UNIVERSITAS INDONESIA

FEASIBILITY STUDY OF NEW FACTORY EXPANSION IN TERM OF MARKETING AND FINANCIAL ANALYSIS AT PT KANSAI PAINT INDONESIA CIBITUNG

THESIS

Submitted to fulfill one of the requirements to obtain degree of Magister Management

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STATEMENT OF ORIGINALITY

This final paper represents my own effort,

any idea or excerpt from other writers in this final paper, either in form of publication or in other form of publication, if any, have been acknowledged in this paper in accordance to the academic standard or reference procedures

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Telah berhasil dipertahankan di hadapan Dewan Penguji dan diterima sebagai bagian persyaratan yang diperlukan untuk memperoleh gelar Magister Management pada Program Studi Magister Management – Master of Business Administration, Fakultas Ekonomi, Universitas Indonesia.

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PREFACE

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Jakarta,1 December 2010

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ABSTRACT

Name : Cheppy Tri Martanto
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Title : Feasibility Study of New Factory Expansion in Term of Marketing and Financial Analysis at PT. Kansai Paint Indonesia Cibitung.

The purpose of this thesis is to analyze feasibility study based on marketing and financial analysis of new factory for resin product at PT. Kansai Paint Indonesia. In order to fulfil the order and to reduce cost for raw material that always imported from Thailand and Japan, PT. Kansai Paint would expanding to build new resin factory to produce for about 500 tons per/month.This thesis examines the profitability in commencing the expansion of new factory for resin product and the feasibility of the business through the use of financial tools namely Payback Period, Profitability Index, Net Present Value (NPV) and Internal Rate of Return (IRR). Criterion for a project to be accepted is where Net Present Value is positive, Internal Rate of Return exceeds the cost of capital and Profitability Index exceeds 1.The project has result positive Net Present Value as Rp. 3.798.620.000, 00 Internal Rate of Return (IRR) as 35 % , which is exceed the cost of capital; Profitability Index exceeding to 1 as 4.15 ; Payback period is 2.11 years which is less than the period of project 10 years. The marketing mix strategy used to serve PT. Kansai Paint Indonesia target market by focusing primarily on the buyer that adapted by combination between the 4Ps and 4Cs model, where 4Ps is a product – centric approach while 4Cs is customer – centric approach.

Keywords: Feasibility Study, Financial Analysis, Marketing Analysis

ABSTRAK

Nama : Cheppy Tri Martanto
Konsentrasi : MM-MBA

Judul : Studi Kelayakan Dari Pembangunan Pabrik Baru dengan menggunakan analisa Pemasaran dan analisa Keuangan di PT.Kansai Paint Indonesia Cibitung

Tujuan dari thesis ini adalah untuk study kelayakan bisnis berdasarkan analisa keuangan dan pemasaran di pabrik penghasil resin pada PT. Kansai Paint Indonesia. Dalam rangka untuk memenuhi permintaan dan mengurangi biaya bahan material yang selalu didapat melalui impor dari Thailand dan Jepang, PT. Kansai Paint akan membangun gedung baru yang akan digunakan sebagai pabrik pengolahan resin yang dapat memproduksi resin sekitar 500 ton/bulan. Tesis ini menganalisa keuntungan dan kelayakan bisnis yang didapat dari pembangunan dan ekspansi pabrik baru yang memproduksi resin dengan menggunakan analisa keuangan Payback Period, Profitability Index, Net Present Value, dan Internal Rate Return. Kriteria agar proyek ekspansi ini dapat dilanjutkan apabila NPV bernilai positif, Internal Rate of Return sama dengan nilai Cost of Capital, Proyek ini telah menghasilkan Net Present Value positif sebesar Rp. 3.798.620.000, 00 Internal Rate of Return (IRR) sebesar 35%, yang melebihi biaya modal; Profitability Index melebihi 1 sebesar 4,15; Payback periode adalah 2,11 tahun yang kurang dari jangka waktu proyek selama 10 tahun. Strategi pemasaran yang digunakan untuk melayani target pasar PT. Kansai Paint Indonesia dengan fokus utama pada pembeli yang disesuaikan dengan kombinasi antara 4P dan 4Cs model, dimana 4P adalah produk - pendekatan sentris sementara 4Cs adalah pelanggan - pendekatan sentries.

Kata kunci: Study Kelayakan, analisa keuangan, analisa pemasaran.

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INTRODUCTION

1.1 Background

The development of Indonesian automotives industry nowadays in 2010 is tent to be increasing. Even the impact of the global financial crisis that struck in 2008 has affected the performance of the country's automotive industry especially in 2009. Based on a report from the Association of Indonesian Motor Vehicle Industries (Gaikindo), car production and sales in 2009 dropped from the previous year. The production shrank to 464,815 units in 2009 from 600,628 units in 2008 or a decline of 22.6%.

Meanwhile, sales fell 19.9% from 603,774 units in 2008 to 483,548 units in 2009 although exceeding the target set by Gaikindo of 453,000 units. Sales in 2008 were the highest in five years. The decline followed the falling value of the rupiah that resulted in an increase in prices. The price hikes forced consumers to postpone plan to purchase new cars. In addition, high interest rate set by banks and financing firms as a result of the global financial woes discouraged people from buying new cars. However, sales of some Japanese major brands like Toyota, Daihatsu and Mitsubishi grew in 2009. Meanwhile, exports also dropped contributing to the decline in total sales of cars in 2009. Exports of cars in completely built-up (CBU) form totaled 56,669 units in 2009 or down 43.8% from 100,982 units in the previous year, as seen in figure 1.1.

The Indonesian car production hit an all time record at 600,628 units in 2008, exceeding previous record of 500,710 units in 2005. Growing demand and favorable economic condition contributed to the increase in production in 2008. In 2009, car production plunged 22.6% to 464,816 units on weak demand following the global financial crisis. In 2009, car assembling plants operated only at 53.5% of their capacity. Declines were recorded in the production of virtually all categories.

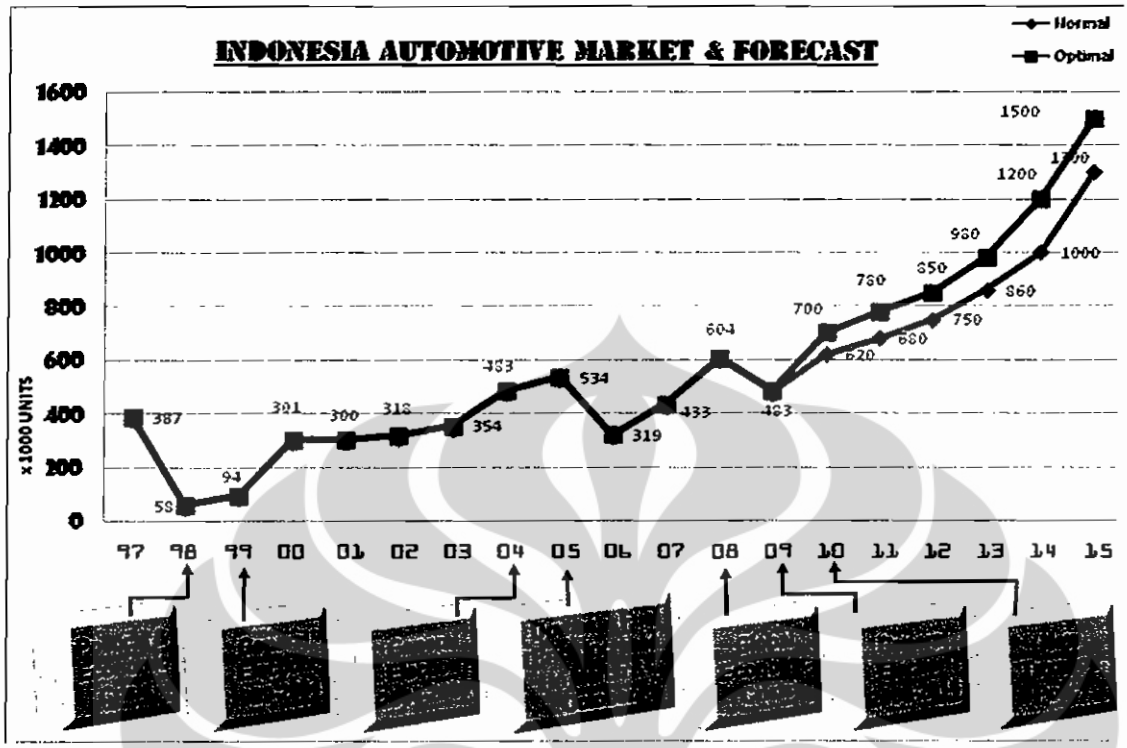


Figure 1.1.Indonesia Automotive Market & Forecast in 2010

Source: www.gaikindo.com

In 2010, the car market began to revive to follow the world's economic trend which is heading toward recovery. The country's auto industry, ATPM and other sub industry such as parts and paint supplier however, will face new challenge in 2010 with the implementation of the ASEAN China Free Trade Area (ACFTA), which became effect on 1 January 2010.

PT. Kansai Paint Indonesia as one of the supplier in Japanese automotives industry is urged to can full fill the demands of coating purposed by the automotives product, which the conditioned as mention before. Located in MM2100 Industrial Town Cibitung Bekasi with the area 30.000 m^2, PT. Kansai Paint is divided its area by three buildings used. Two used for production area, and one building used as technical R&D and marketing welfare. With the Finish good area located in back yard, the company is already expand its land area by invest for expansion planning in the future.

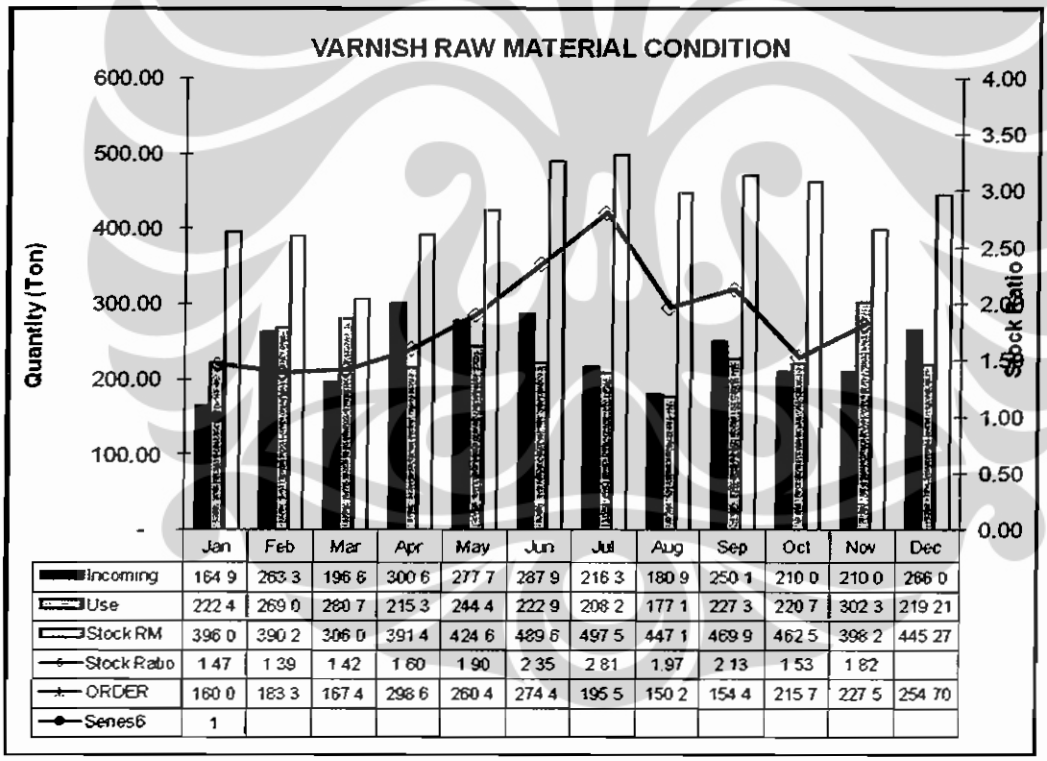
The company is a Multi National Company with principle of PT. Kansai Paint co,ltd, which almost 75% of the raw materials are imported from other

country such as Japan and Thailand. One of important factor that enough have an effect to coating industry is raw material problem. Nevertheless unhappily until now its raw material imported are in US Dollar currency, so for cost needed is higher. Cost of production would be reduced if this materials is not imported, even can be made in-house by the company itself.

Raw Material used for automotives paint coatings are as described below:

a. Synthetic Resin → Used about 75 ~ 80% from basic formula
b. Pigment → Used about 15 ~ 20% from basic formula
c. Solvent → Used about 10 ~ 15% from basic formula
d. Additive → Used about 5 ~ 10% from basic formula.

Raw materials imported from other country are high cost expenses for the company and its need a space of warehouse to keep it.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Incoming	164 9	263 3	196 6	300 6	277 7	287 9	216 3	180 9	250 1	210 0	210 0	266 0
Use	222 4	269 0	280 7	215 3	244 4	222 9	208 2	177 1	227 3	220 7	302 3	219 21
Stock RM	396 0	390 2	306 0	391 4	424 6	489 6	497 5	447 1	469 9	462 5	398 2	445 27
Stock Ratio	1 47	1 39	1 42	1 60	1 90	2 35	2 81	1 97	2 13	1 53	1 82	
ORDER	160 0	183 3	167 4	298 6	260 4	274 4	195 5	150 2	154 4	215 7	227 5	254 70
Series6	1											

Figure 1.2.Resin Raw Material condition at PT. Kansai Paint Indonesia

Source: Production & PPIC Dept. 2009

The price of synthetic resin in the Asian markets has continued to climb to follow the trend of the price of its basic material. The price of material with the soaring price of crude oil that exceeds US$ 70 a barrel in August and September, 2006 would and up to the increasing price for the product. With the fact that there are few upstream petrochemical factories in ASEAN any change in the performance of one of the factories will have its effect on the prices of petrochemical products in this region?

In 2006, there was scarcity in the supply of synthetic resin material in Indonesia as two local producers Chandra Asri and Pertamina reduced their production as their factories underwent regular maintenance. As a result a number of synthetic resin producers in Indonesia were forced to increase imports which in turn caused a rise in the price of propylene in the Asian market.

Toward the end of 2006, the country's synthetic resin industry operated almost at full capacity. Production totaled 535,750 tons or more than 80% of the total capacity. The country's production capacity for synthetic resin has remained unchanged for more than 10 years. The availability of basic material is a factor determining development of the industry.

Petrochemical industry is a strategic industry. It requires technology and large investment. There are few companies having high level technology needed to develop petrochemical factory. Union Carbide Corp., Shell Chemical Co., BP Chemical are among the owners of the technology having involved in the development of petrochemical industry in Indonesia.

The Association of olefin and plastic industries (INAplas) and the government has agreed to put upstream and downstream resin industries in clusters depending on their relations with other industries. There are three clusters in the plan: Banten cluster for olefin industry Tuban cluster for aromatic industry Bontang cluster for methane industry

PT. Kansai Paint Indonesia production of coating product result for all finish good product reached 1000 tons/month for all product in recent year, linearly with the increasing of automotive industry in Indonesia. The company is needed to expand its capacity in raw material for its efficiency in cost reduction term to make higher profit in the future. With the needed of resin materials about

250 tons/ month, all the resin orders have been being still supported and manufactured in other country such as Japan and Thailand and delivered to the company in US $. This condition caused the high cost for raw material expenses.

