CHAPTER III

CURRENT STATUS AND PROBLEM STATEMENT

This chapter describe the company organization, product characteristic, production process, customer characteristic, and current production planning method that relate to the internal procedure of product supply system. The beginning part will provide the basic information of the company in order to have more understanding on the business characteristic. Later part of the chapter will focus on the production planning discussion start from the problem found during the production planning process, cause of problem found, and direction for problem solving.

3.1. XYZ Organization

The XYZ has been run from 4 major divisions

3.1.1) Factory division: The division duty includes product manufacturing, production control and planning, product development, quality control, and line maintenance.

a) Maintenance section: responsible for production line and machine maintenance and other general maintenance

b) Research and Development section: responsible for the new product development in order to meet the customer requirement

c) Quality Control section: responsible for the product quality control to meet customer requirement and export food grade requirement

d) Production line 1 section: responsible for production of Arare product

e) Production line 2 section: responsible for production of Sembe product. The production line is newly implemented.

3.1.2) Personnel and Administration division: The division duty includes

a) Administration section: responsible for manufacturing administration and documentation

b) Personnel section: responsible for recruitment and human resource management

3.1.3) Accounting and Financial division:

a) Cost Accounting and General Accounting section: responsible for the company accounting control

b) Financial section: responsible for the company financial analysis

3.1.4) Marketing and Packaging division

a) Logistic section: responsible for corporate the import and export of the material and product

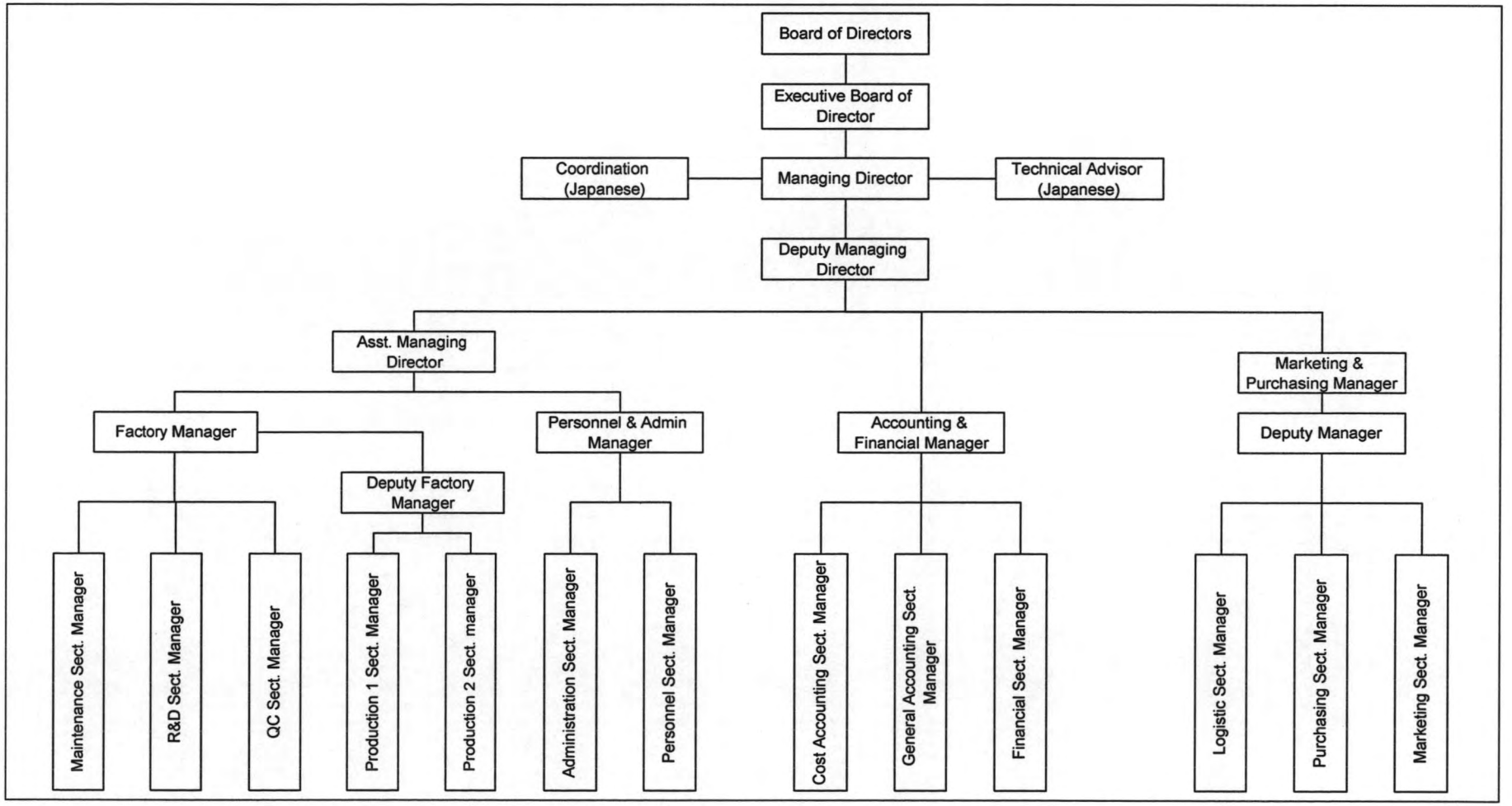
b) Packaging section: responsible for product packaging to customer order

c) Marketing section: responsible for sale and corporate with customer for order and delivery

Once marketing section receives order from customer, marketing will sort from the product list whether the product has been ordered or not. If product is available in the product list, marketing will distribute the order to factory section, and logistic section for further manufacturing and delivery.

