

AN ANALYSIS OF PRODUCTION CAPACITY OF MOCAF FLOUR PRODUCT AT KARUNIA MAHA CIPTA, BANDUNG

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Abstract - The development of food technology, produces flour from cassava which has similar characteristics to wheat flour called as mocaf (modified cassava). Karunia Maha Cipta as mocaf producer in Bandung has labelled their product as Mocaf Bandung. An analysis of business models regarding these products have been done to determine the position of Karunia Maha Cipta in the mocaf flour industry. Actual data from product sales until production process from last few months was used to analyze and modelling the existing system. Based on business model analysis, the market share for Mocaf Bandung too small only covers small-scale food industry and households. Root cause analysis showed that root causes were: insufficient production capacity, no backup machine, no market analysis and disobedient supplier. The possible solutions that have been made are: increasing production capacity with three alternatives there is adding more production schedule, purchasing new machine, mixed between purchasing new machine and adding more schedule; new raw material regulations system for supplier, and do market analysis. The result of proposed solution is predicted to increase the production capacity by 119% and increase in profit by 265%.

Keywords: Production Capacity, Business Model Canvas, Mocaf, Production Process, Capital Budgetting, Sensitivity Analysis, Root Cause Analysis.

Introduction

The development in food industry, lifestyle shift and the government policy has triggered a change in people's consumption habits over the last two decades. In the lifestyle people tend to choose something practice and instant, the limited time on serving daily food has triggered people to choose fast food. Advancement of food technology pushes the development of fast food. That caused fast food consumption in Indonesia continuous to grow.

The changing of food consumption makes the need of base flour product increasing rapidly. Flour on average is used as main raw material for fast food. This changing makes some opportunity for food industry that use local flour product. Indonesia has big tubers potential as flour main raw material. With food technology, it can produce cassava flour that has same characteristic as wheat flour. Technology for processing cassava into mocaf flour is simple and cheap. With this technology, small scale industry can make high quality product that has not inferior to large-scale industry.

Karunia Maha Cipta is a food industry specializing in mocaf (modified cassava flour) products that located in Bandung. Its business activities cover from production, marketing, quality control and distribution. In every months, the demand from its customer always change significantly, so this condition always makes the production capacity in KMC has problem to fulfill the demand from its customer. Especially the demand from large food industry, because the current production capacity can only fulfill small quantity demand such as home-industry that use mocaf as raw material. This situation makes KMC realize that they have to increase their production capacity to enlarge the market share and become market leader in mocaf flour industry.

Literature Review

Capacity

Capacity is the “throughput” or the numbers of units a facility can hold, receive, store, or produce in a given time (Hezier & Render, 2011: 314). Capacity decisions often determine capital requirements and therefore a large portion of fixed cost. Capacity also determines whether demand will be satisfied or whether facilities will be idle.

1. Design capacity is the maximum theoretical output of a system in a given period under ideal conditions (Hezier & Render, 2011: 314).
2. Effective capacity is the capacity a firm expects to achieve given the current operating constraints (Hezier & Render, 2011: 315).
3. Capacity analysis involves determining the throughput capacity of workstations in a system and ultimately the capacity of the entire system (Hezier & Render, 2011: 320).
4. A bottleneck is an operation that is limiting factor or constraint. A bottleneck has the lowest effective capacity of any operation in the system thus limits the system’s output (Hezier & Render, 2011: 320).
5. Process time of a station as the time to produce a given number of units (or batch of units) at those workstations.
6. Process time of a system is the time of the longest process (the slowest workstations) in the system, which is defined as the process time of the bottleneck (Hezier & Render, 2011: 321).
7. Process cycle time, on the other hand, is the time it takes for a unit of product (Hezier & Render, 2011: 321).

Capital Budgeting

Capital budgeting is the process of evaluating and selecting long-term investment that are consistent with the firm’s goal of maximizing owner’s wealth (Gitman & Zutter, 2012: 390). Firms typically make a variety of long-term investments, but the most common is in fixed assets, which include property (land), plant and equipment. These assets, often referred to as earning assets, generally provide the basis for the firm’s earning power and value.

1. Payback Period
Payback periods are commonly used to evaluate proposed investments. The payback period is amount of time required for the firm to recover its initial investment in a project, as calculated from cash flow (Gitman & Zutter, 2012: 393).
2. Net Present Value
The method used by most large companies to evaluate investment projects is called net present value (NPV). The intuition behind the NPV method is simple. When firms make investment, they are spending money that they obtained, in one form or another, from investors (Gitman & Zutter, 2012: 397).
3. Internal Rate of Return
The internal rate of return (IRR) is the discount rate that equates the NPV of an investment opportunity with 0 (because the present value of cash inflows equals the initial investment) (Gitman & Zutter, 2012: 401).
4. Net B/C Ratio
Net benefit/cost ratio is ratio attempting to identify the relationship between the cost and benefits of a proposed project (Investopedia.com, 2014). Benefit cost ratios are most often used in corporate finance to detail the relationship between possible benefits and costs, both quantitative and qualitative, of undertaking new projects or replacing old ones.