In order to fulfil the order from customer and to reduce cost from imported resin from Japan and Thailand to Indonesia PT. Kansai Paint Indonesia has to expand its business by build a raw material factory in current production area. Raw material for PT. Kansai Paint Indonesia production is about 250 tons/month, and to be more efficient and profitable the new factory expansion would be produce minimum 500 tons/month. The product exceed could be sold to other coatings industry in local and international area.

In order to know the projection of this plan to be profitable or no, we need an analysis of the viability of this idea by conduct a business feasibility study to determine the viability this factory expansion for produce resin raw material. Additional information beside potential market aspect why we expand in current production area is to reduce investment cost because we have already land area to build the new factory. In this feasibility study, we focus in two parts, first one is marketing analysis (marketing strategy, possible market shares for new customers in coatings and other industry) and second one is financial analysis (investment, financial tools, production capacity and cost). (Behrens & Hawraneck, 1991).

1.2. Problem Definition

Base on background above, then problem formulation at this research shall be as how the business feasibility study of factory expansion based on marketing analysis and financial analysis? Why is expanding a new factory that produce raw material that usually imported is a good investment? The writer would analyze the feasibility for the project to be accepted or to be rejected based on the result of financial calculated analysis and marketing strategic analysis.

1.3. Objective

In this thesis, the objective is to examine the profitability in expansion new factory of synthetic resin for internal uses and also sell to other customer by analysing the feasibility of the business. Through the use of financial tools, calls

Payback Period, Profitability Index, Net Present Value (NPV) and Internal Rate of Return (IRR) and also Marketing strategy based on 4Cs and 4Ps analysis, which would be end up to a decision making of future investment project executed.

1.4. Methodology

The methods which will be applied in this thesis are the quantitative and qualitative method by making the analysis, doing the surveys as follows:

a. Literature Study

Data collecting uses this way is very useful to get input regarding information and knowledge that support this successful of business feasibility study. Library Research is also used as reference materials in conducting analysis and a basic plan of strategic decision implementation. Source of library research is text book, research data and internet.

b. Observation

Direct observation is also conducted to get more information, based on writer's experience in the industry.

c. Data Collection

It conducted by collecting data both primary data and also secondary data to involved department in the PT. Kansai Paint Indonesia. And then all the data will be analyzed and provided systematically.

1.5. Outline

Chapter 1: Introduction

This chapter will contains the background of why the writer decided to elaborate the issue based on the problem identification, the problem definition, goal of the study, methodology and the outlined.

Chapter 2: Theoretical Framework

This chapter will elaborate theories related with the discussion in the Thesis. Writer will explore more about the theory of feasibility study, Marketing strategy, capital budgeting, and sensitivity analysis.

Chapter 3: Organization Overview

In this chapter, the writer will describe generally about PT. Kansai Paint Indonesia background and how their business practice. Analysis about the company's new product and existing product also the market characteristic will be discussed in this chapter.

Chapter 4: Analyzing

In this chapter contain marketing strategy and analysis, financial calculation based on payback period, discounted payback period, Net Present Value (NPV) and Internal Rate of Return (IRR).

Chapter 5: Conclusion

Based on analysis and discussion in the previous chapters, writer will carry out the conclusion whether the new factory expansion feasible or not and also giving a recommendation to take a right decision for the company.

CHAPTER 2
THEORETICAL FRAMEWORK

2.1 Feasibility Study

There are many theories that related with feasibility study. In this research, the researcher among others describes theories of feasibility studies. A feasibility study is a tool for providing potential investors, promoters and financiers with the information required to decide whether to undertake an investment, and whether and how to finance such a project. A feasibility study should arrive at definitive conclusion on all the basic aspects of a project after consideration of various alternatives. These conclusions and any recommendations made with regard to decisions or actions required from parties involved in the project would have to be explained and supported by compelling evidence.

The feasibility study focuses on helping answer the essential question of "should we proceed with the proposed project idea?" All activities of the study are directed toward helping answer this question. Feasibility studies can be used in many ways but primarily focus on proposed business ventures.

The feasibility studies are also should deal with the following questions: Will the enterprise gain strategic advantages by operating more internationally, what advantages will it gain in particular (example: economic of scale in production), To what degree and in which fields does international competition pose a threat to the project, what will be the future extent of the advantage of the enterprise operating on a geographically limited field?

The result of feasibility is then a project whose background conditions and aims have been clearly defined in terms of its central objective and possible marketing strategies, the possible market shares that can be achieved, the corresponding production capacities, the plant location, existing raw materials, appropriate technology and mechanical equipment and, if required, an environment impact assessment

An engineer and others with a business idea should conduct a feasibility study to determine the viability of their idea before proceeding with the development of the business. Determining early that a business idea will not work saves time, money and heartache later. A feasible business venture is one where the business will generate adequate cash-flow and profits, withstand the risks it will encounter, remain viable in the long-term and meet the goals of the founders. The venture can be a new start-up business, the purchase of an existing business, an expansion of current business operations or a new enterprise for an existing business.

Behrens and Hawranek's (1991) opinion about feasibility study, "As far as the investor is concerned, the investment criterion overruling all other project-related business objectivities is the financial feasibility of an investment project". "To ensure the success of the feasibility study, it must be clearly understood how the project idea fits into the framework of general economic conditions and industrial development of the country concerned. The project should be described in detail and the sponsors identified, together with a presentation of the reasons for their interest in the project." (Behrens & Hawranek, 1991, p.59), that's way it is very important to prepare the project idea that can be accepted and suitable with the economic conditions of related country.

In this research, the rearmost analysis is broken further down to marketing and financial analyses. The marketing aspect analyses are the 4C's: company, context, customer and competitors and the 4P's: Product, Price, Place, Promotion. As one might suggest, the financial part utilizes the de facto financial tools, namely Payback Period, Discounted Payback Period, Net Present Value (NPV) and Rate of Return (IRR).

"The term marketing can be best explained as a market orientation of management with regards to business decision." (Behrens & Hawranek, 1991, p.59). Based on the theory, we can see that market orientation of investment and finance decisions would therefore imply that feasibility studies need to incorporate the design of a marketing concept, which should be based on proper marketing research.

Marketing phase can be characterized by the following four elements. They are: business philosophy, marketing research, marketing instruments, and marketing plan and budget.

a). *Business philosophy*: Marketing is above all a business philosophy that does not focus on products or production, but puts the problems, needs and desires of existing or potential consumer groups at the centre of the business activities of the firm. This requires that decision makers at all levels and in all functional areas of the enterprise will have to orient their thinking towards the market.

b). *Marketing Research:* well-planned and systematic market and market-related research is a precondition for market-oriented decision-making. On the basis of information obtained about the potential market as well as the human, production, and financial resources available for the project, marketing strategies are to be developed to ensure the achievement of the project objectives.

c). *Marketing instruments.* The successful implementation of marketing strategies requires shaping and influencing the market in a well-planned manner, using the necessary combination or mix of marketing instruments.

d). *Marketing plan and budget.* To achieve the marketing objectives it is necessary to determine the required measures or means and to prepare a plan of action on the basis of the findings of marketing research and using the marketing tools available.

2.2 Marketing Strategy Analysis

As this study is to make decision for the project is feasible or not, the marketing strategies should be conduct. The 4 C's analysis and 4P's analysis combined to be made a great decision making process.

2.2.1. Analyzing the 4Cs

A substantial amount of analysis of customers, competitors, and the company itself occurs before decisions made concerning specific components of the marketing program. This reflects our view that successful marketing management decisions usually rest on objective, detailed and evidence based understanding of the market and environmental context. The analysis necessary to provide the foundation for a good strategic marketing plan should focus on four elements of the overall environment that may influence a given strategy's appropriateness and ultimate success.

The 4 Cs should be used when performing a market assessment and background evaluation of the situation at hand, as context, company, customers, and competitors.

2.2.1.1 Context

Marketing could create needs, distinction between needs and wants helps put into perspective the charge that marketers create needs or that marketing makes people want things they don't need. Neither marketing nor any other single social force can create needs deriving from the biological and emotional imperatives of human nature. On the other hand, marketing activities and many other social forces do influence people's wants. Indeed, a major part of the marketer's job is to help develop an attractive product or service, then stimulate customers wants for it by convincing them it can satisfy one or more of their needs better than available alternatives.

2.2.1.2 Company

This analysis provides the foundation for good marketing strategy on company's own internal resources, capabilities and strategies. There are like as organization's mission/ objectives/ strategy, strengths and weaknesses, basis for competitive advantage, financial and other performance indicators, brand/product specifics.

2.2.1.3 Customer

This terms of market segmentation, targeting and positioning in marketing strategy are should be done because different people and organizations have different needs and seek different benefits, the entire global population is seldom a viable market for any single product or service. The market for a product category is usually fragmented into several distinct market segments. Each segment consists of people or organizations that are relatively similar in their wants and the benefits they seek. But each segment desires different benefits from the same product category.

The other things must be considered when developing an effective marketing strategy is how the position the firm's offering to the target segments. That is, what combination of product features, price and other marketing program variables will both appeal to the target customer and differentiate the company's offering from the competition.

2.2.1.4 Competitor Analysis

Marketers have developed numerous analytical frameworks, data collection methods and statistical tools to compete with the other competitor. We have advantage competitive than the other company and that is demonstrably superior to competitive offerings on one or more dimensions, as follows:

- A well designed package can help preserve the product's quality and increase customer convenience.
- A strong brand identity provides assurance of consistent quality and performance from purchase to purchase.
- Warranties and guarantees reduce the customer's financial risk.
- And customer services during and after the sale help to ensure that buyers receive full value from their purchase.

2.2.2 Analyzing 4Ps

Once we have analyzed the 4Cs and identified a target customer segment, the marketing task becomes of designing an offering that will provide the firm with a unique position within that target market. The proposal should meet the

potential customer's wants and preference and establish a sustainable advantage over competitors. Many of tactical decisions are involved in designing a marketing program to achieve such a position, but those decisions can be sorted into four broad categories of variables over which a manager has some degree of control in the short term. The controllable elements of a marketing program are often referred to as the 4Ps: Product, Price, Place and Promotion.

2.2.2.1 Product

A product can be described as anything that satisfies a want or need through use, consumption, or acquisition. Thus, products include objects, services, places, people, activities, and ideas. Conceptually, products should be thought as problem solvers since they are purchased because the core benefits they provide. A well-developed positioning statement or value position play an important role in designing products, whether goods or services. The decisions about features products to be made are typically by the consumer's criteria are limited to relatively few attributes or quality dimension for a given product category.

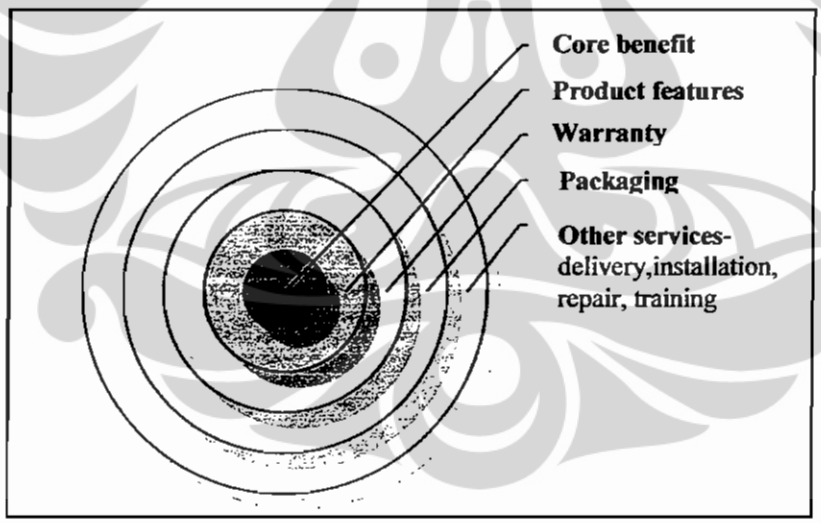


Figure 2.1.The Augmented Product Concept

Source: JW Mullins, OC Walker, HW Boyd (2008), Marketing Management, McGraw Hill companies Inc, New York

As seen on figure 2.1, the main idea of marketing phase is to designing products or services that delivers the services products, warranty, packaging also features and benefits that target customer's wants and that is demonstrably superior to competed offerings on one or more dimensions.

- The services for technical assistant for example could give the customer satisfaction and full value from their purchased product
- Warranties and guarantees could reduce the customer's financial risk.
- A good designed package of the products could increase customer convenience and satisfaction.
- Product features will provide the intended satisfaction better than competitive products.
- Benefits are the solution to the customer problems or need to be delivered by the products.

2.2.2.2 Pricing

The key concept in setting a price is the notion of perceived value. Whether the product offering is an industrial product or service that delivers primarily economic and functional benefits or a consumer item whose benefits are more psychological, potential customers usually have some idea of what constitutes a good or bad price. Many firms based their pricing decision to recover their costs or match competitor. There is clearly some justification for such an approach given that firms cannot price their products or service below cost – at least not for long.

While determining an appropriate price level for a product or service is a complicated process, most firms do not charge the same list price to every customer all of the time. Differential pricing occurs when the company sells a product at two or more prices not determined by proportional differences in cost. This is usually done to adjust to differences in the price sensitivities or preferences of various customer segments.

The perceived value of a given product offering can vary from customer to customer. When setting a price level within a strategic marketing program, however, the managers should try to determine an "average" perceived value for

the customer s in a particular target market segment. Such a determination typically requires research.

2.2.2.3 Place

The location of the company could make the decision making by customer. In Automotives industry which sometimes the production process in 24 hours, Just in Time delivery would be a crucial and important thing to be concerned.

Therefore, the distribution component of most marketing program focuses on issues like what types of institution – and how many of each- should be included at each level of the distribution, and how those distribution members can be coordinated and motivated to effectively service the producer's ultimate customers.

2.2.2.4 Promotion

Not just only of a firm's product or service, or the attractiveness of its price, the reach ability location, customers won't buy it unless they know it exists, the benefit it offers and where to find it. Thus, the final component of a marketing program consists of a variety of promotional tools aimed at informing target customers about the offering and persuading them to make a purchase. These tools include: Advertising, Personal selling, and Sales promotion

The challenge, of course, is determining what combination of communication tools will be most effective in reaching potential customers, what message and appeals they should deliver and how extensive the communication must be for the firm to achieve its marketing objectives. The ultimate goal is to design and deliver an integrated marketing communications program in which all of the firm's promotional tools work together to deliver a consistent and compelling message to target customers. Once again, a solid understanding of the target segment's needs, choice criteria, and media viewing and reading habits is essential for making such decisions.

There is a difference between marketing to a business and marketing to a consumer.. Although selling a product to a person experience shows that the difference between these two types of markets runs deep. When promote to a B2B

you will realize these businesses work hard to streamline the buying process in order to save time and money. This often explains why a B2B purchase is based more on logic and why a consumer's purchase is based more on emotion.

It is true that the cost of a sale for the business-to-business market is more expensive and typically higher than the business to consumer market. The easiest way to explain this is that a business-to-business transaction often takes more consideration.