If product does not exist in product list, marketing will coordinate with the research and development section in order to develop the correct product for customer need. Once product approve from customer, the new product will be set up in product list and register for manufacturing and register to order as general process.

Figure 3.1: XYZ Organization Chart



3.2. Product

XYZ product can be separated to 2 categories which are Arare and Sembe. Arare is the various shape of the glutinous rice baking product as previously shown in the figure 1.2.

Sembe is another kind of Japanese rice snack. Sembe is the new product for XYZ to expand the market share in the rice baking product. Sembe requires difference machinery and production line to Arare. Arare product was chosen for this thesis as this is the current XYZ major product.

3.2.1. Arare product characteristic

Arare is a type of snack made of glutinous rice. Mochi, or rice cake, is cut into small pieces and dried, after which is roasted, allowed to rise, and flavored using sugar and soy sauce. Arare is comparatively soft and it breaks easily in the mouth.

Arare can be made to various shape, colour, size, taste, and extra additional like dry seaweed or sesame, as previously shown in figure 3.1.

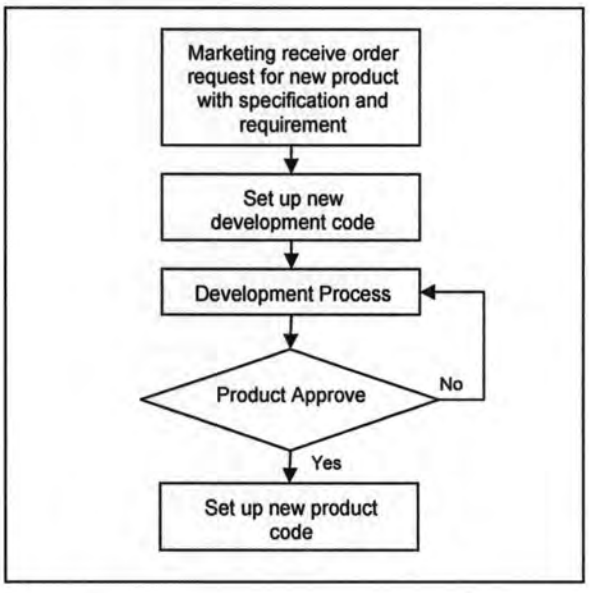
Table 3.1: Example of Arare Product Feature

Size	Colour	Shape	Taste	Addition
Short Long Small Medium Large etc.	Light White White Ivory Yellow Light Brown Brown Dark Brown Pink Green etc	Triangle Half Moon Rectangle Bean shape Fish shape Sakura shape Star shape etc	Plain Shoyu Wasabi Icing Strawberry etc	Seaweed Wrap Mix Seaweed Bead Sesame etc

3.2.2. Current Arare product coding

After marketing and R&D confirm new product, factory section will then set up the product code base on the sale code.

Figure 3.2: Current coding system



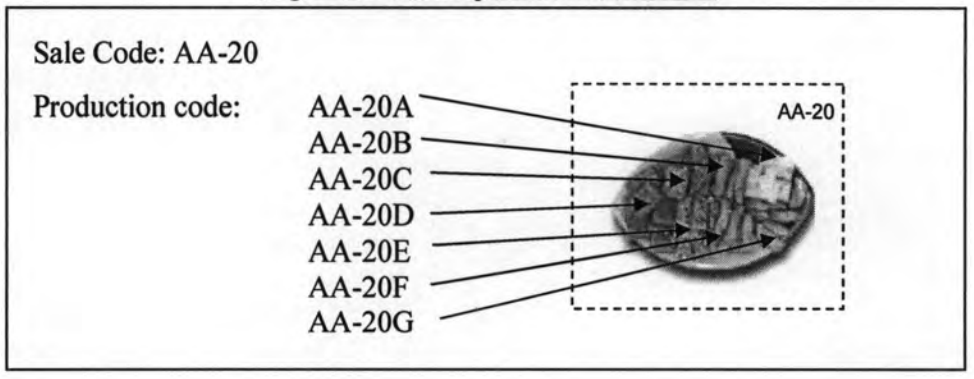
Product code has 2 levels

- Sale code: A customer product code that marketing will use for ordering. This code can be the same as production code when customer order single Arare product. But if the order require mixed of Arare in one product, this sale code will be separately generated.

- Production code: Code for single product for production to control the Arare manufacturing in the plant and for finance to track the resources usage.

One sale code may include at least 1 production code or more. The current method to identify sale code and production code is base on customer. The code will start from customer code then follow by product code as example in figure 3.3.

Figure 3.3: Example of Product Code



It can be seen that the production code was set based on the sale code with out relate to product characteristic. This cause the difficulty to identify the single product specification, only the person who knows the product very well will be able to identify promptly.

Total Arare production code existing in the system is 1029 products. Variation comes from

- 48 cutting gear sizes
- 20 ways cutting alignment
- 21 patterns
- 325 ingredients

Of which the actual production during 2006 have 139 sale products only.

In addition, current BoM code was created based on marketing product code not from manufacturing product characteristics. This causes difficulty to remember and non systematic for the whole product ranges. Note that one marketing product may compose of many company products or so called mix product package.

3.3.Arare Production Process

There are 10 steps for Arare production process.

3.3.1. Rice selection and cleaning : rice will be selected for the required grain size then quickly wash away the impurities then left it soak with water

3.3.2. Grind and Steam : grind the rice till smooth then steam it

3.3.3. Pounding : the steamed rice will then be pounded repeatedly to make Mochi dough (rice cake)

3.3.4. Form and Aging: put mochi dough into the forming container and keep it to set in the low degree temperature room for two nights.