Business Model

A business model describes the rationale of how an organization creates, delivers, and captures value, in economic, social, cultural or other contexts (Osterwalder & Pigneur, 2010). The process of business model construction is part of business strategy. The Business Model Canvas is a strategic management template for developing new or documenting existing business models. It

is a visual chart with elements describing a firm's value proposition, infrastructure, customers, and finances. It assists firms in aligning their activities by illustrating potential trade-offs. The nine blocks cover the four main areas of a business: customers, offer, infrastructure, and financial viability. The business model is like a blueprint for a strategy to be implemented through organizational structures, processes, and systems.

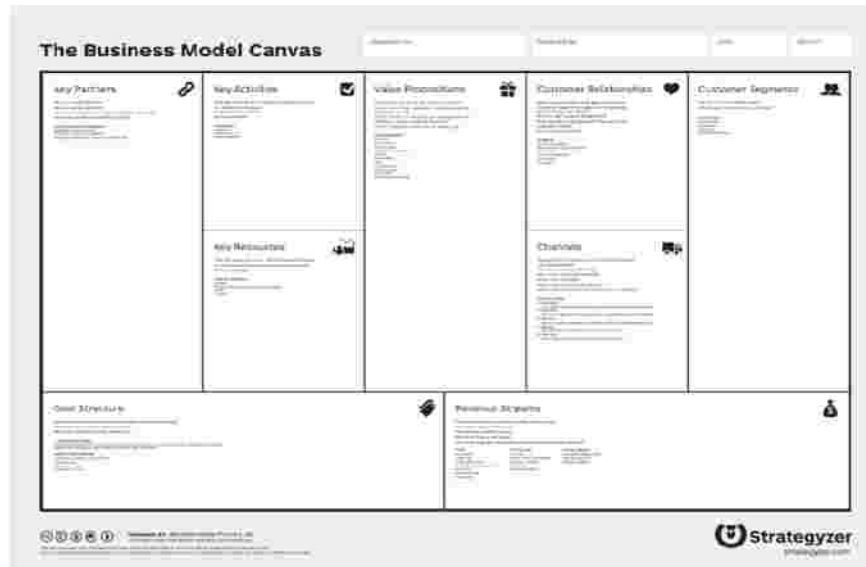


Figure 1 Business Model Canvas by Osterwalder & Pigneur

1. Customer Segments; defines the different groups of people or organizations an enterprise aims to reach and serve.
2. Value Propositions; describes the bundle of products and services that create value for a specific Customer Segment.
3. Channels; describes how a company communicates with and reaches its Customer Segments to deliver a Value Proposition
4. Customer Relationships; describes the types of relationships a company establishes with specific Customer Segments
5. Revenue Streams; represents the cash a company generates from each Customer Segment (costs must be subtracted from revenues to create earnings)
6. Key Resources; describes the most important assets required to make a business model work
7. Key Activities; describes the most important things a company must do to make its business model work
8. Key Partnership; describes the network of suppliers and partners that make the business model work.
9. Cost Structure; describes all costs incurred to operate a business model.

Root Cause Analysis

Root cause is a class problem solving methods aimed at identifying the root causes of problems or events and resolve the problem has been identified and the RCA process should not be delayed until a problem becomes too large and unwieldy (Bestefield, 1995).

There are lot of root cause analysis types in use today, but only three types of root causes analysis is commonly used:

1. Fish bone diagram: A fishbone diagram, which is also called an Ishikawa diagram, is a diagram used in quality control and product design. It is sometimes also referred to as a cause-and-effect diagram because it is designed to show the causes of specific events.

2. Current reality tree: a method for determining the root problems that affect the quality of the output of a business process. In a current reality tree, the worst thing that happened or almost happened is placed at the top. If the error did occur, the current reality tree does not have prevention or recovery side.
3. Anova: anova is analysis of variance. It is the statistical technique for determining the degree of difference or similarity between two or more groups of data. It will determine the problem based on statistic calculation.

1. Research Method

Company Visit

The initial step to do is visit the company. The purpose is to ask permission to the owner and to make an appointment in order to do research in the company. This step is very important to get closer to the owner, so it will make author easier to collect the data, either through direct interview or collect from secondary data.

Problem Identification

In this phase is to formulate a problem that occurs in KMC that related to production capacity. After some interview with the owner, the author can identify problems that are occurring and assessing information in KMC, which will be the topic of this research. Problem to be addressed is production capacity of mocaf flour production, because mocaf flour is main product of KMC and will determine the revenue of the company. Problem happen when KMC cannot fulfill customer demand because of production capacity is too small, therefore they do not have backup plan this makes their inventory stock running low and they must deal with lost sales.

Literature Review

Literature review takes a very important role in doing this research, especially in processing and analyzing data. Therefore, to support this research, the author will take some of theoretical basis from book, journal, and web. There are several book that author used, for instance Operation Management, Supply Chain Management and Principles of Management Finance. In addition, author also applies some journal and data from the internet that may be related to production capacity.

Data Collection

All required data and information need to be collected and processed to solve the problem. The data and information are collected from primary source and secondary source. The primary data come from interview with related employees; meanwhile the secondary data come from company's document. Primary data aims to be able to know the current production capacity, business process, supply and demand of product and any other information that relevant to problem faced by KMC. After collecting all related data, then it will be processed by using the appropriate method.

