-8
18	414	30/9/99	5/10/99	-5
19	400	30/9/99	30/9/99	0
TOTAL	7435	TOTAL DELIVERY LATE DAY		22

The problems involved with this area of the company can be listed as in below.

1. Production planning has low efficiency.
2. The clear status of each process to produce the products is not available.
3. There is low production efficiency to respond the unavoidable of rework.
4. Handling product is not on time and a part of profits are cut from penalty.
5. Cost of product is high.
6. Customers dissatisfy.

1.4 Objective of the Research

The purpose of the research is to reduce the delivery delay.

1.5 Scope of the Research

The research studies only the process flow. The scope does not cover the difficult design, special design, and special order such as urgent order.

1.6 Research Procedure

1. Study related literature and theory
2. Collect related data of process flow from the factory
3. Analyse the process flow
4. Improve the process flow
5. Implement and evaluate the improvement
6. Summarize and recommend for further research
7. Prepare report and presentation

1.7 Expected Results

1. The results of this research would provide information and suggestion for appropriate process flow.
2. It will provide the better understanding of process flow.
3. It will be reduce the problem from handling product delay.
4. It will be useful for further development in jewelry factory.