- **Marketing to B2B (Business to Business)**

  When promoting a product to a B2B had to be focus on the logic of the product by focusing on the product features. There is little to no personal emotion involved in the purchasing decision. The B2B market has a thirst for knowledge and they are information seekers. Be more in-depth with the marketing materials. The most effective marketing message will focus on how the product or service saves the time, money and resources.The business-to-business market is more interested in the logic behind the product. The customer will want to hear more about the features and how it will help them in saving time, money or resources.

- **Marketing to B2C**

  When promoting to a consumer you want to focus on the benefits of the product. Their decision is more emotional. Consumers are different in that they demand a variety of distribution channels for convenience, not so with the B2B market. Consumers are less likely to be interested in a lengthy marketing message. They will want to get right to the point. Consumers don't want to work to understand seller's benefits; instead they will want to clearly point out the benefits to them. The most effective marketing strategies will focus on the results and the benefits that the product or service will bring to them.

Business-to-consumer market purchases more on emotion. They are more interested in the benefit of the product. They will want to hear more about how their product or service helps them and what benefits it brings to them personally.

2.3 Financial Strategy Analysis

A feasibilities study as mentioned before, is a tool for providing potential investors, promoters and financiers with the information required to decide whether to undertake an investment, and whether and how to finance such a project. The scope and objectives of financial analysis are determined to a great extent by the definition of what investment is.

Quoting From the book *Manual for the Preparation of Industrial Feasibility Studies* by Behrens & Hawranek (1991. p.251)

> "With the characterization in mind, it becomes evident that financial analysis and final project appraisal involves the assessment, analysis and evaluation of the required project inputs, the outputs to be produced and the future net benefits, expressed in financial terms".

The methods applied for financial strategy and purpose are as follows: Analysis of the reliability of project data, analysis of the structure and significance of costs and income projections in order to identify the critical variables that could have a significant impact on the feasibility of an investment, determination and evaluation of the annual and accumulated financial net benefits, expressed as profitability, efficiency or yield of the investment, consideration of the time factor with regard to prices, cost of capital, and decisions taken in conditions of uncertainty.

As far as the investor is concerned, the investment criterion overruling all other project-related business objectives is the financial feasibility of an investment project. This means that the financial return on both the total capital invested and on the paid-in equality capital is sufficiency high. However, the interest of the parties involves a wider field of decision criteria than that represented by net returns on capital invested.

The feasibility study should therefore consider the various decision criteria. The financial evaluation should be carried out and presented in such a way that all parties concerned with the investment and financing decision obtain the information needed to ascertain their share of the projected return in relation to other parties as well as in relation to their inputs and the expected financial risks of the project.

When preparing a feasibility study, however, it is generally not known how the project will be finally financed. It is therefore necessary first to determine the financial feasibility of the investment project as a whole, and only then assess the individual feasibility for each participating source of finance (equity holders including joint venture partners, commercial banks and development finance institutions).

2.3.1 Criteria of Investment Assessment

In election of investment proposal, management needs accounting information as one of elementary important to take choice investment. Accounting information is packed into a decision model that has the shape of criterion of investment assessment to enable management selects best investment among available investment alternatives.

There are some methods to decide whether we need or not an investment or to select many investment alternatives. They are: Payback period, discounted payback period, Rate of Internal Rate of Return (IRR), and Net Present Value Method (NPV)

2.3.2 Payback period

The payback, also called pay-off period according to Peterson & Fabozzi (2002):"The payback period for a project is the length of time it takes to get your money back".

We assumed that the cash flows are received at the end of the year. So we always arrive at a payback period in terms of a whole numbers of years. If we assume that the cash flows are received, say, uniformly, such as monthly or weekly, throughout the year, we arrive at a payback period in terms of years and fractions of year, the formulation as seen in equation 2-1.

$$\text{Pay back period} = \frac{\text{Investment}}{\text{Cash enters clean}} \qquad (2\text{-}1)$$

2.3.3 Discounted Payback Period

Peterson & Fabozzi (2002, p.64):" stated that: "The discounted payback period is the time needed to pay back the original investment in terms of discounted future cash flows. Each".

So, from the quotation above, we assume that each cash flow is discounted back to the beginning of the investment at a rate that reflects both the time value of money and the uncertainty of the future cash flow.

There are two main discounting methods used in practice for the appraisal of investment projects, as far as the evaluation of financial feasibility is concerned: the net-present-value method (often referred to as NPV Method), and the internal-rate-of-return (IRR) method, sometimes also referred to as the discounted-cash-flow method. This method is also similar with analyzing payback period, about the measurement break-even an investment.

2.3.4 Net Present Value Method (NPV)

The net present value (NPV) of a project is defined as the value obtained by discounting, at a constant interest rate and separately for each year, the differences of all annual cash inflows and outflows accruing throughout the life of a project. The NPVs obtained for the years of the project life are added to obtain the project. An investment's net present value (NPV) is the sum of the present values of the cash inflows generated by the investment, minus the present values of all cash outlays.

NPV from a project of is being determined by is counting/calculating present value from cash flow that obtained from operation by using advantage level that desired and then lessen it with initial net cash expenditure.

NPV = present value from operation cash flow – initial net cash expenditure

$$NPV = -Io + \sum \frac{CFt}{(1+r)t}$$

Io = investment value/initial outlays
CFt = cash flow at the end of period t
r = discount rate
t = project age. (2-2)

A positive NPV means that the investment increases the value of the firm. A negative NPV on the other hand could decrease the value of firm. If its NPV value is zero its mean that the return just equals the return required by owners to compensate them for the degree of uncertainty of the investment's future cash flows and the time value of money. As describes in table 2.1

Table 2.1 Net Present Value Decision Rule

NPV Result	Means	Decision
NPV > 0	The investment is expected to ***increase*** the shareholder's wealth	Should Accept The Project
NPV < 0	The investment is expected to ***decrease*** the shareholder's wealth	Should Reject the project
NPV = 0	The investment is expected not to change shareholder's wealth	There are no differences between accepted or rejected the project

Source: Capital Budgeting, Peterson & Fabozzi (2002).

2.3.5 Rate of Internal Rate of Return (IRR)

The internal of Return is the rate of return earned on money committed to a capital investment and it is analogous to interest rates generally quoted in the financial marketplace. The effective annual interest rates that a bank promises on its savings accounts is the internal rate of return, and the annual percentage rate on loan (APR) is similar to the internal rate of return.

The internal rate of return is formally defined as the discount rate that results in a net present value of zero. A higher discount rate results in a smaller net present value for a conventional investment. This relationship is illustrated in figure 2.2 The internal rate of return is the discount rate at the point where the net present value profile line crosses the horizontal axis- the point at which the net present value is zero.

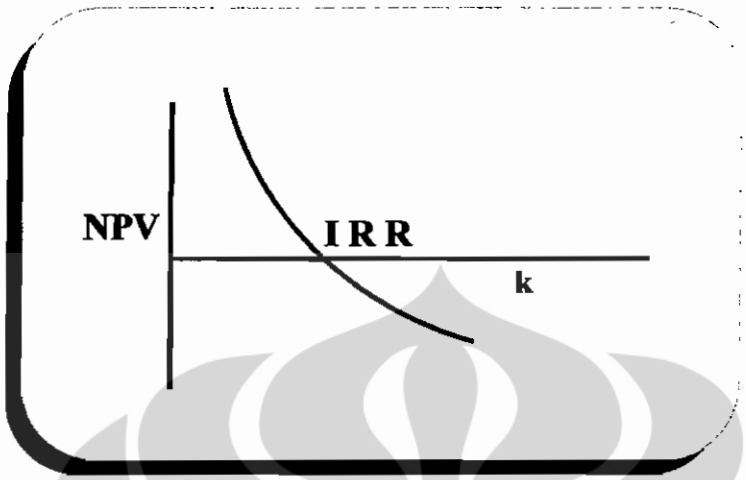


Figure 2.2 Net Present Value Profile

Source: Seitz & Neil

IRR can be formulated as:

$$NPV = \sum_{t=0}^{n} \frac{CFt}{(1+IRR)^t} - IO = 0 \qquad (2\text{-}3)$$

Where: CFt = Cash flow at the end of period t
IRR = Discount Rate
IO = Initial Outlay

After IRR had been analyzed then the decision making phase could seen in table 2.2 below.

Table 2.2 Internal Rate of Return Decision Rule

IRR Result	Means	Decision
IRR > Cost of Capital	The investment is expected to return more than required	Should Accept The Project
IRR > Cost of Capital	The investment is expected to return more than required	Should Accept The Project
IRR = Cost of Capital	The investment is expected not to change shareholder's wealth	There are no differences between accepted or rejected the project

Source: Capital Budgeting, Peterson & Fabozzi (2002).

2.3.6 Profitability Index

The profitability index is the ratio of the present value of change in operating cash inflows to the present value of investment cash outflows:

$$PI = \frac{\text{Present value of the change in operating cash inflows}}{\text{Present value of the investment cash outflows}} \quad (2\text{-}3)$$

The PI is often referred to as the benefit-cost ratio, since it is the ratio of the benefit from an investment (the present value of cash inflows) to its cost (the present value of cash outflows).

The profitability index tells us how much value we get for each rupiah /dollar invested. The decision rule is shown in table 2.3.

Table 2.3 Profitability Index Decision Rule

PI Result	Means	Decision
PI > 1	The investment returns more than $1 in present value for every $1 invested	Should Accept The Project
PI < 1	The investment returns less than $1 in present value for every $1 invested	Should Reject the project
PI = 1	The investment returns $1 in present value for every $1 invested	There are no differences between accepted or rejected the project

Source: Capital Budgeting, Peterson & Fabozzi (2002).

2.3.7 Real Options

A real option is the right, but not the obligation, to undertake some business decision, typically the option to make a capital investment. For example the opportunity to invest in the expansion of a factory is a real option. In contrast to financial options a real option is not tradable - e.g. the factory owner cannot sell the right to extend his factory to another party, only he has the decision to make. The terminology "real option" is relatively new, whereas business operators have been making capital investment decisions for centuries. However the description of such opportunities as real options has occurred at the same time as thinking about such decisions in new, more analytically-based, ways. As such the terminology "real option" is closely tied to these new methods.

Certain critical components of real options make them a powerful analytical tool. *First*, they recognize and value the flexibility that today's capital investments provide. *Second*, they recognize the staged nature of many investments and account explicitly for the reality that certain investments will never be made if -- based on additional information developed over time--they are deemed unattractive. In these instances, it makes sense simply to abandon them, rather than sink additional monies into a poor investment. By contrast, DCF (Discounted Cash Flow) evaluates a series of investments as if they will be made, regardless of whether they still make sense at a later date.

Additionally, with real option analysis, uncertainty inherent in investment projects is usually accounted for by risk-adjusting probabilities. Cash flows can then be discounted at the risk-free rate. With regular DCF analysis, on the other hand, this uncertainty is accounted for by adjusting the discount rate (using e.g. the cost of capital) or the cash flows (using certainty equivalents). These methods normally do not properly account for changes in risk over a project's lifecycle and fail to appropriately adapt the risk adjustment. More importantly, the real options approach forces decision makers to be more explicit about the assumptions underlying their projections. Another critical difference between DCF and real options is the effect of uncertainty (or risk) on value. Uncertainty is typically considered bad for the valuation of traditional cash flows. By contrast, uncertainty increases the value of real options.

Real options recognize that abandonment is a viable alternative that must be contemplated from the outset. Furthermore, dropping a project does not necessarily mean that the team in charge of the particular initiative has failed. Technology investments might often grant the possibility of pursuing an avenue in several months or a couple of years. But without the relatively small initial investment, an opportunity might be foreclosed forever. Although real options can be intuitively appealing, execution to arrive at a value is difficult. Determining the exact value of a real option is not necessarily critical. Instead, understanding the drivers of the valuation and the value relative to traditional methods is much more important. Major Types of Real Options

- Growth Option

  This option is to develop follow-on projects, expand markets, plant, operations and so on.
- Flexibility Option

  This option is to adopt a flexible approach in firm's operations, like production.
- Timing Option

  Companies with a positive NPV projects are not obligated to undertake them right away. If the outlook is uncertain, the company may be able to avoid costly mistake by waiting a bit.

- Abandonment Option

  This option is to abandon or terminate prior to end of planned life.

The biggest benefit of considering real options in the capital budgeting process is that they help decision makers reach optimal investment decisions. In this regard, real options complement or extend, not replace traditional DCF decision models. Some embedded real options may lead to completely different investment decisions compared to those based solely on a traditional DCF analysis.

In principle, because they can help optimize the capital budgeting process, real options should always be considered when making long-term investment decisions. Once managers grasp the concepts and are familiar with the basic framework for valuing projects embedded with real options, we would expect practice to change to the point where such options are routinely considered in the analysis of capital budgeting projects.

Real options have a flipside, too. *The major* cost of incorporating real options is that the decision process can quickly become quite complex. We assumed that the only factor that affected the choice of vehicles was the passage of a new energy bill within one year. Other sources of risk can be associated with this investment decision. For instance, we might consider possible fluctuations in the price of gas or innovations in the automobile industry. The more factors we consider, the more complex the analysis becomes. When we attempt to incorporate more factors into the capital budgeting valuation framework, the more "noise" we introduce, making the results of our analysis potentially less accurate. *Second,* incorporating real options into the analysis typically requires an array of probability estimates, one for each possible event, outcome, or scenario. For example, we assumed a 40% probability that the proposed energy bill would pass. In practical terms, this assessment may turn out to be the largest source of uncertainty. And the *last*, a typical capital investment project may have many embedded real options simultaneously, and it may be impractical to consider all of them.

Now that we have presented an analysis of costs and benefits, we predict that real options analysis will become one of the common tools managers and

accounting professionals use to evaluate long-term investment projects. Thus, management accountants need to learn as much as they can about real options so they can use them in their decision making.

2.4 Sensitivity Analysis

Risk is deviation between return expected and return happened. The first questions that arise in discussing the riskiness of an investment are often "What can go wrong?" and "What are the critical variables? Both of these questions can be answered through sensitivity analysis. Sensitivity analysis is the computation of present value or other profitability measures for multiple values of at least one variable that will affect the investment. Capital investment is affected by sales volume and salvage value. Net present value would be computed for numerous combinations of sales volume and salvage value.

Risk Analysis consists of 3 types that are:

a. Risk in company

   This Risk in company is total risk from portfolio of a company for plant asset entire. The interested parties to risk this are the manager, tax creditor and banking.

b. Market Risk

   Market Risk depicts company risk in capital market scope. And the party that very has interest to risk this is the stockholder.

c. Project Risk

   Project Risk is total risk from project if project are operated. This Risk gives uncertainty picture were that evaluation and to analyze influence from each variable when other variable fixed.

Some people believe that analysis of NPV is technique capital budget that excitement. At its fact, because approach NPV uses cash flow before profit, use all cash flow, and discounted cash flow properly and quickly, then very difficult to find theoretical mistake at technique referred. Nevertheless cash flow that projected at proposal capital budgeting is always seen draw, so decision to run project are referred will be quick taken. Nevertheless, cash flow that has been projected often not walks at its practices, and company ends at bankruptcy.

In order to company gets technique NPV that have the potency then needed approach of sensitivity analysis. Where this approach of sensitivity analysis explains how sensitive calculation change Net Present Value that constituted by assumptions.