Data Analysis

After gathered all the data, the next step is to analyze the data. It starts from analyze the business model of the company and find the root cause of the problem that faced by KMC. Then, make a solution map to solve the problem. In this case there are several solutions to deal to increase company performance and production capacity; the calculation of consequences of each alternative is done. Based on the consequences, a comparison among all the alternatives will be conducted to select the best alternative to be implemented.

Conclusion and Recommendation

In this phase all data and information are being summarized in order to give readers understanding of basic information from this research, such as data analysis and recommendation for company to improve its performance. In this section the company is given the most appropriate solution to solve their related problem in order to increase company performance and to improve production capacity.

Business Model Analysis

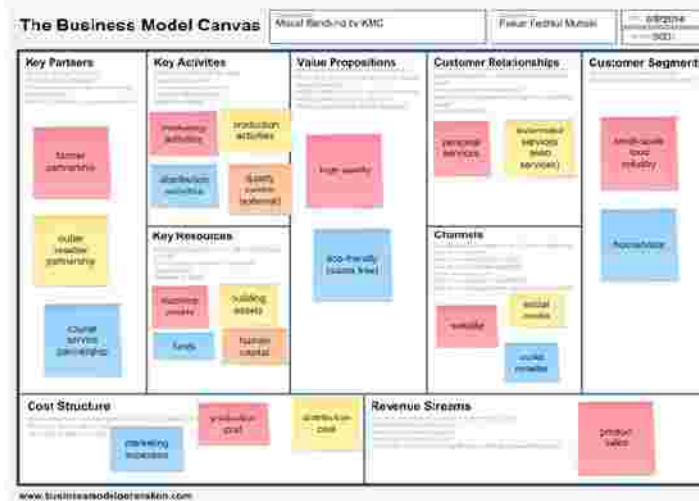


Figure 2 Business Model Canvas of Mocaflour Product by KMC

- a. Customer segments

The customer segments for mocaflour products by KMC mainly are households and small-scale food industry or home industry. KMC's production capacity is still too small so they cannot reach another customer segment or enlarge their market share. It caused by the production quantity is low.
- b. Value propositions

The value propositions by KMC for its customer is to deliver high quality product that has passed several quality accreditation and waste-free production process. KMC always uphold the hygiene of the product, so they kept the product fresh and hygiene until the end customer. KMC has several accreditation and certification. Some of them are Halal Certification from Majelis Ulama Indonesia, Pangan Industri Rumah Tangga (PIRT) from Departemen Kesehatan Republik Indonesia and the product has passed the test by Badan Pengawas Obat dan Makanan.
- c. Channels

To reach the customer KMC uses several channels from physically build to online media, such as website, Facebook and reseller outlet. It is intended to keep abreast of people life style. They tend to use communication technology because it's simpler and practice. The reseller that has sold mocaflour by KMC are Ny.Liem, Origin, Papaya, Kijang Mas and Total Buah.
- d. Customer relationship

KMC has call center for personal assistance and website for automated services. The call center is use for customer order and customer service. The website is to provide the customer information about the product. For now the customer service and customer order are handled by the owner herself. Website admin is handled by the marketing team.
- e. Revenue streams

KMC has only one product there is mocaflour labelled Mocaflour Bandung. The entire revenue stream for KMC is gained from the mocaflour products sales.
- f. Key resources

The key resources in KMC are divided into several aspects. There are assets, humans and financial. For the assets KMC has building plant and machines for production. In the human aspects KMC has main worker in factory mill as operator and outsourcing worker, and some marketing team. In financial aspect KMC has cash and capital.
- g. Key activities

Key activities in KMC are starts from marketing activities such as promotions and packaging design, production activities, distribution activities from the factory to the end customer and quality control management to ensure the product is safe for consumption.

h. Key partnership

KMC has several partners who have been and will continue supporting KMC, there are cassava farmers to support the raw material, outlet reseller to provide place to sell the product, and courier and cargo service to deliver the mocaf product to customer.

i. Cost structure

The cost structure consisted from production cost, distribution cost and marketing expenses. In the production is divided into variable cost and fix cost. The variable cost is depending on the production process and output. Fix cost is obtained from worker's salary.

Data Analysis

Analysis of Current Business Situation

During mid-year of 2014 the current production capacity of Karunia Maha Cipta factory cannot fulfill the order from new market segment. Mainly the existing target market of Mocaf Bandung product is home industry but as increasing of customer awareness about healthy product and healthy food the customer also switch their habit to be healthier. With those conditions, big-scale food industry tries to reach the market with healthy food too. Several food industries has offer Karunia Maha Cipta to make Mocaf Bandung as their raw material. Unfortunately the current production capacity of the factory cannot fulfill the demand offered. The contract offered needs 75 – 150 tons of mocaf flour each month, very unfortunate the existing production of Karunia Maha Cipta only 4 tons a month. This is very far away from the contract offered; to refuse the contract makes companies miss opportunities to increase revenue. With current business situation make Karunia Maha Cipta realize they have to improve their production capacity to expand their distribution network and market.

To improve production capacity, Karunia Maha Cipta has targeted to expand their factory in Ciamis, West Java. The available location for factory in Ciamis is around 20 hectares with expectations can improve the production up to 100%. Beside that the company has near supplier location in Ciamis so the transportation cost will cheaper and the qualities can be more guaranteed.