3.3.5. Cutting: after two nights mochi is cut into required sizes and shapes.

3.3.6. Drying : the cut mochi will be dried again to make sure the water content in mochi is right to the specified degree

3.3.7. Baking and Roasting: bake and roast cut mochi in both traditional and down secret recipes to the right color and savory aroma, do not fry so it is fat free.

3.3.8. Flavoring: flavor the Arare with selected recipe of ingredients

3.3.9. Seaweed wrapping : wrap Arare with Japanese dry seaweed

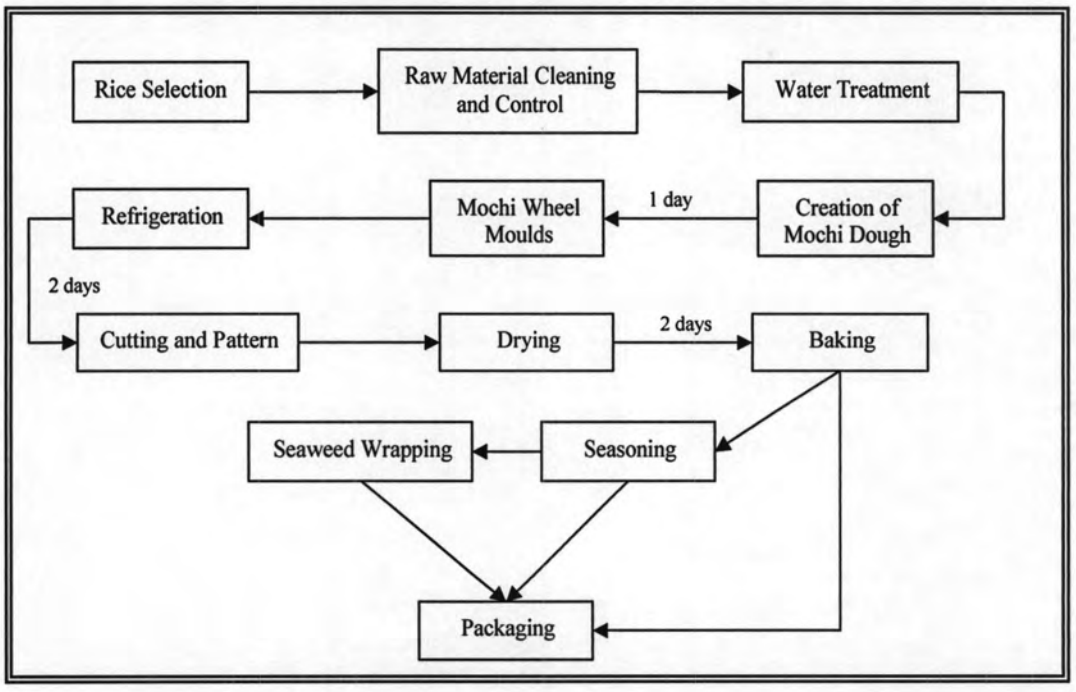
3.3.10. Packing : the finished Arare will then be packed to the order ready to delivery

Process 1-7 are fixed processes that all products must pass through. Process 8 and 9 will be different base on the order and recipe.

One cutting pattern can be made in various sizes and baked to many colours; e.g. white, ivory, light brown, brown, and dark brown. Each baked Arare can then have choices of seasoning recipes. This product diversity leads to difficulty in production scheduling. While company current production scheduling relies on the expert production control engineer to arrange and judge daily plan. This manual process is, even though flexible, difficult and slow, and that some optimize solution

may be overlooked because of lack of good information support tools to help filter possible parameters.

Figure 3.4: Arare Production Process



The machines used in the production process including:

Table 3.2: XYZ machine capability

Machine	Number of Machines	Yield
a) Rice steaming	3	61%
b) Cutting machine	13	80%
c) Drying machine	23	75%
d) Baking machine	16	87%
e) Seasoning machine	4	54%
f) Packaging line	4	84%

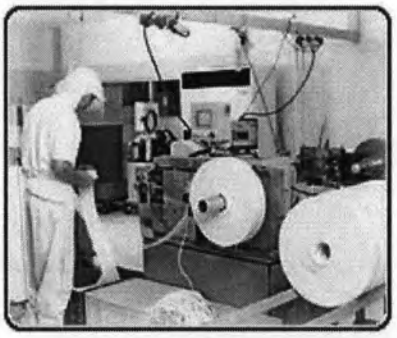
It can be seen that the bottleneck is on seasoning machine which has only 4 machines and low yield value of 54%. When changing recipes, the seasoning machine must be washed and it takes up to 6 hours. This means changing of

seasoning recipe will significantly reduce machine capacity per day and has an impact on the whole production line as the previous work in process will be bottlenecked and the later process will be idle.

Current situation that the production planning do for seasoning process is to keep stock of baked products that use same seasoning recipe and seasoning all in one day. To do this planning, the company still rely on the expertise of the planner and seasoning supervisor to group product and scheduling.

Figure 3.5: Production Process

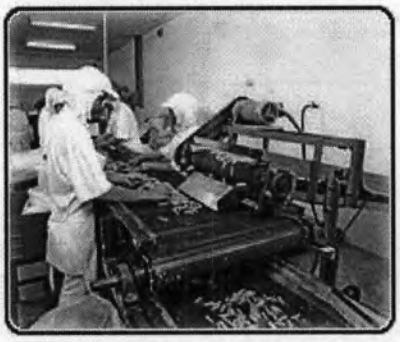
Refrigerate Mochi Wheel (3 days)



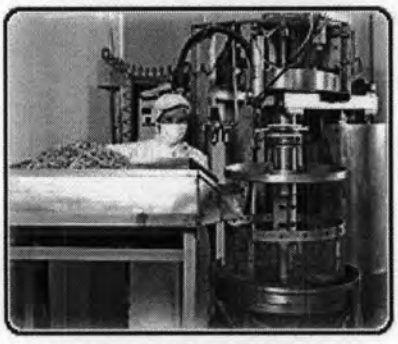
Cutting Mochi dough (1 day)

Drying cut dough (2 days)

Feeding cut dough to oven



Quality control baked dough (1 day)



Seasoning with sauce (1 day)

Seaweed wrapping (1 day)

Packing and ready for delivery (1 day)

3.4.Customer & Sale Characteristic

Current XYZ customer profile has 19 overseas customers from 8 countries which equal to 96.5% of total sale in 2006 and some domestic products 3.5%.