2.5 SWOT Analysis

SWOT Analysis is a strategic planning tool to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or in a business venture or in any other situation of an organization or individual requiring a decision in pursuit of an objective. It involves monitoring the marketing environment internal and external to the organization or individual.

The SWOT Analysis was developed at Stanford Research Institute in the period 1960-1970. Researchers noticed that the corporate planning of big organizations often failed and they wanted to give those organizations a technique to better manage change. The SWOT analysis can be used for many purposes, having in common that it all involves decision making. Purposes that can think of are (amongst others): Strategic planning (for businesses as well as private persons); Evaluating processes; Marketing decisions; Evaluating investment opportunities; Evaluating potential partnerships.

Within the SWOT Analysis we can distinguish between an internal and an external analysis. The internal analysis focuses on the *internal situation* at hand (the organization scanned, or the process scanned or the business opportunity evaluated). It looks at the strengths and weaknesses of the object evaluated. The external analysis looks at the opportunities and threats in the *environment*.

- *Strengths* are: Resources and capabilities that can be used an a basis for competitive advantage.
- *Weaknesses* are: Points which diminish your competitive advantage.
- *Opportunities* are: Possibilities in the external environment for growth and profit. Try to use these to enhance or maintain your strengths and eliminate your weaknesses.
- *Threads* are: Changes in external environment which pose a threat for functioning. Threats diminish strengths and create weakness.

CHAPTER 3
ORGANIZATION OVERVIEW

3.1 Company Background

PT. Kansai Paint Indonesia is a subsidiary of Kansai Paint Japan co. ltd which has its base in Japan. As a multi National Company Kansai Paint Indonesia is has its own background history that came from Japan. In this chapter would give the organization overview of PT. Kansai Paint Indonesia.

3.1.1 Kansai Paint Co.,Ltd.

Kansai Paint Japan was founded by Katsujiro Iwai in 1918. Katsujiro Iwai was born in Kameoka, in the outskirts of Kyoto, in April 1863. During his childhood, the modernization of Japan finally got underway through the Meiji Restoration of 1868. Before that, Japan had passed through a long period of feudalism Early in his life he left his hometown to live in Osaka, where he began his career as a merchant. He was mostly self-educated, acquiring business skills and foreign languages all by himself. However, his parents gave him words to live by. His father taught him: "Become a human being who benefits the nation." His mother taught him: "You must bear all difficulties, no matter what."

Figure 3.1 Katsujiro Iwai, Founder Kansai Paint Co,.Ltd.

Source: www.kansaipaint.co.jp

During his youth, Japan was an extremely poor country in comparison to developed countries in Europe and the United States. Japan based its industrial policy on importing products and raw materials from foreign countries, processing them, and exporting the finished products. Katsujiro Iwai was originally a trader. However, he understood that only importing foreign products would not be of much benefit to Japan's development. He wanted to create Japanese-made products that were as good as foreign ones. To achieve this ambition, he invested the profits he earned through trade into founding six manufacturing companies, including Kansai Paint.

The foundations of his business emphasized both morality and public-spiritedness, based on his belief in the necessity of pursuing both profit and the economic development of society at the same time. To carry out this business philosophy, he had to undergo many bitter ordeals. During the turbulent decades of the 1920s and 1930s, many of his businesses were on the brink of being swept up in nationwide panics, and Kansai Paint was no exception. Many companies were closed down and withdrew from business. Katsujiro Iwai maintained an unwavering belief that businesses should never swerve from their course in pursuit of temporary gains or because of temporary problems. The logo of alesco also had the meaning.

Figure 3.2 Alesco logo

ALESCO, means "to grow" in ancient Latin. It reflects Kansai Paint's commitment to growth towards the future. The ALESCO logo symbolizes the three basic key words that Express Kansai Paint's image: **science, growth and reliability.** The square blue field embodies the rationality and certainty of scientific advancement, while the A's without the crossbar Represent growth in the sense of spread wings soaring into the sky and reliability portrayed through the overall balance.

Today, Kansai Paint has about 2,500 employees, commands unmatched engineering and development capabilities, and supplies customer-attracting products to world markets. However, the real defining trait of Kansai Paint is more than products and technology. Instead, it is something invisible to the eye, something that creates its employees, products, and skills. What is that? It is a business philosophy rooted in the morality on which Kansai Paint's founder based his life. As such, it is a legacy that lives and is practiced even today. He always said, "If your opinion will benefit the Company, then state it frankly, regardless of your position within the Company." He thought that a company was truly democratized when each and every employee who constitutes the Company could state his views, bringing in a breath of fresh air. The more open a company is in this way, the more vitality its employees have. That was Katsujiro Iwai's thinking. This approach is now deeply rooted in Kansai Paint. In fact, it is a fountainhead of the Company's corporate culture. To this day, Kansai Paint's 2,500 employees continue to express themselves - a tribute to the inspired thinking of the Company's founder. Now This business has been spread all over the world, globally expanded in America, Europe, Asia, Africa and others as shown in figure bellow for global network of Kansai Paint.

Figure 3.3 Kansai Paint Global Network

Source: www.kansaipaint.co.jp

3.1.2 PT. Kansai Paint Indonesia

Established on November 4th, 1999 at the beginning, PT Kansai Paint Indonesia was rented a simple warehouse in Jababeka, Cikarang. With the capital investment came from Japan as the principal of the industry and a local company, these share divided as Kansai Paint CO,LTD. (51,00%), Eguchi Iwao CO.,LTD. (20,15%), Mitsubushi Corporation (20,15%), PT Gajah Tunggal Prakarsa (8,70%). This factory had been growing fast on May 11, 2006 the company doing expansion to produce CED, a water based system by electric coating anti rust for automotives industry.

Main core business of PT. Kansai Paint Indonesia as a design and manufacturing coatings product for automotives industry either is car and motorcycle. With the latest technology implied from Japan PT. Kansai Paint Indonesia has its competitive advantages from other competitor. About 70% the raw materials for production needed are still imported from others country such as Japan, Malaysia and Thailand. As the design formula mainly came from the principal in Japan, the requirements from customer are able to fill by Kansai Paint Indonesia, for an example because quality is a main requirement, the system also a concern to company. And in July 2006 PT. Kansai Paint Indonesia was awarded ISO/TS 16949: 2002 Quality Management System Certification.

Figure 3.4.International certificated.

Source: Technical & QA Dept. PT. Kansai Paint Indonesia

PT. Kansai Paint Indonesia main customers are automotive car industry from Japan car maker spread all over Jakarta area, as seen on figure bellow. Japanese car maker basically only use same supplier from only their country. This makes competitive advantages for PT. Kansai Paint Indonesia as a Japanese company.

Table 3.1. Kansai Paint Indonesia Main customer

No	Customer		
1	PT Toyota Motor Manufacturing Indonesia	CED, Top Coat	TOYOTA
2	PT Astra Daihatsu Motor	CED, Top Coat	DAIHATSU
3	PT Suzuki Indomobil Motor R4	Top Coat	SUZUKI
4	PT Honda Prospect Motor	Top Coat	HONDA
5	PT Kramayudha Tiga Berlian	CED, Top Coat	MITSUBISHI MOTORS
6	PT Nissan Motor Indonesia	CED, Top Coat	NISSAN
7	PT Hino Motor Indonesia	CED, Top Coat	HINO
8	PT Pantja Motor	CED, Top Coat	ISUZU

Source: Sales & Marketing Departement

And for the new product that would be produce in the future, PT. Kansai Paint Indonesia could used about 50% the product as raw material for the other finish good product, And the other 50 % would be sold for other coating industry in local area and global area. For example it could be sold to PT. Gajah Tunggal Prakarsa or other coating industry company.

3.1.3 Philosophy, Mission and Vision

To realize new innovations in coating materials, PT. Kansai Paint Indonesia have defined their philosophy so that the employees are eager to undertake new challenge, and so that they can combine their wisdom and knowledge to create future products. PT. Kansai Paint Indonesia aim to use their products and services to make continuous contributions to society.

The corporate mission is to contribute to society by providing eco-friendly and value added coating materials and services that satisfy customers. By viewing company vision as synchronizing business and environmental conservation, PT. Kansai Paint Indonesia promotes its activities by developing high quality, high performance, and low cost coating product with new functionality, and aims to be the leading, most trusty company. PT. Kansai Paint Indonesia has defined basic activities guidelines based on corporate mission so long with the principal in Japan and other group companies.

- **Basic company activities Guidelines**
  a. Conduct all phases to company's business operations while adhering to high ethical standards, will comply with laws and social norms, and will engage in fair and transparent business activities to win trust of societies throughout the world
  b. Respect the cultures of each country and region, observe local customs for better coexistence with such societies, and will use business operations to contribute to he development of these society.
  c. Actively and voluntarily get involved in environmental conservation while manufacture and provide eco-friendly products.
  d. Develop and provide products and services based on the principle of "customer first", with the goal of satisfying their customers.
  e. Respect each employee's individually and create workplace environments that nurture the spirits of challenge of teamwork.
  f. Respond to the expectations of their customers, employees, and shareholders by sustaining the continuous growth of their global business operations.

3.2 Organization Structure

PT. Kansai Paint Indonesia is a Multi National Company with principal company from Japan. There are several expatriate in Board of Director, it's also consists some local person. The structure could be seen as below.

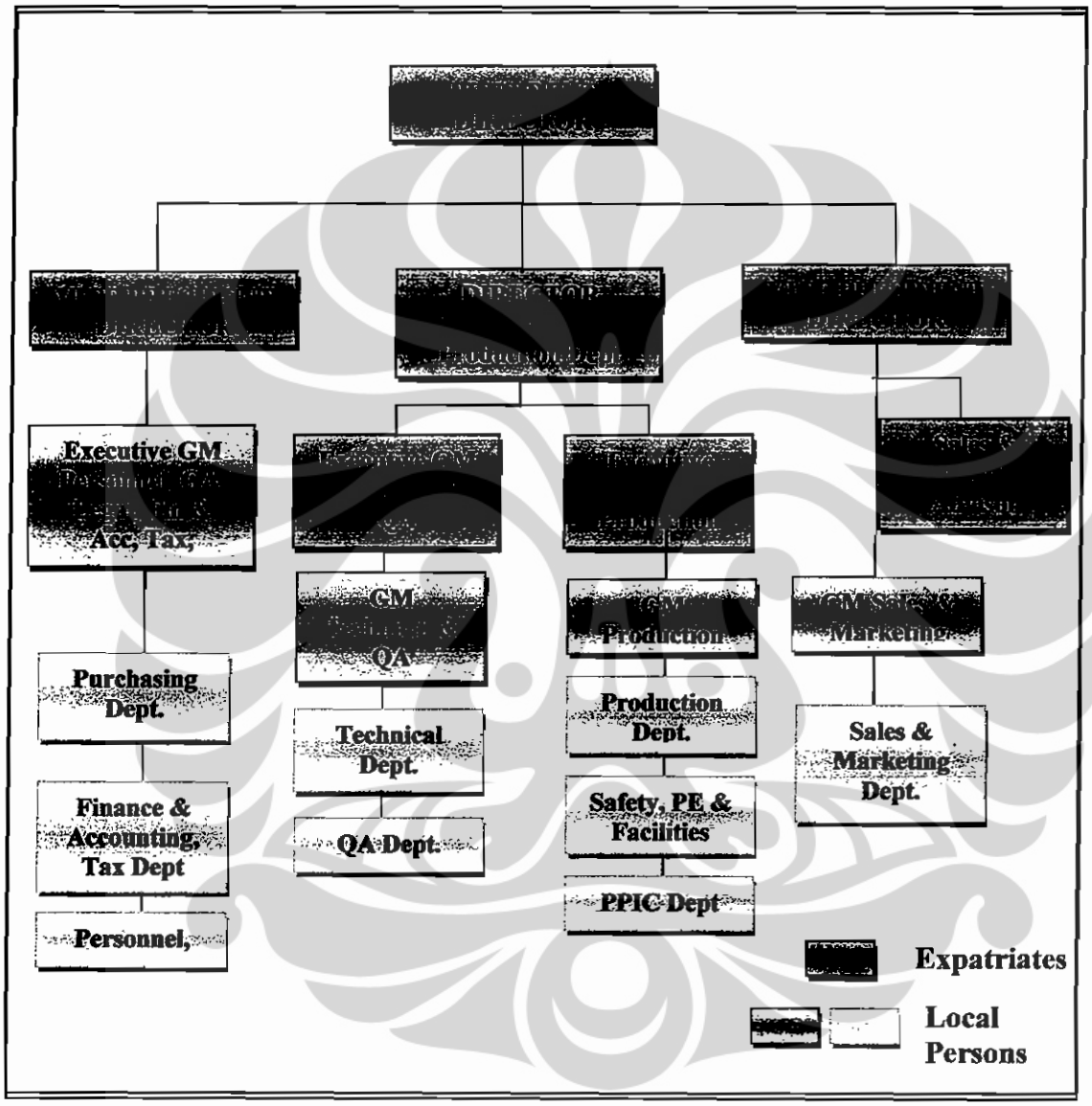


Figure 3.5 PT. Kansai Paint Indonesia Organization Structure

Source: HR Department PT. Kansai Paint Indonesia

3.3. Product

As a main market share in Design and manufacturing coating product for Japanese automotive, PT. Kansai Paint mission is to fulfill customer needs especially in automotive industry. PT. Kansai Paint has range of specialty of products and price based on customer needed. The new product resin synthetic would be used as internal raw material and to be sold to customer based on their needed.

Table 3.2 Products

No	Categories	Product type
1	CED Paint	Acrylic & Regular Type
2	Primer Coat	For Plastic & Metal
3	Base Coat	For Plastic & Metal
4	Clear Coat	For Plastic & Metal
5	Thinner	Fast, Medium, slow evaporate
6	Hardener	Plastic & Metal

Source: Production Department PT. Kansai Paint Indonesia

3.3.1 CED Paint

CED (Cathode Electro Deposit) paint is a type of paint which used as an anti rust paint for steel materials on car body system. It's made from a several materials such as resin pigment additive and Di water. Its application is from an electric system of coating. It's a water base system, and its environment friendly. PT. Kansai Paint had already sold the product in domestic and also in global area such as Vietnam and Malaysia.

3.3.2 Primer Coat

This type of paint is a surface paint which used after CED paint and before base coat (metallic color) paint. There are several color could applied for this type of paint usually its color are grey and black. As a surface for top coat application this paint is used as a bounding between top coat and steel CED plate.

3.3.3 Base coat

Base coat is a coating that made color for paint application in car. It's used basically for the decoration colored purposed beside for the other functional reason. Main raw materials for this paint are resin, pigment, solvent and additives, which are had its own function and characteristics.

3.3.4 Clear Coat

This type of material had main function for glossiness of automotive unit. Beside that it's giving protection for anti scratch. Usually its had clear visual not in color.

3.3.5 Resin Synthetic

This type of product is used as a raw material to produce coating product for automotives industry. The product consists of almost 70% of synthetic material which result as a reaction to heating process and viscosity difference at the Reactor. It's has function as the polymerization bond when paint product had been used on automotive part and bake in heated oven.

Beside those products PT. Kansai Paint also made a dilution and hardener for its coatings process in customer. In this study would analyze about the feasibility for resin raw material if it is produced by PT. Kansai Paint. Product image before applied and after applied as shown in figure 3.6.