Company Operational Facilities

In Karunia Maha Cipta, the mocaf flour production schedule takes 5 days a week from Monday to Friday. The main raw material for the production is fresh cassava. The cassava gained from farmer in Subang. The cassava shipment takes 2 times a week on Monday and Wednesday to factory in Lembang. For each shipment it carries 2000 kg of fresh cassava (gross weight). For one cycle production of mocaf needed 1000 kg of fresh cassava to make 250 kg mocaf (4:1). So, the production process in one week has 4 cycles production and 16 cycles for month. Each cycle needs 1000 kg of cassava.

The total production output of mocaf flour in one cycle can produce up to 250 kg; this means in a month KMC can produce 4000 kg. Furthermore it can be called as Design Capacity because it's calculated by maximum theoretical output of a system in a given period under ideal conditions.

Product Availability

The bookkeeping system in KMC is not according to the standard yet. They calculate their product availability based on inventory system in warehouse monthly. For now KMC didn't use any forecasting method to anticipate market demand. KMC mainly keep their safety stock around 500 kg in inventory.

Table 1 Mocaf Production in kg

Month	Production	Inventory	Product In-stock	Product Sold
July 2014	2,260	40	2,522	2,482
June 2014	2,980	262	3,547	3,285
May 2014	2800	567	3,252	2,685
April 2014	2,986	452	3,320	2,868
March 2014	2,870	334	3,080	2,746

From the data above can be mentioned the existing production capacity still can fulfill the demand. But, the product in-stock quantity is decreasing based on data in July, it's because the production machine is broken and still under repairment. This make the production suspend and also the raw material shipment stop for a while. To fulfil the demand while the production suspend, KMC use safety stock available in inventory. While the demand kept coming makes the inventory stocks are running low. This gradually will make KMC suffered product stock out and causing lost sales.

Production Process

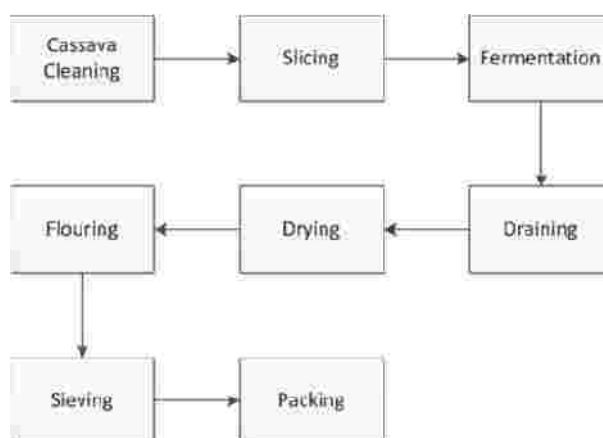


Figure 3 Mocaf Production Process

This is the mocaf flour production process in general as displayed in Figure 3. In KMC, for one cycle production needs 1000 kg of cassava. After cleaning process total amount of cassava reduce to 800 kg due to skin peeling, dirt and root cleaning. So the total net weight for production is 800 kg. The ratio of cassava per mocaf flour is 4:1, it means with 800 kg cassava can produce 200 kg of mocaf flour. Total time needed in mocaf production for one cycle is 43.96 hours and take 2 working days based on table 4.1-4. All the production process has been done by 4 main worker as machine operator and 6 outsourcing worker for cassava cleaning process.

Root Cause Analysis

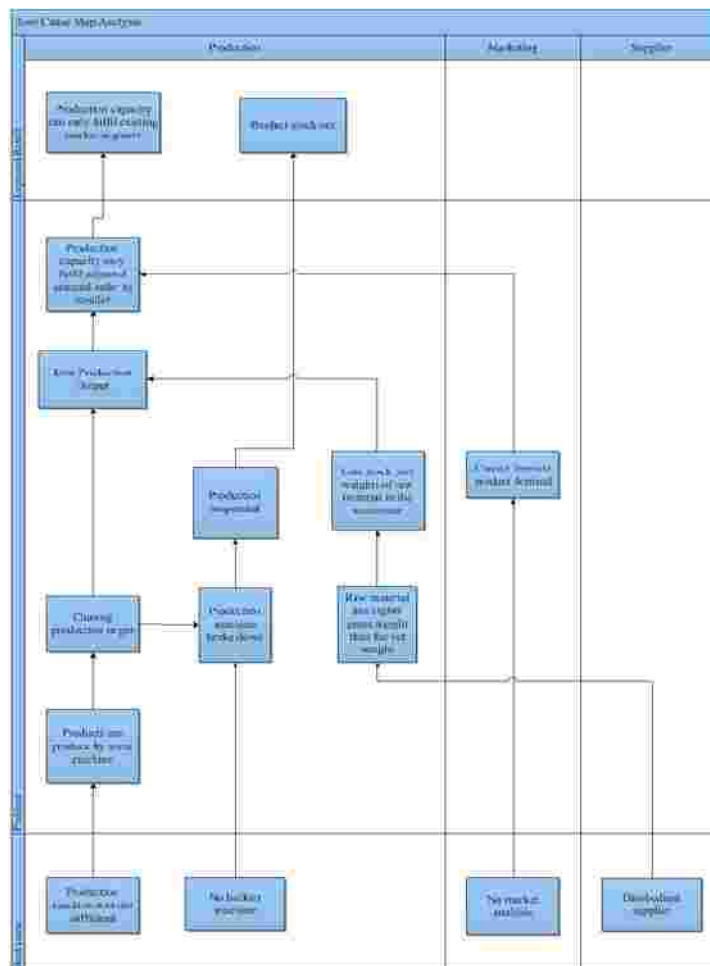


Figure 4 Root Cause Map Analysis

Figure 4 shows analysis map of root cause that happen in KMC. In general, the root cause has been created to identify the actual problem that occurred in KMC. It can be seen that the problems focused on the production capacity that can only fulfill adjusted demand order to reseller. In addition, the suspended production also became a problem. The production output from current production is too small. It shows that KMC can only fulfill the demand from existed market (households and small-scale food industry). With this condition KMC cannot enlarge their market segment of the product. After explaining the root cause in general, a detailed explanation related to root cause above will be explained below:

a. Production machine was not sufficient

The most important process in producing mocaf flour is drying process. In this process the fermented cassava chips will be dried by oven machine. The existing oven machine capacity is 800 kg and the production process within the machine is 8 hours. Oven machine is main or central machine process in mocaf flour production, because the other process can be done manually or not too rely on machine. If the drying system done manually using sun light, it will take 2 days to dry the whole cassava chips. Moreover the hygiene of the product cannot be guaranteed. It caused by the air pollution in outdoor area when drying the chips. If the chips dried using sun light, the pulp not entirely dried up sometimes there is dark spot on the edge of drying area it means the product still has high water content. Drying process or oven

machine thus can be bottleneck of the production process, because this process is the longest process or important aspect in the production process.

b. No backup machine

The company doesn't have backup machine or spare part for the production system. Flour can be called as food product; the production system must be done sequentially. If the production has been started the production output from each stage must be directly continued to next stage, because if don't the product will be expired and it causing losses. So if the one machine broke down it will affect and delay the entire production system. Moreover, if the oven machine broke down the drying process will be suspended and the product cannot be continued to next stage. This will suspend the entire production system and the production output cannot be determined. When this condition happens there will be stock out for the product.

c. Disobedient supplier

The supplier always good at first order and shipment but after several months of raw material shipment the supplier start to reduce the net weight of the fresh cassava supply. They usually put more dirt and leaves of the cassava in the shipment. Basically all type of cassava can be produced to make mocaf flour even though poisoned cassava, because in mocaf production has fermentation process. In this fermentation process the dangerous substances from the cassava will be catalyzed with the enzyme. Sometimes the cassava size is irregular with the standard. Perhaps with these condition makes the supplier more freely to put all kind of cassava in their shipments. If this observed further, the quality and production quantity will changes because of different type of raw material. Size of cassava also needs to be considered if it too big or too small for the machine it will make the efficiency of the machine decrease and put more effort to produce.

d. No market analysis

So far KMC just waiting for the information from the reseller about the product availability, they not do active communication. This make the company cannot analyze the actual market demand. In addition, KMC cannot get some customer feedback from their customer about the product.

Proposed Solution

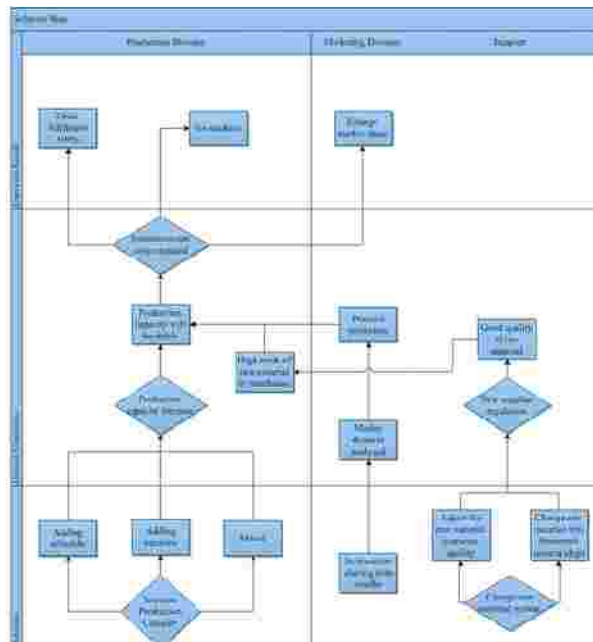


Figure 5 Solution Map

From the solution map above, it can be seen that there are three possible solutions proposed to KMC. Every proposed solution gives an effect. The desired effect is done to see the correlation of each solution to achieve the expected result. Three work divisions involved in the solution map, there are production division, marketing division, and supplier. However, from three solutions that have been proposed, the company expects increase in production capacity to enlarge the market share. After explaining the solution map generally, a detailed explanation about solution map above will be explained below:

Increase Production Capacity

a. Through Adding More Schedule

This alternative is to increase current production capacity by adding more schedules. This alternative is can be applied for short term and no need for initial investment. To increase the production capacity the working schedule is increased to 6 days per week or 24 days per month. Total operational cost for a month is Rp 37,087,500.00 or for one year will be cost Rp 445,050,000.00. The operational cost will be same each year. On average KMC can produce mocaf up to 4000 kg/month. The average production output for mocaf product is 48,000 kg/year. With mocaf price sold is Rp 10.000/kg, KMC can gain revenue up to Rp 480,000,000.00 per year on average production output. This alternative can improve current production capacity by 25% and increase the profit by 25%.