Table 3.3 : XYZ 2006 Sale characteristic

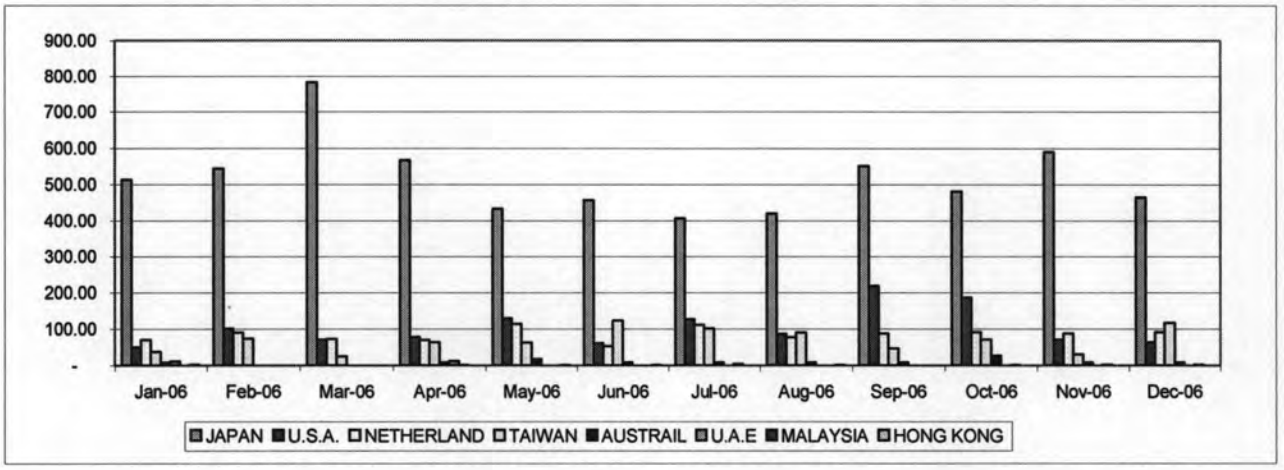
Country	Number of Customer	Total Sale (Ton)	Total Sale (K$)	%
JAPAN	7	1,704	6,209.06	65%
U.S.A.	4	458	1,246.51	13%
NETHERLAND	1	825	1,020.97	11%
TAIWAN	1	157	845.41	9%
AUSTRAIL	2	91	114.77	1%
U.A.E	2	11	23.59	0%
MALAYSIA	1	5	11.58	0%
HONG KONG	1	4	7.74	0%
Total	19	3,255	9,479.62	100%

Table 3.4 : XYZ 2006 Sale per country

ITEM	AREA	BUYER	Order (Ton)	Value of Buy ($)	%	
1	JAPAN	KAMEDA	615	3,084,091	33%	
2	JAPAN	CONFEX	463	1,517,265	16%	
3	NETHERLAND	MENKEN	825	1,020,966	11%	79%
4	U.S.A.	KTM	365	992,508	10%	
5	TAIWAN	FALKEN	157	845,412	9%	
6	JAPAN	NAGATANIEN	320	656,834	7%	
7	JAPAN	KUZE	117	455,472	5%	
8	JAPAN	SANESU	118	308,918	3%	
9	U.S.A.	JFC 'INC'	36	165,821	2%	
10	AUSTRAIL	SCALZO	84	105,909	1%	
11	JAPAN	ABEKO	47	99,116	1%	
12	JAPAN	K&B	24	87,365	1%	
13	U.S.A.	TROPI-CON	44	63,419	1%	
14	U.S.A.	GREAT LAKES	13	24,757	0%	
15	U.A.E	BEST FOOD	6	12,742	0%	
16	MALAYSIA	ORIION	5	11,582	0%	
17	U.A.E	LEBANESE	5	10,850	0%	
18	AUSTRAIL	RIVERINA	7	8,858	0%	
19	HONG KONG	FSML	4	7,740	0%	
		Total	3,255	9,479,624	100%	

Figure 3.6: Sale Characteristic by Country

SALE (KUSD)	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	TOTAL
JAPAN	512.62	544.86	781.51	566.96	432.35	455.79	406.62	419.86	551.96	481.98	589.70	464.85	6,209.06
U.S.A.	50.67	102.08	71.16	79.77	129.22	61.30	126.76	86.39	218.25	185.75	71.22	63.95	1,246.51
NETHERLAND	70.77	90.89	72.42	70.77	114.25	52.58	111.74	77.85	87.96	92.33	87.96	91.44	1,020.97
TAIWAN	38.17	73.93	25.70	64.10	62.64	123.47	102.43	90.00	46.70	71.51	29.95	116.81	845.41
AUSTRAIL	8.86	-	-	8.86	17.72	8.47	8.86	8.86	8.86	26.57	8.86	8.86	114.77
U.A.E	10.85	-	-	12.74	-	-	-	-	-	-	-	-	23.59
MALAYSIA	-	-	-	1.41	-	-	3.23	-	-	1.78	2.12	3.04	11.58
HONG KONG	2.58	-	-	-	1.72	1.72	-	1.72	-	-	-	-	7.74
TOTAL	694.52	811.75	950.79	804.62	757.89	703.32	759.63	684.68	913.73	859.93	789.81	748.94	9,479.62



Order type can be separated into 2 categories.