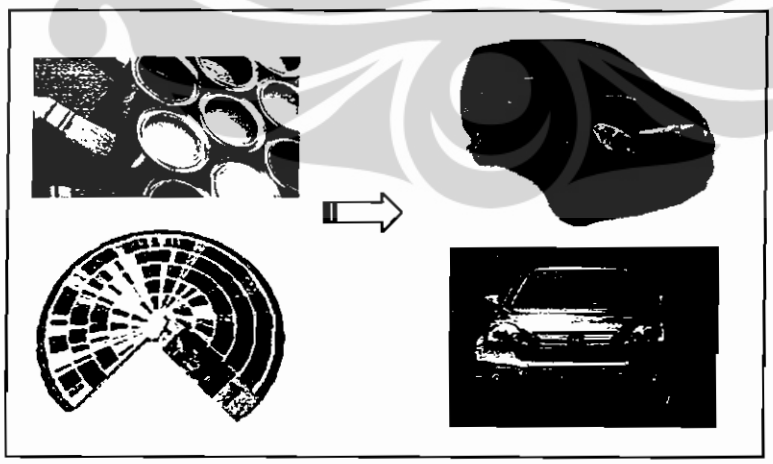


Figure 3.6 Product Image & Applied.

Source: Sales & Marketing Department PT. Kansai Paint Indonesia

3.4. Manufacturing Process

PT. Kansai Paint Indonesia as a subsidiary of Kansai Paint Japan Co.,ltd always keep best quality of its product in order to make customers satisfied. The quality of the product depends on how product being produce. Meanwhile in production system uses mass production in different variety quantity of product. Quality control is conducting starting from receiving raw material, production process until delivery finished goods. Machines mostly are imported from Japan and several are from local area. General steps in production process are: Semi Finish Good, Loading and Mixing, Filling and Packing. Mean while the synthetic resin materials would be produce in new factory at the back area of PT. Kansai Paint Indonesia and to be delivered to the next paint manufacture process as shown in Figure 3.7.

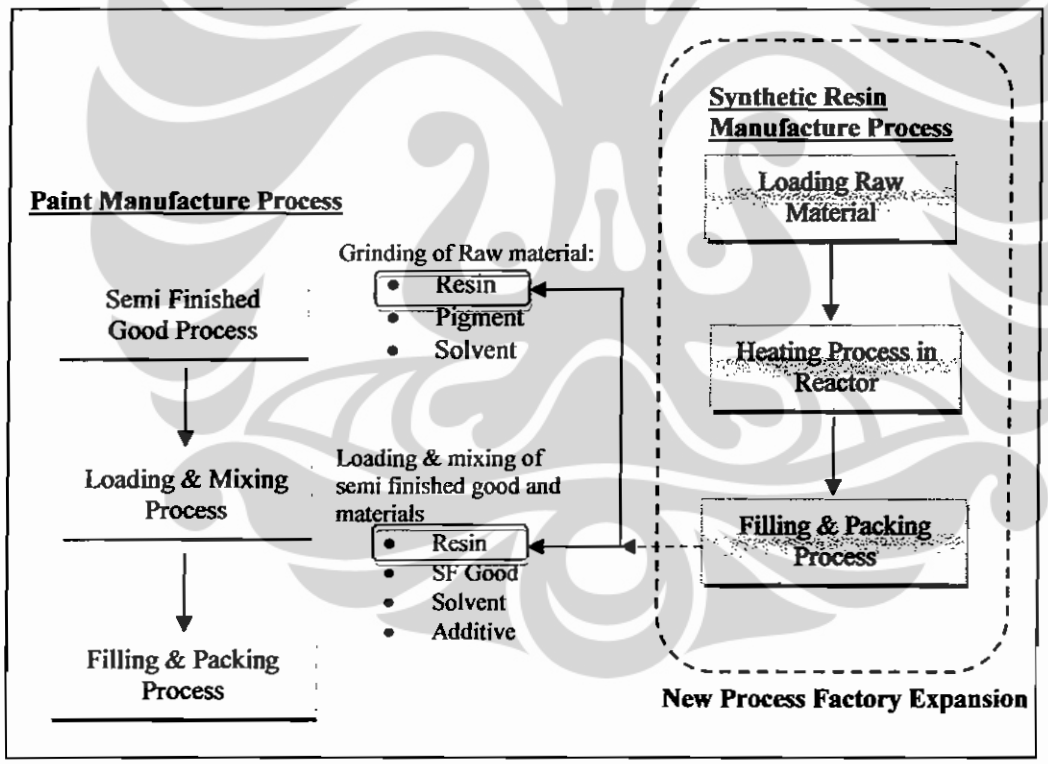


Figure 3.7 Manufacturing Process

Source: Production Department PT. Kansai Paint Indonesia

CHAPTER 4
ANALYZING

PT. Kansai Paint Indonesia as a Multi National Company from Japan would get its investment from Kansai Paint co, .ltd as a principle at Japan in order to fill the demands for automotive paint industry challenges. Investment would be taken by expanding new factory to produce resin raw material that would be used as an internal usage and to be sold for domestic and international market.

Analysis would be assist in two parts shown in figure 4.1 below, marketing analysis would be used to get the new market and also maintain the existing customer to be more aware to PT. Kansai Paint Indonesia brands. The term 4Cs and 4Cs is used as a guideline. And for the financial analyses some financial tools used such as Payback Period, Discounted Payback Period, Net Present Value, and also Internal Rate of Return, Its all would be end up into a decision making phase to accept or cancelled the project.

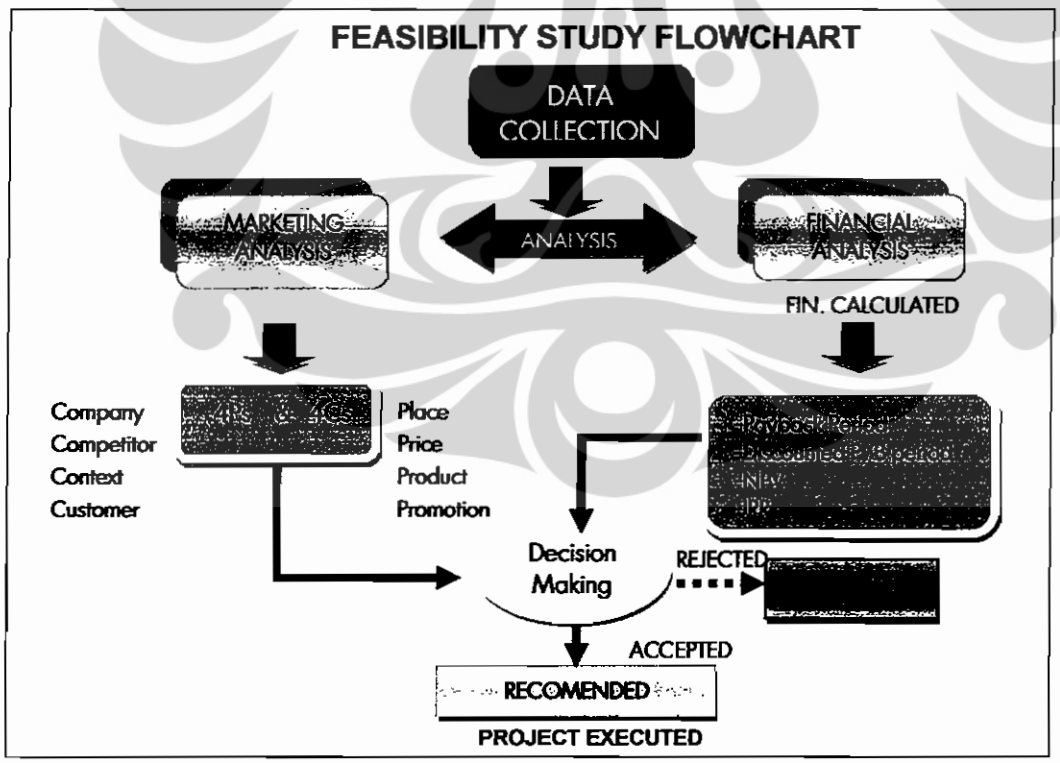


Figure 4.1 Feasibility study flow chart

Source: Kasmir & Jakfar (2003), Business Feasibility Study, Prenada Media, Jakarta

4.1 Marketing Analysis

The new product that would be produce is a used as a raw material by PT. Kansai Paint Indonesia itself and could be selling as finish good to other company, it is really necessary to make a marketing strategies to deliver it to customer. Although is new customer or an existing customer. The field of marketing strategy encompasses the strategy involved in the management of a given product.

4.1.1 4Cs Analyzing

Marketing as one of a strategy for company to make a profit is needed to be analyzed. The 4 Cs analyzing that stands for context, customer, company and competitor should be applied when assess a marketing phase and handle for knowing the background market situation.

4.1.1.1 Context

As Indonesia's economy continues to grow so was the demand for paint and coatings products in the region. With this growth the nation has seen an improvement in local transport and energy networks - which require paints and coatings. Even though Indonesia's largest market sector for painting industry is decorative coatings, in automotive sector the original equipment manufacturing (OEM) and refinish coatings also predicted to move faster in the coming years after the automotive industry recovers from the economic slump. Context to produce local raw material that usually imported from other country, would give a competitive advantages for PT. Kansai Paint Indonesia. Cut cost that could be excess from this localization would make higher profit for PT. Kansai Paint Indonesia. The Synthetic Resin raw material used for the formula is one of the high percentages to make coating product for automotive industry. Beside for internal consumption this material could sell in local market and also international market.

The global trend Indonesia has seen tighter environmental controls in recent years that have influenced the market in a positive way. It is more focus on the production process and waste management. Coating industry player compete

each other to be a market leader. Marketing activities and other social reasons can influence people's decision. Part of the marketing person job function are to find good reason for convincing customer to buy and satisfy one or more of their needs that could be brought better than the other product alternatives.

4.1.1.2 Company

- **Philosophy, Mission and Vision**

  To realize new innovations in coating materials, PT. Kansai Paint Indonesia have defined their philosophy so that the employees are eager to undertake new challenge, and so that they can combine their wisdom and knowledge to create future products. PT. Kansai Paint Indonesia aim to use their products and services to make continuous contributions to society.

  The corporate mission is to contribute to society by providing eco-friendly and value added coating materials and services that satisfy customers. By viewing company vision as synchronizing business and environmental conservation, PT. Kansai Paint Indonesia promotes its activities by developing high quality, high performance, and low cost coating product with new functionality, and aims to be the leading, most trusty company. PT. Kansai Paint Indonesia has defined basic activities guidelines based on corporate mission so long with the principal in Japan and other group companies.

- **Basic company activities Guidelines**

  a. Conduct all phases to company's business operations while adhering to high ethical standards, will comply with laws and social norms, and will engage in fair and transparent business activities to win trust of societies throughout the world

  b. Respect the cultures of each country and region, observe local customs for better coexistence with such societies, and will use business operations to contribute to he development of these society.

  c. Actively and voluntarily get involved in environmental conservation while manufacture and provide eco-friendly products.

d. Develop and provide products and services based on the principle of "customer first", with the goal of satisfying their customers.
e. Respect each employee's individually and create workplace environments that nurture the spirits of challenge of teamwork.
f. Respond to the expectations of their customers, employees, and shareholders by sustaining the continuous growth of their global business operations.

- **SWOT Analysis**

SWOT analyses of PT. Kansai Paint are based on the analyses between an internal and an external analysis. The internal analysis focuses on the *internal situation* at hand (the organization scanned, or the process scanned or the business opportunity evaluated). It looks at the strengths and weaknesses of the object evaluated. The external analysis looks at the opportunities and threats in the *environment*.

a. Strengths

PT. Kansai Paint Indonesia strength is the quality of the product that delivered to the customer, which the company already had experience and a long term business relationship with the car industry maker in Japan. PT. Kansai Paint is one of the most established and good quality known, and has a very loyal set of enthusiastic partners that advocate the brand. Such a powerful loyalty means that Kansai Paint Indonesia not only recruits new customers, it retains them i.e. they come back for more products and services from Kansai Paint Indonesia..

b. Weakness

As its decision based on principle from Japan and all the things that related to the production basic formula are also from Japan. PT. Kansai Paint Indonesia could not get such as cost reduction from production efficiency by its own decision. For example to make a cost reduction for raw material that fully imported from other country PT. Kansai Paint Indonesia should gave best feasibility study of its activity to cost reduction, in order to get capital investment for such a project.

c. Opportunities

Kansai Paint Indonesia has the opportunity to develop its new product for the customer based on fully requirement they have been ask. The environment friendly types of paint lead the company to become the eco friendly company. And there are opportunities to supply the product to other foreign and local company. With the increasing of automotive industry in Indonesia, PT. Kansai Paint production result also will be increasing, meaning that the needed of resin as raw material would be also increased. And the market for this product also still could be more huge, in order to fill the coatings purpose for automotives industry. With this kind of situation PT. Kansai Paint Indonesia expansion for new product planning would be a good investment for capital flow for the company.

d. Threats

The biggest threat to coating industry and resin synthetic companies such as Kansai Paint Indonesia is the high level of competition in the markets. Being successful in the best in quality and technology delivered to the customer could attracts competition, by valued best technical advisory about the product sold to customer. The company works very hard on research and development and marketing in order to retain its competitive position. As a chemical company the environment issued nowadays could give a better valued to the company. To achieve the good corporate responsibility, environment clean process must had been applied by the company through latest technology used.

4.1.1.3 Customer

- **Segmenting ,Targeting and Positioning**

This business expansion will develop marketing strategy and try to segmented customer by divide market into several different customers that could need different product and quality, based on their decision. Market segmentation is needed because there are a lot of customer with different needed and style that could be a potential buyer to our product. Strategy implemented across all market to aim at middle to low market by giving

divers services. This segmentation is very sensitive to price, that's why the products should focus on price, without eliminate the value of itself. Customers not only buy product based on price only, some customer also buy product based on its quality as long as the price is affordable. PT. Kansai Paint Indonesia which had common customer would face new opportunity of potential new customer to supply the resin product. Segmentation is needed by the product to be accepted by the customer based on their needed and buying power.