b. Through Purchasing New Machine

This alternative is to increase current production capacity by adding more machines. This alternative is to be applied in the long term. The target for this alternative is can improve current capacity by 160%, so the total production will be 8,320 kg per month. This alternative needs investment as much as Rp 129,000,000.00 and will be projected for 5 year investment. The production capacity will be increase gradually per year, in 1st year the production capacity will be 50%, in 2nd year the production capacity will be 75% and will reach 100% in 3rd year. Total operational cost in optimal capacity for a month is Rp 65,388,000 or for one year will be cost Rp 784,656,000. On average KMC can produce mocaf up to 8,320kg per month. With mocaf price sold around Rp 9,500/kg, KMC can gain revenue up to Rp 806,208,000.00 per year on average production output. This system has NPV as much as Rp 240,152,467.22 with IRR 20.50%, Net B/C 1.06 times and Payback Period 4.72 year. This alternative can improve current production capacity by 119% and increase the profit by 265%.

c. Mixed Through Purchasing New Machine and Adding More Schedule

This alternative is to increase current production capacity by adding more machines and schedule. The target for this alternative is can improve current capacity by 119%, so the total production will be 7,000 kg per month. This alternative needs investment as much as Rp 76,000,000.00 and will be projected for 5 year investment. The production capacity will be increase gradually per year, in 1st year the production capacity will be 75% and will increase to 100% in 2nd year. Total operational cost in optimal capacity for a month is Rp 57,987,500.00 or for one year will be cost Rp 695,850,000.00. The average production output for mocaf product is 6,650 kg/month or 79,800 kg/year. With mocaf price sold is Rp 9.500/kg, KMC can gain revenue up to Rp 758,100,000.00 per year on average. This system can gain NPV as much as Rp 210,372,695.54 with IRR 48.73%, Net B/C 1.96 times and payback period 2.72 years. This alternative can improve current production capacity by 119% and increase the profit by 265%.

Table 2 Production Alternative Comparison Table

Criteria	Current	Alternative A	Alternative C	Alternative B	Unit
Production Output	3,200	4,000	7,000	8,320	kg
Production Improvement		25%	119%	160%	%
Production Cycle	16	20	20	16	Cycle

Production Cost	29,670,000.00	37,087,500.00	57,987,500.00	65,388,000.00	Rp
Revenue	32,000,000.00	40,000,000.00	66,500,000.00	79,040,000.00	Rp
Profit	2,330,000.00	2,912,500.00	8,512,500.00	13,652,000.00	Rp
Profit Improvement		25%	265%	486%	%
Investment		-	76,000,000.00	129,000,000.00	Rp
NPV		-	210,372,695.54	240,152,467.22	Rp
IRR		-	49%	21%	%
Net B/C Ratio		-	1.96	1.06	
PBP		-	2.72	4.72	year

New Raw Material System

a. Change the Type of Cassava

KMC must use cassava that has high starch content on the market and the size must accordance with the production machine. All of the cassava type must same in each shipment. So the quality will be equal in each production. The type of cassava that has cultivated in West Java is Manggu and Gajah. These two varieties of cassava is a kind of superior and have high starch content. This is very common alternative and cost for this alternative is not too high, because the calculation is based on raw material (cassava) ordered for production. With high quantity of cassava ordered can decrease the price. The calculation is already included in variable cost of operational cost in each alternative.

b. Change Raw Material to Fermented Cassava Chips

This alternative is to change the raw material from fresh cassava into fermented cassava chips. So the production process will be shortened and KMC can decrease their outsourcing worker. If KMC using cassava as raw material they will buy the gross weight of the cassava but if they use fermented cassava chips they will buy the net weight. For now only several farmer that produce fermented cassava chips because there are only few mocaf producer and the market still rare. This alternate system can be realized by introducing the farmer about mocaf product. So the farmer will more encourage producing mocaf. KMC must educate the farmer by providing counseling about the fermentation process so the farmer will implement it by himself. In this alternative the farmer will be supplier of fermented cassava chips for KMC as collector.

Information Sharing With Reseller

To gain information about the market condition and to get the actual demand of the products, KMC must have information from their reseller. The reseller has direct contact with the customer. From this situation KMC can get some information such as actual demand of the product and customer feedback. KMC must concern about the customer feedback to gain customer satisfaction about their product. In this solution KMC must active to gain information such as make a phone call or ask about the product availability in the reseller per week or twice a week. So KMC can monitor the product availability in the reseller level. After the actual demand already known, KMC can make sales forecast to anticipate the upcoming periods. With this way KMC can avoid losing sales by out of stock product in reseller level. Beside that with customer feedback KMC can improve their product quality based on the desired from customer.

2. Recommendation and Conclusion

2.1 Recommendation

Based on the comparison in table 2, the best alternative to increasing the production capacity is alternative C: mixed alternatives through purchasing new machine and adding more schedules. The recommendation for KMC is take the option to increase the production capacity by mixed alternative, change the type of cassava and do information sharing with reseller. These recommendations must be done simultaneously because this step is related to each other.