- Continuous order: the product is ordered from the same customer almost every month for at least 6 months per year. Continuous order can be grouped to 2 types;

    1. Continuous Order type 1: for the order from same customer at lease 10 months per year

    2. Continuous Order type 2: for the order from same customer at lease 6 months per year

- Discrete order: the product is ordered less than 6 months per year.

Table 3.5: Arare order type

Order type	No of Product sale in 2006	%	Weight 1000kg	Sale 1000$	%
Continuous type 1	19	13%	1,623	5,525	58%
Continuous type 2	29	19%	1,206	2,746	29%
Discrete	103	68%	425	1,209	13%
Total	151	100%	3,255	9,480	100%

It can be seen that the discrete order consume most of ordering time 68% but result to only 13% of turnover. While the continuous order type 1 have only 13% number of order per year but value of turnover was high as 58% of total sale in 2006.

Since company policy is to keep customer relationship, and not to ignore the small value of buy for future opportunity. It is important to maintain the production capability and ability to manage with the discrete order.

Since there are continuous order, and discrete order, the production lines will be reserved for continuous and constant demand products, and the remaining capacity will be filled with the discrete orders. As from constraints above, the discrete orders need to be carefully scheduled to the production plan and corresponded with the existing schedule as much as possible.

3.5.Current Planning Process

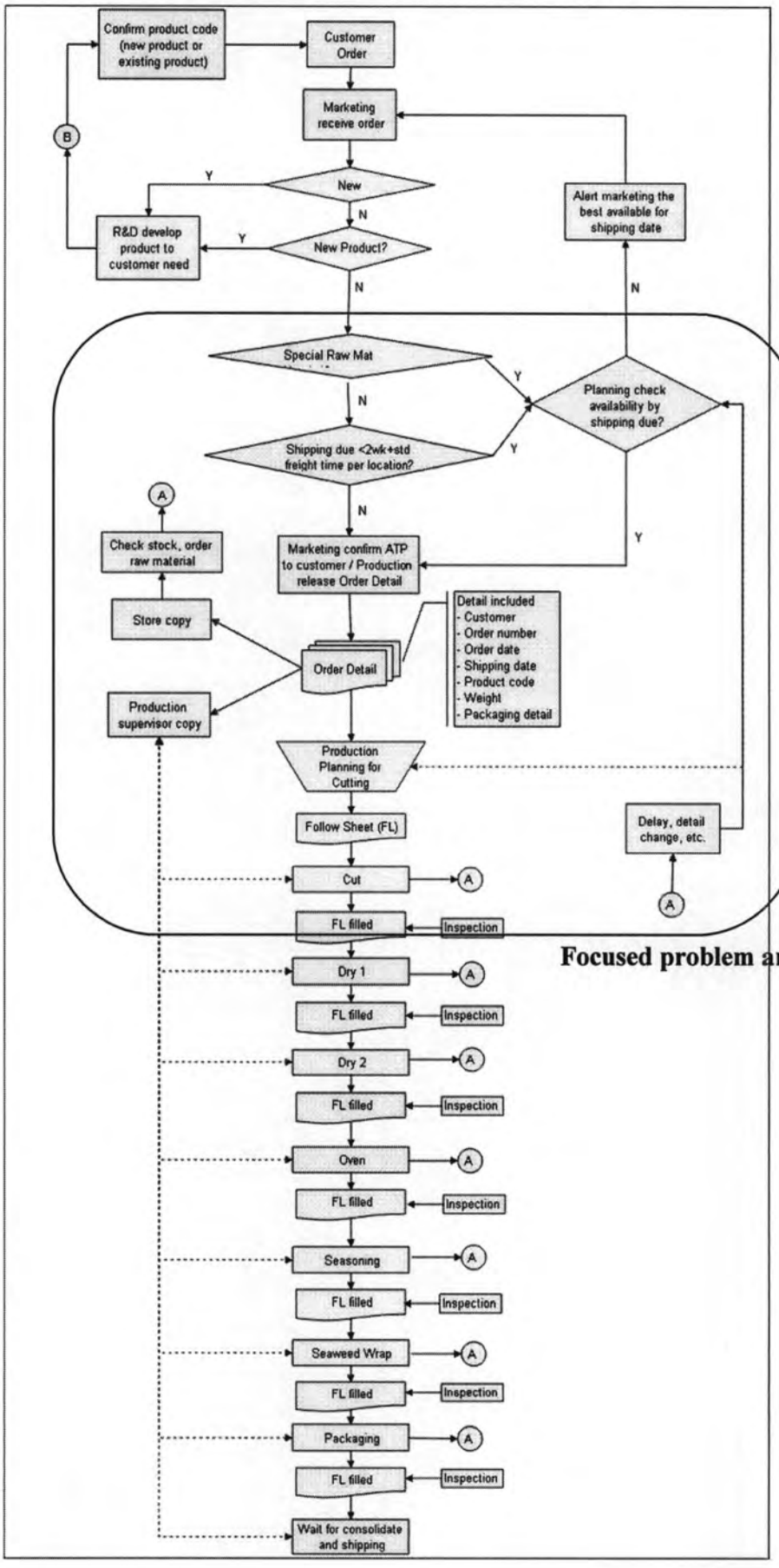
The figure 3.7 shows current company supply work flow start from receiving order until packaging product wait for shipping. The current system uses the standard criteria for order response of 2 weeks plus freight time for the normal acceptable time interval during order date to delivery. This means the 2-weeks-period will be included raw material order, and steaming process until packaging process finish which is ready to delivery. If the due is less than standard criteria, marketing will transfer detail to production department to check capability and confirm if the product can be delivered per date require or not and by when the order will be completed. Then marketing will confirm quote to customer. Once the quote confirm, marketing will confirm detail of order to production department. The production planning team will then generate the

Order Detail sheet, figure 3.9, to confirm order and requirement to each section; including raw material stock, production line supervisor, production planning, and finish goods store room. Each section can raise a request for changing delivery due if found any problems that impact the available-to-promise.