The targeting has already identified as a primary and secondary priority segment. As a primary priority PT. Kansai Paint Indonesia needed for synthetic resin material itself for this product. For the efficiency production the other company that used resin materials could be set as secondary customer, such as other paint manufacturer and other industry that need resin material in local either in global market. Of course, the first marketing step is to manage new customer in order to become an existing customer, by giving best value and good quality of our product. Second is trying to influence or acquisition a middle customers be more recognizes by giving more promotion. Through innovation and improvements in all aspects, PT. Kansai Paint Indonesia will offer a good value to customers even though the purchasing power is going down because of Indonesia economic conditions. The position of PT. Kansai Paint Indonesia right now already closely with its target market which is customer that required affordable price with good quality of products

4.1.1. 4. Competitor

Competitors for synthetic resin product for automotive paint industry in Indonesia are come from different company in Indonesia. Some came from other country such as Japan and Thailand, and the other come from local company. This situation could make different decision making of buying product for customer based on the specific strength and weakness of each competitor. As seen on table 4.1 the main competitor for synthetic resin industry

Table 4.1 the Competitor for Synthetic Resin Manufacturer

No	Company Name	Location	Type of Product
1	PT. Pardic Jaya Chemical	Tanggerang	Synthetics Resin
2	PT. Diachems Resin Indonesia	Tanah Abang	Synthetics Resin
3	PT. Justus Kimia Raya	Cilincing	Synthetic Resin
4	PT. Kencana Inti Dasar	Jakarta	Synthetic Resin
5	PT. Dow Chemical	Jakarta	Synthetics Resin
6	Kansai Resin Thailand	Thailand	Synthetics Resin

Source: Sales & Marketing Dept. PT. Kansai Paint Indonesia

4.1.2. 4Ps Analyzing

4.1.2.1. Product

Product consist of existing finish good product and raw material product planned to be produce in local area

Table 4.2.Product type (Existing)

No	Categories	Product type	Qty (tons/year)
1	CED Paint	Acrylic & Regular Type	6,321.31
2	Primer Coat	For Plastic & Metal	4,995.75
3	Base Coat	For Plastic & Metal	3,442.64
4	Clear Coat	For Plastic & Metal	1,360.01
5	Thinner	Fast, Medium, slow evaporate	2,478,00
6	Hardener	Plastic & Metal	1,085.00
Total			**19,682.70**

Source: Sales & Marketing Dept. PT. Kansai Paint Indonesia

It is possible to produce outside of the existing product mentioned above. A synthetic resin product as example of new product would give competitive advantages and good profit for PT. Kansai Paint Indonesia. A synthetic resin product as example of new product categories of resin raw material would give competitive advantages and good profit for PT. Kansai Paint Indonesia. With the production planning of 6000 tons / year, about 3000 tons used as internal raw material needed and the exceeding product could be sold. Beside for internal needed for raw material used, it can be sold for other paint manufacture.

4.1.2.2. Price

The production cost of new product is calculated from the price consist of production cost, material cost also direct labor cost and Factory over Head. Combined with production quantity we could get total price. With the price set at RP. 16.500,00./ kg we could get the margin 5% from the production cost. And this price is very competitive from the other competitor exist in market. Which is their price is above Rp. 19.000,00./ kg

The sales price of this new product is had its better position than the other price of competitor, which below the market price. With this situation the new product price would give competitive advantages for the company to enter the market for new product.

4.1.2.3 Place

Right now KPIN has more order from customer both domestic market and international market. Now the capacity of production for finish goods has been already 1000 tons per year especially for automotives industry. In order to fulfil the needed of raw material for its own production and other potential market for this raw material in Indonesia and in global market, KPIN has to expand new factory to produce synthetic resin. This new factory is planning to build in back of PT. Kansai Paint Indonesia area at MM 2100 Industrial Town Cibitung Bekasi.

4.1.2.4 Promotion.

Customer awareness and perception of KPIN product are goals from promotion that should be conduct to customer. Through regular promotion media such as television, newspaper or magazine this product could not get in to the customers targeted, because it's a B2B market oriented. Through good promotion by giving presentation of our product knowledge and value our strength principal from Japan, we could excess good quality product that environment friendly that would be a competitive advantages for our product through our customer. Locate in MM 2100 Industrial Town Cibitung Cikarang. PT. KPIN could access to the customer from automotives industry that spread all over DKI Jakarta. This new expansion factory for produce resin would take place the existing area of KPIN.

4.1.3. Relation between 4Cs and 4Ps.

The 4Cs model is based on the 4Ps. The 4Cs is a customer-centric approach while the 4P is a product-centric approach. The 4Cs makes more sense since marketing focuses on satisfying customer satisfaction. In a customer-oriented marketing mix, product becomes commodity - the product for the consumers or citizens; price becomes cost to the customer and includes time and energy cost; place for the customer is channel and promotion becomes communication. Some might argue that this is a mere play on words, but it does portray a massive shift in marketing management thinking, philosophy and strategy. The issue is not what words are used but how to offer value to the user. Interestingly, the customer charters that are now proliferating are also examples of a paradigm shift toward customer satisfaction as a priority. Their basic philosophy is Pro-marketing - to promote the marketing activities, moving forward. However for the low growth economic, it is replaced by Com-marketing - to communicate and cooperate with the consumers, sometimes stopping or even moving backward to listen to their voices. In simple words all the four Ps which Dr. Kotler gave should be focused on the **consumer satisfaction** of consumer needs that automatically meant that organizations now needed to "know" the consumer better.

a. **Place** becomes **Company**
b. **Price** becomes **Competitor**
c. **Promotion** becomes **Context**
d. **Product** becomes **Customer needs and wants**

4.2. Investment Requirement Planning

Main factor to do an expansion project is how we could predict fund or any capital which need to be invested during the project start. The manufacturing plant that need for producing resin product at PT, Kansai Paint Indonesia would be in the same area with old factory that already exist, in Cibitung Bekasi. Only to build the manufacturing area it would need new space for the new building, and the place would take in back of the existing factory. Thus the expense for factory expansion is the as high as Rp 6,589.000, 000.00 as shown in table 4.3. Below:

Table 4.3 the expenses for factory expansion

Description	Investment	Age (year)	Depreciation (year)
Building	2,104.00	5	22.87
Machine	1,450.00	5	15.29
Factory equipment	860.00	5	11.18
Office supplies	110.00	4	2.52
License	400.00	5	0.83
Lay out plant, Office	350.00	5	9.17
Electricity Installation	1,300.00	5	12.67
Delivery of machine	15.00	5	0.17
TOTAL	**6,589.00**		**74.7**

Source: Production Dept. PT. Kansai Paint Indonesia

4.3. Revenue Projection

The revenue of PT. Kansai Paint Indonesia from new factory built are received from the new product sold based on Internal Transfer Price (ITP) which has been decided by Top Management Policy of PT. Kansai Paint Indonesia as follows:

Year 2011	ITP as 1.15%
Year 2012	ITP as 1.14%
Year 2013	ITP as 1.13%
Year 2014,	ITP as 1.12%
Year 2015,	ITP as 1.11%
Year 2016 up,	ITP as 1.10%

Internal Transfer Price (ITP) is the amount of product selling price from manufacturing until marketing side which based on percentage of production cost. Firstly we assume that the capacity of production is not full capacity based on production trial, it will be operate step by step according on capacity bellow:

January	2011	Production Capacity:	60%
February	2011	Production Capacity:	70%
March	2011	Production Capacity:	80%
April	2011	Production Capacity:	90%
May	2011	Production Capacity:	90%
June	2011	Production Capacity:	100%

And PT. Kansai Paint Indonesia will forecast that the capacity increase as 5 % every year.

4.4. Operational Cost

Operational cost is expense that released by company to the operational activities that have the character of variable cost and fixed cost. The elements of operational cost included are:

4.4.1. Manpower Requirement

We need manpower to do operational activities based on the skill of respective manpower. The detail of man power planning shown in table 4.4.

Table 4.4.Manpower Planning

DESCRIPTION	STAFF	OPERATOR			TOTAL
		N-shift	Shift I	Shift II	
Assiatant Manager		1			1
Supervisor			1	1	2
Administration		1			1
PPIC					
- Raw Material Planner			2	2	4
- Scheduling			1	1	2
- W/H Finish Good controller					
Cleaner In/out door		2			2
Total					**11**
Loading					
- Raw Material Collector			2	2	4
- Loading Raw material			4	4	8
Processing					
- Production Process (Reactor)	1		3	3	7
- Production Mixing			3	3	6
- Production Filling & Packing			2	2	4
Inspection					
- Quality Inspection	1		2	2	5
Technician					
- Utility	1		1	1	3
- Equipment	1		1	1	3
Total					**40**

Source: HR, Production Dept. PT. Kansai Paint Indonesia

4.4.2. Operating Expense

And entire operating expenses in table 4.5. As follows:

Table 4.5.Operating Expense

Manufacturing New Product		YEAR 2011 GENERAL AND ADMINISTRATION COST (in million Rupiah)			
No	DESCRIPTION	NOV	DEC	TOTAL	TOTAL
		Rp	Rp	Rp	%
1	Salary (Monthly)	20.00	20.00	40.00	21.25
2	Transportation Allowance	5.00	5.00	10.00	5.31
3	Meal Allowance	1.65	1.65	3.30	1.75
4	Hand phone Allowance	3.00	3.00	6.00	3.19
5	T H R			0.00	0.00
6	Office Supply	2.50	2.50	5.00	2.66
7	Telephone & fax	3.00	3.00	6.00	3.19
8	Administration Bank	4.00	4.00	8.00	4.25
9	Social Allowance	3.00	1.50	4.50	2.39
10	Car Rent	7.00	7.00	14.00	7.44
11	Fire Insurance	3.00	3.00	6.00	3.19
12	PPH 21	7.60	7.60	15.20	8.08
13	Sample Purchase	3.00	3.00	6.00	3.19
14	Recruitment, training	5.00	5.00	10.00	5.31
15	Healthy Insurance	6.00	6.00	12.00	6.38
16	Uniform Employee			0.00	0.00
17	Office supplies maintenance	3.00		3.00	1.59
18	Product development	3.00	3.00	6.00	3.19
19	Water	7.00	7.00	14.00	7.44
20	Logistic Rent	6.00	6.00	12.00	6.38
21	Security equipment			0.00	0.00
22	Depreciation	3.60	3.60	7.20	3.83
TOTAL		**96.35**	**91.85**	**188.20**	**100.00**

Source: KPIN Finance & Accounting Dept. PT. Kansai Pain Indonesia 2010

4.5. Capital Budgeting.

The resource of the capital for this factory expansion project comes totally from the KPIN itself (all equity finance) as Rp. 4,589,000,000.00

Formula: $\mathbf{Re = R_F + ß\ X\ (R_M - R_F)}$

Re = Cost of Equity

$\mathbf{R_F}$ = Risk – Free Rate

β = PT. Kansai Paint Indonesia beta

$\mathbf{R_M - R_F}$ = Market Risk Premium

Data from SBI (Interest Rate from Bank Indonesia), given R_F = 6.75 % (See Appendix 1). Based on data from Damodaran given the market risk premium for Indonesia = 12.88 % (See App.2). And to determine the value of β, Writer estimate the firm's beta by involving the whole industry and choose one of the beta of the chemical industry, as β = 0.95 (See App.3)

So: **Re** = 6.75 % + (12.88 % X 0.95)

= **18.99 %**

Finally, it is found that the cost of equity is 18.99 %, so that the discount rate for this project is 18.99 %.

4.6 Assumption

All calculation is done in Rupiah which following by some assumptions below:

a. Salary will increase as 6% per year
b. Costs will increase as 5% per year.
c. Output will increase 5% per year.
d. Interest Rate in domestic is 6.5%.

4.6.1 Depreciation

The calculation of depreciation is yearly, according to straight line method for 5 years.

Table 4.6 Manufacturing New Product Depreciation

Description	Investment	Age (year)	Depreciation (year)
Building	1,104.00	5	22.87
Machine	950.00	5	15.29
Factory equipment	860.00	5	11.18
Office supplies	110.00	4	2.52
License	400.00	5	0.83
Lay out plant, Office	350.00	5	9.17
Electricity Installation	800.00	5	12.67
Delivery of machine	15.00	5	0.17
TOTAL	4,589.00		74.7

Source: Production & Engineering Dept PT. Kansai Paint Indonesia

4.6.2 Project Period and Preparation

Preparation for this project was in 4 months since in the middle of the year 2011 and the project period assume as 10 years.

4.7 Profit (Loss) Projection

In profit/loss projection analysis we could see from appendix 8 that tell us in the first year of PT. Kansai Paint Indonesia new factory expansion is has already receive profit as Rp. 3,620,830,000.00.

4.8 Cash Flow Projection

PT. Kansai Paint Indonesia is invests only to increases of their ownership interest. Whether it's a right decision or no it could be seen by the cash flows in the next future from its investment decision. When a company invests in new assets, it's expects the future cash flows to be greater than the present cash flow

(Peterson & Fabozi, 2002). This cash flow projection could tell us the cash flow which will be invested with some assumptions so that PT. Kansai Paint Indonesia can see whether the project feasible or not to be executed.

Net Present Value (NPV) is one of the main indicators to be analyze financially, and following by Internal Rate of Return (IRR). If the Net Present Value is in positive result then it is better this project is recommended and executed to make good decision in order greater future cash flow. The result of payback period and profitability index explained also.

4.8.1 Net Present Value & Internal Rate of Return

Based on this financial analysis in table 4.7, we get positive Net present value as Rp. 3.798.620.000, 00 and also Internal Rate of Return as 35%. It means that the sum of present values of the cash in flows generated by investment exceeds the present value of cash out flows, so that it shows that this project is feasible. And also internal rate of return shows that rate of return earned on money greater than the cost of capital. Based on these criteria of IRR, this project is feasible.

4.8.2 Payback Period

In term of payback period we get result 2.11 years meanwhile the project period is ten years, so that based on the criteria of payback period, this project is accepted feasible. The calculation of payback period can be shown in table 4.7. First year until the second year we get negative cash flow, it means that there is still no return of investment. And in 3rd year, we get the positive cumulative of cash flow as Rp. 179,720,000.00, as the calculation below:

Payback period

= 2 years + (Rp. 179.72 million / Rp. 1,667.73 million

= **2.11 years**

4.8.3 Profitability Index

Profitability index measures the rate of feasible of investment based ratio between net present value of cash inflows and initial investment cash outflows. The calculation of profitability index as shown below:

Profitability index

= Rp 19,026.32 million / Rp 4,589.00 million

= **4.15**

The result of profitability index is 4.15 based on this criterion; we can determine the project is feasible to invest.

The projection of cash flow can be seen in appendix 9.

Table 4.7.The summary of NPV, IRR, Payback Period and Profitability Index (in million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,512.68	1,271.27	(3,076.32)
2012	1,588.31	1,211.55	(1,488.01)
2013	1,667.73	1,140.41	179.72
2014	1,751.12	1,056.70	1,930.84
2015	1,838.67	959.17	3,769.51
2016	1,930.60	846.49	5,700.11
2017	2,027.13	717.18	7,727.25
2018	2,128.49	569.66	9,855.74
2019	2,234.92	402.22	12,090.66
2020	2,346.66	213.00	14,437.32
NPV	**3,798.62**		
IRR	**35%**		
Payback Period	**2.11**		
Profitability Index	**4.15**		

Source: Writer analysis

4.9. Real Option

In previous calculation Net present value (NPV) analysis is over other approaches when valuing capital budgeting project. Due to uncertainty factors after a project is accepted we will get the value of the project by calculate some adjustments. This adjustment is called real option.

Assumptions for NPV calculation for the forecast are given based on history data of production order (demand) as *Optimistic forecast* Production order (demand) increase up to 7% yearly, *Pessimistic forecast* Production order (demand) increase only at 1 % yearly. The projection of cash flow can be seen in appendix 10 for optimistic forecast and Appendix 11 for pessimistic forecast. And the calculation result for cash flow shown in table 4.8 and table 4.9.