New Business Model

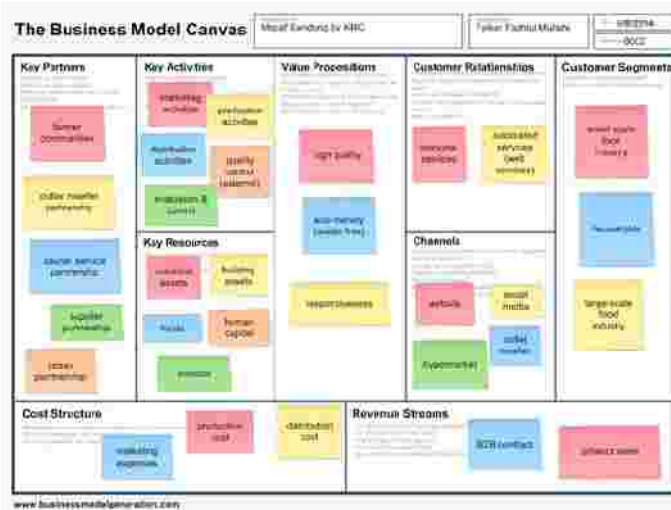


Figure 6 New Business Model for KMC

a. Customer Segments

In customer segments block KMC has new customer segments there is large-scale food industry which previously only had two customer segments (small scale industry and households). It is because they have increase the production capacity so the production output quantity will increase from previous business model.

b. Value Propositions

In previous business model, the value which KMC deliver is high quality product that has passed several quality accreditation and waste-free production process. In the new system, they have increase new capacity and the product availability more guaranteed. It makes KMC more responsive to meet customer demand. The next steps KMC can use push strategy to the market if demand uncertainty not high.

c. Channels

In Channels block KMC has new media there is hypermarket stores, with the increasing of production stock of mocaf flour it hopes KMC can supply to hypermarket store such as Carrefour, because almost 70% of Carrefour suppliers are UMKM (Usaha Mikro Kecil dan Menengah). This will expand the market network in previous business model, which the product only sold through outlet resellers before.

d. Customer Relationships

In new business model there is no significant change for customer relationship block, because in new system the company mainly reach the customer through third parties such as the reseller and hypermarket store.

e. Revenue Streams

In revenue streams block, the company has additional income there is B2B contract by the hypermarket and large-scale food industry. This makes the company have fix demand and income from this contract. So the total revenue streams are gained from product sales and B2B contract.

f. Key Resources

In key resources block KMC has new addition of assets and financial aspect. In assets aspect, KMC has new facility by purchasing new machine and building plant for production. In financial aspect KMC has investor to fund the company. Due to the new system production makes the company cash flow become better, it will gain interest for investor to invest in the company. In addition, the market shares for mocaf industry still open and large.

g. Key Activities

In previous business model the key activities in KMC are starts from marketing activities such as promotions and packaging design, production activities, distribution activities from the factory to the end customer and quality control management to ensure the product is safe for consumption. In new system, there is a new activity for the owner and management to evaluate and control the new system implementation.

h. Key Partnerships

In this block KMC has cassava farmer communities as back-up supplier and for new raw material research (fermented cassava chips). The good from this community is if the research has significant result for KMC production process can make KMC not rely on cassava or the cassava supplier anymore. In addition, stores partnership can increase the mocaf flour sales and customer awareness about mocaf product because the stores also promoting the product.

i. Cost Structure

In cost structure block there is no significant change in production cost because there is now additional cost for production. So the cost structure still consists of marketing expense, production cost and distribution cost.

Table 3 Comparison between Existing System and Proposed System

No	Aspect	Existing System	Proposed System
1	Production	Current production capacity in KMC is 3,200 kg per month. All the production process is performed with the same machine in other words KMC does not have a backup machine for the production process. This makes the production system very risky because if one of the machines is damaged, the entire production process will be suspended. It will makes the product shortage in inventory because the demand is continues to come.	The existing production system in KMC is very risky. So for the proposed system is to increase the production KMC by adding more schedule and purchasing some new production machines. In the proposed system KMC can produce up to 7,000 kg per month. This is 119% production improvement from the existing system. The proposed system needs some investment as much as Rp 76,000,000.00 but it will be recovered in 2.72 year. Moreover with the new expansion plan in Ciamis, the expectation that the production capacity will be 2 times bigger than the current factory in Lembang.
2	Market Segments	The existing production capacity is too small so KMC can only reach several customer segments, such as households and small-scale food industry. This condition makes KMC's market share relatively small.	New production capacity increase the production output of the product. With the new capacity KMC can reach new market segment and increase their market share. In the long term with continues improvement KMC can be market leader for mocaf product in West Java.
3	Value Propositions	The value which KMC deliver is high quality product that has passed several quality accreditation and waste-free production process.	The increase in production capacity makes KMC more responsive to meet the customer demand and they keep maintain the previous values.
4	Channels	In existing system the channels	To reach new market segments with

		which KMC use to reach the customer are through website, social media and outlet reseller.	the increasing production capacity, KMC has new channels there is hypermarket store. This new channel can support the promotion process because it has wider scope of customer.
5	Profit	The profit is calculated by multiply the production output with product price minus the production cost. In a year profit gained by KMC is Rp 27,960,000.00. KMC still in the introduction stage so that the profit generated is relatively small.	In the proposed system based on new production capacity the profit generated by KMC also increasing. Compared to existing system the profit generated has very significant change about Rp 74,190,000.00
6	Key Resources	The stakeholders in KMC mainly the party whom related with production process and internal company. On the other side, the main assets in KMC are divided into facilities such as building and machine, and capital funds.	In new system with the increase of production capacity, KMC need some investment. To fund the new system KMC has new stakeholders there is investor and banks. To support the new system KMC has bigger portion of assets than existing system. The assets account still same but in higher portion.
7	Key Activities	The main key activities in KMC are production process and its supported activities. Starts from marketing activities, distribution and product quality control.	To ensure the stability of the new system, the top management must do evaluation and control to improve the current productivity and make continues improvement. These activities can make KMC sustain in the business.
8	Key Partnership	Current system only uses several partnerships to support its business activities. It starts from supplier partnership, reseller partnership and product sales.	The new regulations system for raw material supply makes KMC has new key partnership. The new partnerships are farmer communities to support new raw material and stores partnership to support product sales.