Production planning team will then generate the manufacturing plan for the received order manually in the excel spreadsheet. The planning is made with reference to cutting process capacity without considering other production processes. The steaming process until fridge dough will need 3 days for Mochi dough to be set, then the later process will use total of 7 days for production from cutting to seaweed wrapping. Therefore the planning has use this standard time to calculate the start of production date for cutting then other process assume plan as standard time.

Once the daily plan for cutting is completed, see figure 3.10, production planning will release Follow Sheet that indicate product code, start of cutting date, as shown in figure 3.11. The other process detail will be input by the operator in each operation for the actual production result after finish each process. The Follow Sheet will go together with the product from the cutting process until packing finish. Hence, the sheet is hard copy and input in hand writing. Each production process will report to the production supervisor for the production status and problem occurs to any batch found.

Figure 3.7: Current product supply process



Focused problem area

Figure 3.8: Current Product Supply Process (B section)

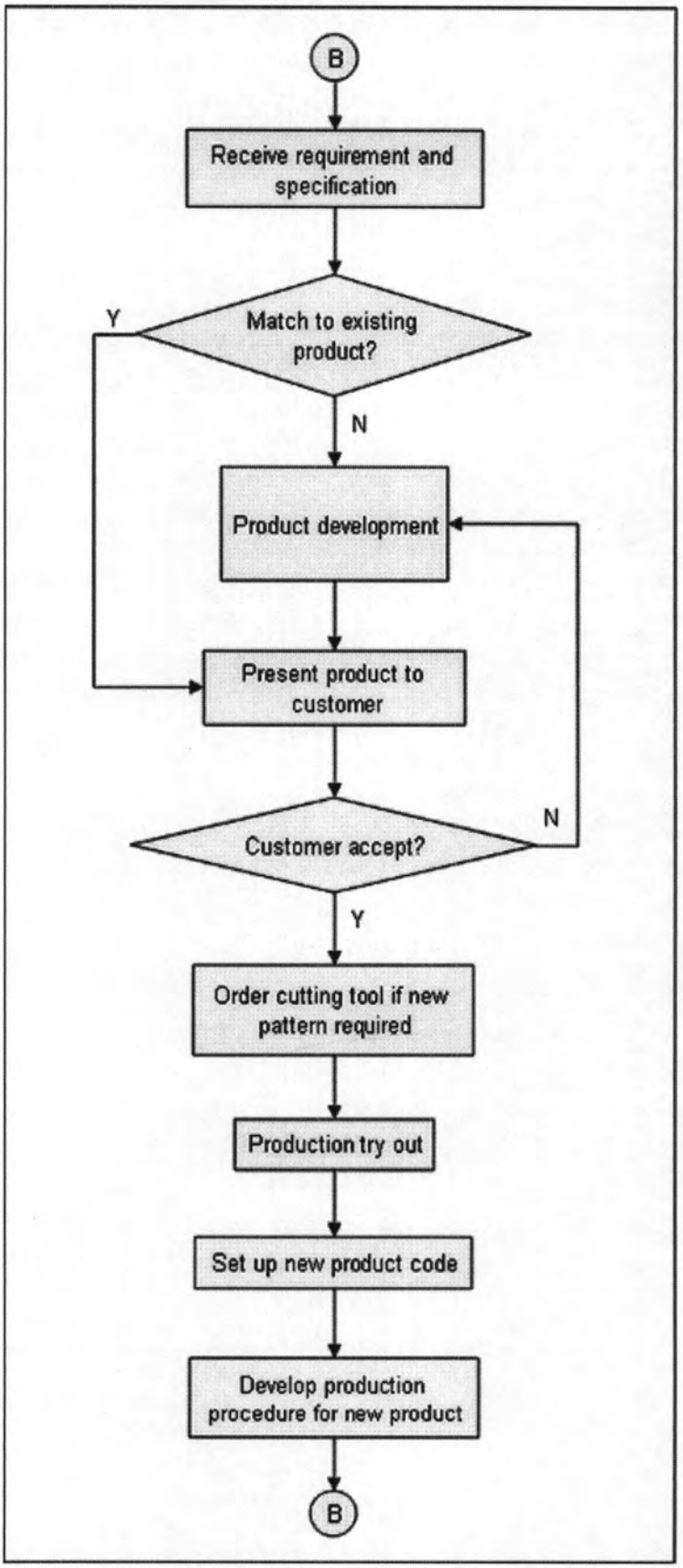


Figure 3.9: Example of Order Detail

Order Detail

Order No _____ Order Date _____ Delivery Date _____
Buyer _____ Reference no _____ Revision _____

Detail

						Small Pack		
Item	Product Code	Box	@/kg	Weight	Remark	kg/pack	kg/box	Remark
1								
2								
3								
4								
5								
6								

Packing Detail

Item	Shipping Mark No	Bag Size	Bag layer	Absorber	Seal Method	Production Date	Expire Date	P/O no	Batch Lot Code	Remark
1										
2										
3										
4										