Table 4.8 Calculation of Cash flow if production order increase up to 7% yearly (in million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,512.68	1,271.27	(3,076.32)
2012	1,710.94	1,305.08	(1,365.38)
2013	1,927.69	1,318.17	562.31
2014	2,164.47	1,306.13	2,726.78
2015	2,422.92	1,263.95	5,149.70
2016	2,704.80	1,185.94	7,854.50
2017	3,012.03	1,065.62	10,866.53
2018	3,346.65	895.68	14,213.18
2019	3,710.90	667.85	17,924.08
2020	4,107.13	372.79	22,031.21
NPV	**6,063.48**		
IRR	**42%**		
Payback Period	**2.29**		
Profitability Index	**5.80**		

Source: Writer analysis

Table 4.9 Calculation of Cash flow if production order increase at 1% yearly (in million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,512.68	1,271.27	(2,578.00)
2012	1,343.06	1,024.47	(566.00)
2013	1,162.51	794.94	1,447.00
2014	970.46	585.62	3,461.00
2015	766.30	399.75	5,476.00
2016	549.41	240.89	7,492.00
2017	319.12	112.90	9,509.00
2018	74.74	20.00	11,527.00
2019	(184.47)	(33.20)	13,546.00
2020	(459.26)	(41.69)	15,566.00
NPV	**(214.05)**		
IRR	**12%**		
Payback Period	**3.24**		
Profitability Index	**1.32**		

Source: Writer analysis

Those above cash flow both optimistic and pessimistic reflected that there is a 50 percent probability will be optimistic and 80 percent probability will be pessimistic condition.

So, we will get the true NPV of the project by an average of the two forecasts as below:

The true NPV = 50% x 6,063.48 + 80% x (214.05)

= 3,031.74 million + (171.24)

= 2,860.50 million

Based on the average of the forecast, we get the positive NPV:

Rp. 2,860,500,000.00

When we conduct the further investigation, reveals there is no option to expand to some other locations both optimistic forecast and also pessimistic forecast.

The NPV = (50% x 6,063.48 + no option) + (80% x (214.05) + no option)

= 3,031.74 million + (171.24) million

= 2,860.50 million

Even this expansion project get positive NPV, PT. Kansai Paint Indonesia still can increase it by one of real option to expand. It's can turn out the optimistic forecast to increase production capacity become 100% starting April in year 2011 and get new cash flow which result positive NPV= Rp. 6,728.84 million as seen below:

Table 4.10 Calculation of Cash flow if production order increase up to 7% yearly with the capacity 100% in April 2011 (in millions)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,625.18	1,365.81	(2,963.82)
2012	1,831.31	1,396.90	(1,132.51)
2013	2,056.50	1,406.25	923.99
2014	2,302.29	1,389.30	3,226.28
2015	2,570.38	1,340.88	5,796.66
2016	2,862.59	1,255.12	8,659.24
2017	3,180.86	1,125.35	11,840.10
2018	3,527.31	944.03	15,367.41
2019	3,904.19	702.64	19,271.60
2020	4,313.96	391.57	23,585.56
NPV	**6,728.84**		
IRR	**45%**		
Payback Period	**2.45**		
Profitability Index	**6.14**		

Source: Writer analysis

And then we can calculate the true NPV of the project would be:

The true NPV = (50% x 6,728.84) + (80% x (214.05))

= 3,364.42 + (171.24)

= 3193.18

Comparison of real option summary analysis shown in table 4.11 below:

Table 4.11 Summary NPV using Real Option

Description (Rp million)	Optimistic (increase 7%)	Pessimistic (increase 1%)	Average	Real Option	New Average
NPV	6,063.48	(214.05)	2,860.50	6,728.84	3193.18

Source: Writer analysis

4.10. Sensitivity Analysis

This project will always face uncertainty and risk in the future to the return of investment. And this project will be sensitive to the change of capacity of production in the beginning of production in the first year.

The purpose of sensitivity analysis is to know the possibility of condition where the capacity of production order not maximum. It can be happened if the condition of the company not same as predicted as before. Writer will analyze sensitivity of increment of production capacity in the beginning first year by calculating back Net present value. The condition will estimate happen as follows:

Scenario 1: Optimistic: Decrease of production capacity:

January 2011 : Production Capacity: 65%
February 2011 : Production Capacity: 70%
March 2011 : Production Capacity: 80%
April 2011 : Production Capacity: 90%
May 2011, up : Production Capacity: 100 %

The projection of cash flow can be seen in appendix 12. And the calculation of cash flow can be shown in table 4.12

Table 4.12 Summary of NPV, IRR, Payback Period and Profitability Index
(In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,597.05	1,342.18	(2,991.95)
2012	1,552.59	1,184.30	(1,439.35)
2013	1,502.18	1,027.20	62.83
2014	1,445.41	872.22	1,508.24
2015	1,381.84	720.86	2,890.08
2016	1,311.02	574.82	4,201.09
2017	1,232.45	436.03	5,433.55
2018	1,145.64	306.61	6,579.19
2019	1,050.04	188.97	7,629.23
2020	945.06	85.78	8,574.29
NPV	**2,149.98**		
IRR	**29%**		
Payback Period	**2.04**		
Profitability Index	**2.87**		

Source: Writer analysis

The projection in scenario 1 get result positive net present value (NPV) as Rp. 2,149,980,000.00, IRR 29 %, payback period 2.04 years and profitability index 2.87.

Based on the analysis of sensitivity in *scenario 1*, the project is **accepted** to invest.

Scenario 2: Normal: Decrease of production capacity:

January 2011 : Production Capacity: 60%

February 2011 : Production Capacity: 70%

March 2011 : Production Capacity: 80%

April 2011 : Production Capacity: 90%

May 2011, up : Production Capacity: 100 %

The calculation of cash flow can be seen in the below table 4.13

Table 4.13 Summary of NPV, IRR, Payback Period dan Profitability Index (In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,412.67	1,187.22	(3,176.33)
2012	1,362.68	1,039.43	(1,813.65)
2013	1,306.57	893.44	(507.08)
2014	1,243.93	750.64	736.85
2015	1,174.31	612.60	1,911.16
2016	1,097.26	481.10	3,008.42
2017	1,012.29	358.14	4,020.71
2018	918.87	245.92	4,939.59
2019	816.46	146.94	5,756.05
2020	704.48	63.94	6,460.53
NPV	**1,190.38**		
IRR	**24%**		
Payback Period	**3.59**		
Profitability Index	**2.41**		

Source: Writer analysis

The projection in scenario 2 also gets result positive net present value as Rp. 1,190,380,000.00, IRR 24%, payback period 3.59 years and profitability index 2.41 Based on the analysis of sensitivity in scenario 2, the project is accepted to invest.

Scenario 3: Pessimistic: Decrease of production capacity:

January 2011 : Production Capacity: 40%

February 2011 : Production Capacity: 50%

March 2011 : Production Capacity: 60%

April 2011 : Production Capacity: 70%

May 2011, up : Production Capacity: 100 %

The projection of cash flow can be seen in appendix 14.

The calculation of cash flow can be seen in the below table 4.14

Table 4.14 Summary NPV, IRR, Payback Period and Profitability Index (In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,007.67	846.85	(3,581.33)
2012	945.53	721.24	(2,635.80)
2013	876.90	599.63	(1,758.90)
2014	801.37	483.58	(957.52)
2015	718.48	374.81	(239.04)
2016	627.76	275.25	388.72
2017	528.70	187.05	917.42
2018	420.77	112.61	1,338.19
2019	303.42	54.61	1,641.61
2020	176.05	15.98	1,817.66
NPV	**(917.39)**		
IRR	**9%**		
Payback Period	**5.62**		
Profitability Index	**1.40**		

Source: Writer analysis

The projection in scenario 3 get result negative net present value as Rp. 917.390,000.00, IRR 9%, payback period 5.62 years and profitability index 1.40.

Based on the analysis of sensitivity in scenario 3, the project should reject to invest.

The summary of sensitivity analysis in table 4.15 as follows:

Table 4.15 Sensitivity Analysis the change of production capacity

Decrease Production Capacity	NPV (million)	IRR	Payback Period (Year)	Profitability Index	Result
Scenario 1	2,149.98	29 %	2.04	2.87	*Accepted*
Scenario 2	1,190.38	24 %	3.59	2.41.	*Accepted*
Scenario 3	(917.39)	9%	5.62	1.40	*Rejected*

Source: Writer analysis

CHAPTER 5
CONCLUSION AND RECOMMENDATION

5.1. Conclusion

From the analysis result that had been done by the writer for this Feasibility study then there a result conclusion and recommendation for PT. Kansai Paint Indonesia to known the expansion planning project in the future. The cost of equity of this project is 18.99 % and all equity financed by the principal Kansai Paint co,ltd from Japan.

1. Based on cash flow projection, this factory expansion have positive Net Present Value as Rp. 3.798.620.000, 00 Internal Rate of Return (IRR) as 35 % , which is exceed the cost of capital; Profitability Index exceeding to 1 as 4.15 ; Payback period is 2.11 years which is less than the period of project 10 years. It means the project is feasible and could be executed as a future investment for PT. Kansai Paint Indonesia..
2. Based on real option analysis, this factory expansion has positive Net Present Value as Rp 2,860,500,000.00. It means that there is no other option to expand to other location both of the optimistic and pessimistic forecast.
3. Based on sensitivity analysis of decrease of production capacity, in order to get Net present value positive and Internal Rate of Return (IRR) greater than cost of capital, the company should maintain the production capacity as follows :

January 2011	: Production Capacity: ≥ 60 %
February 2011	: Production Capacity: ≥ 70 %
March 2011	: Production Capacity: ≥ 80 %
April 2011	: Production Capacity: ≥ 90 %
May, up 2011	: Production Capacity: = 100%

The marketing strategy used to serve PT. Kansai Paint Indonesia target market take into account both buyers and sellers objectives by focusing primarily on the:

- **Product:** For this new product of synthetic resin PT. Kansai Paint Indonesia is focus the new product on the services for technical assistant, warranties and guarantees, good designed package of the products, and also the product features will provide the intended satisfaction better than competitive products. The product would be had benefits for the solution to customer..
- **Promotion:** Focusing on the B2B promotion methods, PT. Kansai Paint Indonesia giving the product information deeply strictly to the customer. The B2B market has a thirst for knowledge and they are information seekers. Be more in-depth with the marketing materials. The most effective marketing message will focus on how the product or service saves the time, money and resources. The business-to-business market is more interested in the logic behind the product. The customer will want to hear more about the features and how it will help them in saving time, money or resources.
- **Price :** While determining an appropriate price level for a product or service is a complicated process, most firms do not charge the same list price to every customer all of the time. Differential pricing occurs when the company sells a product at two or more prices not determined by proportional differences in cost. This is usually done to adjust to differences in the price sensitivities or preferences of various customer segments.
- **Place:** The location PT. Kansai Paint Indonesia could make the decision making by customer. Most of Automotives industry placed in Jakarta which sometimes the production process in 24 hours, Just in Time delivery would be a crucial and important thing to be concerned. Therefore, the distribution component of most marketing program focuses on issues like what types of institution – and how many of each- should be included at each level of the distribution, and how those distribution members can be coordinated and motivated to effectively service

- **Context:** Cut cost that could be excess from this localization would make higher profit for PT. Kansai Paint Indonesia. The Synthetic Resin raw material used for the formula is one of the high percentages to make coating product for automotive industry. Beside for internal consumption this material could sell in local market and also international market.
- **Company:** the Company would focus most on the SWOT analysis, company philosophy, vision and mission.
- **Customer:** Market segmentation is needed because there are a lot of customer with different needed and style that could be a potential buyer to our product, the targeting has already identified as a primary and secondary priority segment. As a primary priority PT. Kansai Paint Indonesia needed for synthetic resin material itself for this product, The position of PT. Kansai Paint Indonesia right now already closely with its target market which is customer that required affordable price with good quality of products
- **Competitor:** Competitors for synthetic resin product for automotive paint industry in Indonesia are come from different company in Indonesia. Some came from other country such as Japan and Thailand, and the other come from local company. This situation could make different decision making of buying product for customer based on the specific strength and weakness of each competitor.

5.2 Recommendation

1. When valuing capital budgeting project, it is suggested better to use real option analysis. Because from a valuation standpoint, these options are valuable because they allow decision makers to react to favorable or unfavorable new situations by dynamically adjusting the capital budgeting decision process for flexibility associated with the project.
2. In term of next planning in the future, one of the real option could be in realization for new product to get more cash flow than previous
3. And from all the financial analysis and also marketing analysis had been conduct by the writer, in order to got another positive cash flow and also to reduce cost of raw material resin PT. Kansai Paint Indonesia fully recommended to expand the factory as a future investment planning. And it would be a good decision made to be executing such of a project.

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Appendix 1

INTEREST RATE BANK OF INDONESIA

RISK FREE

Quarter	Period	Interest Rate
Q1	3 Month	6.50% Issued date : March 2010
Quarter	**Period**	**Interest Rate**
Q2	3 Month	6.50% Issued date : June 2010
Quarter	**Period**	**Interest Rate**
Q3	3 Month	6.50% Issued date : September 2010
Quarter	**Period**	**Interest Rate**
Q4	3 Bulan	7.75% Issued date : December 2010
Average		**6.75 %**

Market Risk Premiums

This table summarizes the latest bond ratings and appropriate default spreads for different countries. While you can use these numbers as rough estimates of country risk premiums, you may want to modify the premium to reflect the additional risk of equity markets. To estimate the long term country risk premium, I start with the country rating (from Moody's: www.moodys.com) and estimate the default spread for that rating (based upon traded country bonds) over a default free government bond rate. This becomes a measure of the added country risk premium for that country. I add this default spread to the historical risk premium for a mature equity market (estimated from US historical data) to estimate the total risk premium. In the short term especially, the equity country risk premium is likely to be greater than the country's default spread. You can estimate an adjusted country risk premium by multiplying the default spread by the relative equity market volatility for that market (Standard deviation in country equity market/Std dev in country bond). I have used the emerging market average of 1.5 (equity markets are about 1.5 times more volatile than bond markets) to estimate country risk premium

Country	Region	Long Term rating	Adj. Default spread	Total Risk Premium (%)	Country Risk Premium (%)
Albania	Eastern Europe & Russia	B1	650	18.75	9.75
Argentina	Central and South America	B3	900	18.50	13.50
Fiji Islands	Asia	Ba2	400	11.00	6.00
Finland (1)	Western Europe	Aaa	0	5.00	0.00
France (1)	Western Europe	Aaa	0	5.00	0.00
Germany (1)	Western Europe	Aaa	0	5.00	0.00
Greece (1)	Western Europe	A1	140	7.00	2.10
Guatemala	Central and South America	Ba1	300	9.50	4.50
Honduras	Central and South America	B2	750	16.25	11.25
Hong Kong	Asia	Aa2	100	6.50	1.50
Hungary	Eastern Europe & Russia	A3	175	7.63	2.63
Iceland	Western Europe	Baa1	200	8.00	3.00
India	Asia	Ba2	400	11.00	6.00
Indonesia	**Asia**	**Ba3**	**525**	**12.88**	**7.88**
Ireland	Western Europe	Aaa	0	5.00	0.00
Isle of man	Financial Center	Aaa	0	5.00	0.00
Israel	Middle East	A1	140	7,10	2.10
Italy	Western Europe	Aa2	100	6.50	1.50

Resources
http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

Beta Coefficient

As a basis for comparison of company BETAs, BETA estimates of groups of companies in the same industry are used. Table T-2.4 below presents industry BETAs for a selected group of industries. As can be expected the industry BETAs are closer to one than the values of individual companies shown in the range of BETAs column. The average of all industry BETAs is naturally one. What is of particular interest in Table T-2.4 is that BETA estimates correspond to what one would expect for each particular industry. For instance, utilities and food industries are less than or equal to one, as one would intuitively assume because their sales and profits are known to be stable. At the other end of the spectrum, growth industries (such as computer software and services) and cyclical industries (such as air transport, home building and autos and trucks) are well above one. Basic products and services such as household products and banking, respectively, are just equal to one.