Risk Analysis

This analysis is contained the risks which will be faced when implementing new system. These risks covering all aspects related to the performance of the company and the business model. It starts from quality management, production stability, raw material supply, etc. The detail of these risks will be explained below:

a. Quality management

The bigger production output sometimes makes the goods quality not maintained. This can be avoided by actively maintaining quality control and checking of the production in each batch. If necessary, KMC can conduct lab tests to know the composition of the product and its level exactly. So that KMC can determine the upper and lower levels of production quality.

b. Raw material supply

The lack of raw materials stock can disrupt the production process. To respond to this KMC must have a warehouse to store raw material with a safety stock that is able to provide for the production of up to 10 cycles. In addition, it is also able to anticipate the rise in raw material prices.

c. Production stability

The increasing demand and the amount of production output, can lead the production systems overwhelmed that causes to the cessation of production process due to a broken machine. It required good maintenance process for treating the production machine, so the machine damage can be avoided.

d. Reseller relationship

To avoid unruly behavior supplier, KMC must exercise control over the products sold in the reseller. In other words, the supplier must be willing also to maintain the quality and reputation of the product KMC. This can be done by application of the SOPs to the products treatments and reseller system itself.

e. Supplier loyalty

Sometimes there is competitor or another industry who took our suppliers by offer with higher purchase price. To anticipate this KMC must make a MOU which will binding both parties and based on law. So the suppliers cannot switch to another company. To increase the supplier's loyalty KMC must educate the suppliers or farmer about the cassava cultivation. This make the supplier or farmer motivated to be better and loyal to the company.

f. Competitor

Competitors are very influential to the condition of the company. This competitor could come from another industry or similar industry. This could make the company could be better or vice versa. To anticipate the threat from competitor, KMC should do internal and external analysis also SWOT analysis. By done this analysis KMC can make appropriate strategic management to compete with the competitors.

g. Increase cost

National and global economic conditions can lead the increasing cost that related to the production process of mocaf flour. If the production cost increase it can decrease the revenue gained by KMC. To reduce the impact KMC must utilizing all available data such as forecast demand projection, product supply data and all related cost. So KMC can adjust the production output using economist of scale theory.

h. Fraud

Fraud can be happen in internal company level which in the end will make the company lose. This type of fraud can be happen in order purchase, production process, raw material order, etc. The actions that can be done to anticipate this problem is by controlling from top management. The controlling must be done in a structured and scheduled process. In example; by cross checking the customer payment with the product sales and cash in, if there is incongruity in the data the company can know who is the responsible. The business issue in this case is about the product availability and the market demand. Demand for mocaf flour already existed but the supply is very limited, it is because there are only a few mocaf flour producers in Indonesia. Therefore this is a good opportunity for KMC to increase their production capacity and increasing their market share to become market leader in mocaf flour industry.

Conclusions

The root causes that had been identified were the production machine was not sufficient, no market analysis and disobedient of raw material supplier. To overcome the emerging root causes, several possible solutions were made by using the solutions map. The possible solutions that have been made are: increasing production capacity, new raw material system and information sharing with reseller. All of the solution found not only to increase the production capacity, but also leads to final condition: increasing sales and enlarge market share.

The business solutions were analyzed under capital budgeting method such as Net Present Value, Internal Rate of Return, Net Benefit/Cost Ratio and Payback Period. From the calculation

results showed that the best solution to increase the production capacity is mixed alternative by purchasing some new machine and adding more production schedule. The purposed solution scenarios are predicted to increase the production capacity 119%. With continues improvement the company can enlarge the market share and decrease the product price to be more competitive.

Further research is required to improve the company's performance and to minimize operational cost. This can be done start with demand forecasting using appropriate method and compare it with the actual demand. Then choose the best method that has minimal forecast error. This action can anticipate the market condition which sometimes makes demand goes up or down. With this method the company can do aggregate planning to adjust the production based on production capacity and demand. It will affect the operational cost because the company can minimize raw material order, control inventory on stock and can take advantage of economies of scale. The further research also required to research other factors which affect the production system and to evaluate the new business model for mocaf flour products. The research must be more detail about capacity planning such as for capacity plant map, it is intended to provide base of production process so the productivity and efficiency will increase. Further research about risk analysis should be done also. It is about the risk assessment and mitigation. The risk assessment is to know the extent to which these risks will have an impact on companies with the existing systems. The final goal of the risk analysis is to find the solution to cover the risk, and then it can be called as risk mitigation. This case study is also performed in limited area; therefore further research could perform in larger area and various aspects.

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