Box Seal ☐ OPP Tape ☐ Tape

Loading Detail ☐ Normal ☐ Special _____

Other remarking for production technique

_____

Copy: Asst.Mng.Prod., Prod.Sup.,Store,WIP

Check: _____

Approve: _____
Production Manager

Figure 3.10: Example of Daily Cut Order

FACTORY CUT ORDER

CUT ORDER NUMBER
Order Date

Time/Fl (min)	60	40	25	
Thickness by Group	A ⩽ 2.5	B 2.6⩽X⩽4.99	C ⩾ 5	
FL	25	12	15	
Time/Group	1500	480	375	2355
TOTAL (HR)				39.25

CUTTING	Remark	1st Dry	2nd Dry	3rd Dry	4th Dry	Baking
02-Mar-06	NORMAL1	02-Mar-06	03-Mar-06			04-Mar-06
02-Mar-06	NORMAL2	02-Mar-06				04-Mar-06
02-Mar-06	SPECIAL1	02-Mar-06				03-Mar-06
02-Mar-06	SPECIAL2	06-Mar-06	08-Mar-06			09-Mar-06
02-Mar-06	SPECIAL3	06-Mar-06				08-Mar-06

FOLLOW NO.		CODE	PRODUCT	DESCRIPTION	CUT NOZZ	ROLL g/line	MACH	TOTAL roll/board	TOTAL (KG)	1st Dry	2nd Dry	3rd Dry	BACKING COLOR	BAKING MACHINE	MARK	BAKE WEIGHT	OPTION MIX

Remark

Figure 3.11: Example of Production Follow Sheet

XYZ Follow Sheet

Cut Order No _____ Follow Number _____ Order Number _____
Product Code _____ Special Note _____

Cutting			**Dry**		**Dry**		**Dry**	
Date		M/C no.	Dry 1		Dry 2		Dry 3	Special Dry:_____
Start time		End time	Date	% moist:	Date	% moist:	Date	% moist:
Steam Date		Cart no.	Dry Machine no.	% moist:	Dry Machine no.	% moist:	Dry Machine no.	% moist:
Cut Roll/box		Weight(kg)	Start time	End time	Start time	End time	Start time	End time
Mochi	cut	dry	Box use	boxes	Box use	boxes	Box use	boxes
Date		box	Weight	kg	Weight	kg	Weight	kg
☐ quality pass			☐ quality pass		☐ quality pass		☐ quality pass	
☐ correction pass			☐ correction pass		☐ correction pass		☐ correction pass	
Resp:		shift	Resp:	shift	Resp:	shift	Resp:	shift
Pending	Approved		Pending	Approved	Pending	Approved	Pending	Approved
Shift sup.	manager		Shift sup.	manager	Shift sup.	manager	Shift sup.	manager
Bake	☐ **Auto**	☐ **Long**	**Seasoning**		**Packaging**		**Seasoning**	
Date	Start	End	Date	Start End	☐ pack 1	☐ pack 2 ☐ pack 3	☐ Seaweed 1	☐ Seaweed 2
M/C no		%moist:	☐ Machine	☐ Manual	Date		Date	
weight before		Box:	Dry no		Line		☐ dip	☐ spin
weight after		Box:	weight per bag	Box	Start time	End time	Start	End
waste					weight goods		Weight before	
std weight			weight before		waste		color	☐ green ☐ light green
color	☐ light white	☐ white	sauce no					☐ dark green ☐ other
☐ brown	☐ dark brown	☐ light brown	remark:		remark:		remark:	
☐ quality pass			☐ quality pass		☐ quality pass		☐ quality pass	
☐ correction pass			☐ correction pass		☐ correction pass		☐ correction pass	
Resp:		shift	Resp:	shift	Resp:	shift	Resp:	shift
Pending	Approved		Pending	Approved	Pending	Approved	Pending	Approved
Shift sup.	manager		Shift sup.	manager	Shift sup.	manager	Shift sup.	manager

Remark: Pending WIP with problem on product quality that may impact consumer, red mark
Approved WIP with problem that already operate the correction or solve the problem, other mark

3.6.

Since the plan is based on first-come-first-serve basis and the company strategy is made-to-order as the product shall not be kept more than 7 days before shipment, the ATP calculation is basic calculation as below.

$$\text{ATP} = \text{Total Available Capacity} - \text{Actual Production}$$

For example, table 3.6 shown the cutting plan based on the 7 days production assumption. The product A was required to ship on day 15, therefore the first cutting date must start from day 8. Since the planning is based on cutting process only, table 3.7 shown the calculation of ATP as per above formula. The total available capacity is the cutting capacity 3378 kg per day (calculate from assumption 1126 kg/machine * 3 machines available per day). The actual production is total number of order plan for the day, for example day 8 had planned to make product A and D for 900 and 1300 kg respectively. Therefore the ATP for day 8 is 3378 – (900+1300) = 1178 kg.

Table 3.6: Example of Current Production Plan

Product	Order Date	Shipping Date	Qty kg	Day										
				8	9	10	11	12	13	14	15	16	17	18
Product A	Day 1	Day 15	900	C	D1	D2	B	S	W	P	Ship			
Product B	Day 1	Day 16	1453		C	D1	D2	B	S	W	P	Ship		
Product C	Day 2	Day 17	2200			C	D1	D2	B	S	W	P	Ship	
Product D	Day 2	Day 20	1300	C	D1	D2	B	S	W	P	Ship			
Product AA	Day 3	Day 18	1125				C	D1	D2	B	S	W	P	Ship

Where: C = Cutting, D1 = Dry 1, D2 = Dry 2, B = Baking, S = Seasoning, W = Wrap seaweed, P = Packing, and Ship = Ship date

Table 3.7: Example of Current ATP Calculation

	Product	Order Date	Shipping Date	Qty kg	Day			
					8	9	10	11
	Cutting Capacity				3378	3378	3378	3378
	Actual Production				2200	1453	2200	1125
	ATP				1178	1925	1178	2253
Product Ordering	Product A	Day 1	Day 15	900	900			
	Product B	Day 1	Day 16	1453		1453		
	Product C	Day 2	Day 17	2200			2200	
	Product D	Day 2	Day 20	1300	1300			
	Product AA	Day 3	Day 18	1125				1125

Unit in Kg.

3.7. Problem Analysis

According to the current business characteristic, order are varies on the customer requirement. The effective production planning is critical to the company as the real time analysis of production capability in order to confirm order with customer and the ability to produce high variation of product at the same time helps the company to expand the market and keep customer satisfaction. The current production planning problem can be identified in 2 direction; business requirement (output information), and planning requirement (input information). The root causes of problems found were then analysed using Cause and Effect diagram.

3.6.1. Business requirement on Production Planning (Output information)

From confirmation on the company requirement on planning work, the generic business requirements on the production planning for XYZ Company are;

- Ability to response the reliable available-to-promise
- Ability to manager the production planning in order to deliver as committed
- Ability to detect problem that may cause delay to the delivery

The current planning process cannot fully response to the company business requirement, as can be seen in more detail in table 3.8.

Table 3.8: The Business Requirement for Production Planning

Business Requirement	Requirement Detail	Current Status	Problem Occurred	Possible Solution
1. Ability to response the reliable available to promise	> Planning to receive the RFQ and confirm ATP	> Planning only confirm ATP on the order with production time less than 2 weeks > Production planning cannot response to all order due to time consuming	> The production capacity may be loaded during the certain period and to accept order without confirm with production planning cause the delay due to limit capacity	> Marketing to confirm with planning every order > Make the planning process more robust and less time consuming > Production planning to have all information relate production capacity and stock availability on hand
	> Planning to recommend the best ATP on ship date and next possible ship date for total order	> Planning need to confirm with production line, finish goods store, and raw material stock for the actual ATP and confirm if the shipment can be maintained or require change	> Time consuming for confirmation due to need information from other sections > In correct confirmation due to communication problem > In correct confirmation due to information missing	

Table 3.8: The Business Requirement for Production Planning (cont.)

Business Requirement	Requirement Detail	Current Status	Problem Occurred	Possible Solution
2. Ability to manage the production plan in order to deliver as committed	> Planning shall generate production plan for each product that consider availability of every production process required	> Production plan generate based on the standard 7-days-production cycle and manage the plan on start date for cutting process only > Production plan based on the yearly capacity assumption, does not have update real time machine yield	> Delay due to order at high quantity and production capacity not available > Delay due to real time situation has less yeild than plan from machine not available based on long set up time and high product variation > Delay due to other process require special treatment and longer than standard time > Wrong information input based on lack of experiece or planner fatique	> Plan for all process > Production and stock timely update information to plannning > Set cross functional team for problem coverage > FL contain both plan/expected result vs actual result for every process > Set up product grouping method that help planner understand product commonize > Every plan consider ability to consolidate production grouping

Table 3.8: The Business Requirement for Production Planning (cont.)

Business Requirement	Requirement Detail	Current Status	Problem Occurred	Possible Solution
2. Ability to manage the production plan in order to deliver as committed	> Planning shall release the work follow sheet with the directional information based on planning in order that the operator can cross check whether the operation follow plan	> The work follow sheet only specified cutting date and does not have information for other process expected plan > The operator only input data in the FL after finish his process	> Don't know the status of the product production, need to check with operating line and time consuming > Wrong information input > Actual production does not in-line with plan and does not feedback to the planner	
	> Planning shall consider best utilization of machines and facilities by grouping same specification product to produce together	> Planning made based on first-come-first-serve basis, less consider the product grouping > Great variation of product made it difficult to planner to group the product	> Set up machine often based on each product, decrease production yield > Bottle neck at the low yield processes > Product complexity from difference ingredients leads to poor production scheduling	

Table 3.8: The Business Requirement for Production Planning (cont.)

Business Requirement	Requirement Detail	Current Status	Problem Occurred	Possible Solution
3. Ability to detect problem that may caused delay delivery	> Planning shall be able to run daily plan and detect any flaw occur due to manufacturing so that can find the solution to maintain delivery date	> Planning only confirm cutting date > Production section will alert if found possibility not to meet due	> Cannot solve the problem in time and cause delay to delivery > Reduce customer satisfaction > Bad reputation	> Center information at planning > Set cross-functional-problem-solving team > Group and identify problem and make the standard solution
	> Planning shall alert to marketing department for the possibility of delay and expected date for ATP	> Whoever found problem will alert marketing (store, production, planning)	> Miss communication > Many party make confusion > Long lead time for problem solving	

3.6.2. Generic Planning Information Required (Input information)

The generic information required for planning work including below information.

- Order detail
- Production efficiency
- Work in process
- Back log
- Raw material store
- Finish goods stock
- New product information

From discussion with the planner, the current operation does not receive the sufficient information as required since the production information has been carried out in the FL paper which does not have timely update to the computer for the daily report. Also the planning has been using the yearly standard production capacity without real time confirmation on actual yield or down time.

3.6.3. Cause and Effect Diagram

Based on the analysis of problem on current planning process discussed in 3.6.1 and 3.6.2., the Cause and Effect diagram was created in order to find the root cause of the problem. The diagram classified in 4 major factors which are man, machine, material, and method as shown in figure 3.12.

The Cause and Effect diagram revealed that the current planning method is the root cause of the problems found. The existing planning method has many flaws as prior discussed that led to the impact to other factors.

Figure 3.12: The Cause and Effect diagram: XYZ inefficient production planning