Ranking of industries by P/E	
Industry	**Beta**
Electricity	0.50
Food	0.75
Beverages	0.80
Oil	0.80
Telephone	0.89
Publishing	0.90
Chemical	**0.95**
Consumer Products	0.98
Retail	0.98
Manufacturing	1.03
Tires	1.03
Pharmaceuticals	1.07
Computers	1.22
Banking	1.34
Internet	1.38
Averages	**1.00**

Source: Beta values compiled using Value Line *Investment Survey* 2000

Appendix 4

MANUFACTURING NEW PRODUCT DEPRECIATION
(In millions)

Description	Investment	Age (year)	Depreciation (year)
Building	2,104.00	5	22.87
Machine	1,450.00	5	15.29
Factory equipment	860.00	5	11.18
Office supplies	110.00	4	2.52
License	400.00	5	0.83
Lay out plant, Office	350.00	5	9.17
Electricity Installation	1,300.00	5	12.67
Delivery of machine	15.00	5	0.17
TOTAL	6,589.00		74.7

Source: Production & Engineering Department 2010

Manufacturing New Product		YEAR 2011 GENERAL AND ADMINISTRATION COST (in million Rupiah)												
No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
		Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp
1	Salary (Monthly)	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	240,00
2	Transportation Allowance	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	60,00
3	Meal Allowance	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	19,80
4	Hand phone Allowance	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	36,00
5	T H R									41,80				41,80
6	Office Supply	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	30,00
7	Telephone & fax	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	36,00
8	Administration Bank	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	48,00
9	Social Allowance	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	1,50	34,50
10	Car Rent	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	84,00
11	Fire Insurance	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	36,00
12	PPH 21	7,60	7,60	7,60	7,60	7,60	7,60	7,60	7,60	7,60	7,60	7,60	7,60	91,20
13	Sample Purchase	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	36,00
14	Recruitment, training	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	60,00
15	Healthy Insurance	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	72,00
16	Uniform Employee	50,00					50,00							100,00
17	Office supplies maintenance	3,00		3,00		3,00		3,00		3,00		3,00		18,00
18	Product development	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	36,00
19	Water	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	7,00	84,00
20	Logistic Rent	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	72,00
21	Security equipment	4,00					2,80							6,80
22	Depreciation	3,60	3,60	3,60	3,60	3,60	3,60	3,60	3,60	3,60	3,60	3,60	3,60	43,20
TOTAL		**150,35**	**93,35**	**96,35**	**93,35**	**96,35**	**146,15**	**96,35**	**93,35**	**138,15**	**93,35**	**96,35**	**91,85**	**1.285,30**

MANUFACTURING NEW PRODUCT		GENERAL AND ADMINISTRATION COST (in million Rupiah)										
No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	TOTAL
		Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp
1	Salary (Monthly)	240,00	254,40	269,66	285,84	302,99	321,17	340,44	360,87	382,52	405,47	**3.163,39**
2	Transportation Allowance	60,00	63,60	67,42	71,46	75,75	80,29	85,11	90,22	95,63	101,37	**790,85**
3	Meal Allowance	19,80	20,99	22,25	23,58	25,00	26,50	28,09	29,77	31,56	33,45	**260,98**
4	Hand phone Allowance	36,00	38,16	40,45	42,88	45,45	48,18	51,07	54,13	57,38	60,82	**474,51**
5	T H R	41,80	44,31	46,97	49,78	52,77	55,94	59,29	62,85	66,62	70,62	**550,96**
6	Office Supply	30,00	31,80	33,71	35,73	37,87	40,15	42,56	45,11	47,82	50,68	**395,42**
7	Telephone & fax	36,00	38,16	40,45	42,88	45,45	48,18	51,07	54,13	57,38	60,82	**474,51**
8	Administration Bank	48,00	50,88	53,93	57,17	60,60	64,23	68,09	72,17	76,50	81,09	**632,68**
9	Social Allowance	34,50	36,57	38,76	41,09	43,56	46,17	48,94	51,88	54,99	58,29	**454,74**
10	Car Rent	84,00	89,04	94,38	100,05	106,05	112,41	119,16	126,30	133,88	141,92	**1.107,19**
11	Fire Insurance	36,00	38,16	40,45	42,88	45,45	48,18	51,07	54,13	57,38	60,82	**474,51**
12	PPH 21	91,20	96,67	102,47	108,62	115,14	122,05	129,37	137,13	145,36	154,08	**1.202,09**
13	Sample Purchase	36,00	38,16	40,45	42,88	45,45	48,18	51,07	54,13	57,38	60,82	**474,51**
14	Recruitment, training	60,00	63,60	67,42	71,46	75,75	80,29	85,11	90,22	95,63	101,37	**790,85**
15	Healthy Insurance	72,00	76,32	80,90	85,75	90,90	96,35	102,13	108,26	114,76	121,64	**949,02**
16	Uniform Employee	100,00	106,00	112,36	119,10	126,25	133,82	141,85	150,36	159,38	168,95	**1.318,08**
17	Office supplies maintenance	18,00	19,08	20,22	21,44	22,72	24,09	25,53	27,07	28,69	30,41	**237,25**
18	Product development	36,00	38,16	40,45	42,88	45,45	48,18	51,07	54,13	57,38	60,82	**474,51**
19	Water	84,00	89,04	94,38	100,05	106,05	112,41	119,16	126,30	133,88	141,92	**1.107,19**
20	Logistic Rent	72,00	76,32	80,90	85,75	90,90	96,35	102,13	108,26	114,76	121,64	**949,02**
21	Security equipment	6,80	7,21	7,64	8,10	8,58	9,10	9,65	10,22	10,84	11,49	**89,63**
22	Depreciation	43,20	45,79	48,54	51,45	54,54	57,81	61,28	64,96	68,85	72,99	**569,41**
TOTAL		**1.285,30**	**1.362,42**	**1.444,16**	**1.530,81**	**1.622,66**	**1.720,02**	**1.823,22**	**1.932,62**	**2.048,57**	**2.171,49**	**16.941,28**

YEAR 2011

Manufacturing New Product

PRODUCTION COST (in million Rupiah)

No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
		Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp
	OUTPUT	**2.250,00**	**2.625,00**	**3.000,00**	**3.375,00**	**3.375,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**40.875,00**
I	**MATERIAL COST 90%**	**2.025,00**	**2.362,50**	2.700,00	**3.037,50**	**3.037,50**	**3.375,00**	**3.375,00**	3.375,00	**3.375,00**	3.375,00	**3.375,00**	**3.375,00**	**36.787,50**
II	**DIRECT LABOUR**													
1	Salary	140,00	126,45	140,00	139,97	140,00	139,97	140,00	140,00	139,97	140,00	139,97	140,00	1.666,32
2	Overtime													
3	Transport Allowance													
4	Meal allowance													
5	THR									81,90				81,90
6	Shift Allowance	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	18,84
	TOTAL DLC	**141,57**	**128,02**	**141,57**	**141,54**	**141,57**	**141,54**	**141,57**	**141,57**	**223,44**	**141,57**	**141,54**	**141,57**	**1.767,06**
III	**FACTORY OVERHEAD**													
1	Salary	18,50	16,71	18,50	18,47	18,50	18,47	18,50	18,50	18,47	18,50	18,47	18,50	220,08
2	Overtime cost													
3	Transport Allowance	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	15,60
4	Meal Allowance	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	20,40
5	THR									23,52				23,52
6	Shift Allowance	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,24
7	Hand phone facility	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	9,60
8	Office supplies	1,00	1,00	1,67	1,86	1,00	1,67	1,64	1,71	1,78	1,84	1,91	1,98	19,05
9	Official transport allowance	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	6,00
10	Electricity	11,20	12,54	14,05	14,00	16,10	16,10	16,10	16,10	16,10	10,87	16,10	10,87	170,16
11	Fuel	2,54	2,84	3,19	3,14	3,61	3,61	3,61	3,61	3,61	2,84	3,61	2,84	39,06
12	Tooling	2,64	2,96	3,31	3,27	3,76	3,76	3,76	3,76	3,76	3,84	3,76	3,84	42,39
13	Maintenance	2,30	2,58	2,89	2,84	3,26	3,26	3,26	3,26	3,26	4,84	3,26	4,84	39,87
14	Spare parts	9,34	10,46	11,72	11,67	13,42	13,42	13,42	13,42	13,42	5,84	13,42	5,84	135,39
15	Utility	0,67	0,75	0,84	0,79	0,91	0,91	0,91	0,91	0,91	6,84	0,91	6,84	22,22
16	Production support	1,48	1,66	1,86	1,81	2,08	2,08	2,08	2,08	2,08	7,84	2,08	7,84	34,98
17	Lab Support	0,50	0,50	0,56	0,51	0,59	0,59	0,59	0,59	0,59	8,84	0,59	8,84	23,30
18	Depreciation	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	459,00
19	Safety	1,00	1,12	2,00	2,20	3,68	3,00	3,50	3,68	3,86	3,78	3,68	3,87	35,37
	TOTAL FOH	**93,74**	**95,69**	**103,15**	**103,13**	**109,49**	**109,45**	**109,95**	**110,20**	**133,93**	**118,44**	**110,37**	**118,67**	**1.316,21**
	PRODUCTION COST	**2.260,31**	**2.586,21**	**2.944,72**	**3.282,17**	**3.288,56**	**3.625,99**	**3.626,52**	**3.626,77**	**3.732,37**	**3.635,01**	**3.626,91**	**3.635,24**	**39.870,77**

MANUFACTURING NEW PRODUCT		YEAR 2011 PROFIT (LOSS) PROJECTION (in million Rupiah)												
No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
		Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp	Rp
1	Sales	2.475,00	2.887,50	3.300,00	3.712,50	3.712,50	4.125,00	4.125,00	4.125,00	4.125,00	4.125,00	4.125,00	4.125,00	44.962,50
2	Production Cost	(2.260,31)	(2.586,21)	(2.944,72)	(3.282,17)	(3.288,56)	(3.625,99)	(3.626,52)	(3.626,77)	(3.732,37)	(3.635,01)	(3.626,91)	(3.635,24)	(39.870,77)
3	Gross profit (Loss)	214,69	301,29	355,28	430,33	423,94	499,01	498,48	498,23	392,63	489,99	498,09	489,76	5.091,73
4	Operating Expense													
	- General & Administration Cost	(150,35)	(93,35)	(96,35)	(93,35)	(96,35)	(146,15)	(96,35)	(93,35)	(138,15)	(93,35)	(96,35)	(91,85)	(1.285,30)
	- Logistic	(21,71)	(13,48)	(13,91)	(13,48)	(13,91)	(21,10)	(13,91)	(13,48)	(19,95)	(13,48)	(13,91)	(13,26)	(185,60)
	Total Operating Expense	(172,06)	(106,83)	(110,26)	(106,83)	(110,26)	(167,25)	(110,26)	(106,83)	(158,10)	(106,83)	(110,26)	(105,11)	(1.470,90)
5	Profit (Loss) from Operational	42,63	194,46	245,02	323,50	313,68	331,76	388,21	391,40	234,53	383,16	387,83	384,65	3.620,83

The Summary of NPV, IRR payback period
If Output increase 5 % yearly
(In millions)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,512.68	1,271.27	(3,076.32)
2012	1,588.31	1,211.55	(1,488.01)
2013	1,667.73	1,140.41	179.72
2014	1,751.12	1,056.70	1,930.84
2015	1,838.67	959.17	3,769.51
2016	1,930.60	846.49	5,700.11
2017	2,027.13	717.18	7,727.25
2018	2,128.49	569.66	9,855.74
2019	2,234.92	402.22	12,090.66
2020	2,346.66	213.00	14,437.32
NPV	**3,798.62**		
IRR	**35%**		
Payback Period	**2.11**		
Profitability Index	**4.15**		

MANUFACTURING NEW PRODUCT
CASH FLOW PROJECTION
(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		42.918,75	45.064,69	47.317,92	49.683,82	52.168,01	54.776,41	57.515,23	60.390,99	63.410,54	66.581,07
Total		**42.918,75**	45.064,69	47.317,92	**49.683,82**	**52.168,01**	**54.776,41**	57.515,23	**60.390,99**	**63.410,54**	**66.581,07**
Operating Expense											
Raw Material		(36.787,50)	(38.626,88)	(40.558,22)	(42.586,13)	(44.715,44)	(46.951,21)	(49.298,77)	(51.763,71)	(54.351,89)	(57.069,49)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382,03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194,88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		**(41.406,07)**	**(43.476,37)**	**(45.650,19)**	(47.932,70)	**(50.329,34)**	**(52.845,80)**	**(55.488,09)**	**(58.262,50)**	**(61.175,62)**	**(64.234,41)**
Cash flow from operational activities		**1.512,68**	**1.588,31**	1.667,73	**1.751,12**	1.838,67	1.930,60	**2.027,13**	2.128,49	**2.234,92**	**2.346,66**
Investment											
Capital Expenditure	**(4.589,00)**										
Cash flow from investment	**(4.589,00)**										
Net Cash Flow	**(4.589,00)**	**1.512,68**	**1.588,31**	**1.667,73**	**1.751,12**	**1.838,67**	**1.930,60**	**2.027,13**	**2.128,49**	**2.234,92**	**2.346,66**

MANUFACTURING NEW PRODUCT

PROFIT (LOSS) PROJECTION

(in million Rupiah)

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	**Sales**	**42.918,75**	45.064,69	**47.317,92**	**49.683,82**	**52.168,01**	**54.776,41**	**57.515,23**	60.390,99	63.410,54	66.581,07	**539.827,43**
2	**Production Cost**	**(39.935,17)**	(41.931,93)	**(44.028,53)**	(46.229,96)	**(48.541,45)**	**(50.968,53)**	**(53.516,95)**	(56.192,80)	(59.002,44)	**(61.952,56)**	**(502.300,32)**
3	**Gross profit (Loss)**	**2.983,58**	**3.132,76**	**3.289,39**	**3.453,86**	3.626,56	**3.807,88**	**3.998,28**	**4.198,19**	**4.408,10**	**4.628,51**	**37.527,11**
4	**Operating Expense**											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	**(1.023,28)**	**(1.083,38)**	**(1.147,03)**	**(1.214,43)**	**(1.285,80)**	**(1.361,38)**	**(1.441,41)**	(1.526,17)	**(1.615,92)**	**(1.710,97)**	**(13.409,76)**
5	**Profit (Loss) from Operational**	**1.960,30**	**2.049,37**	**2.142,36**	**2.239,44**	**2.340,76**	**2.446,51**	**2.556,87**	**2.672,03**	**2.792,18**	**2.917,54**	**24.117,35**

Manufacturing New Product

MANUFACTURING NEW PRODUCT
PRODUCTION COST 10 years (in million Rupiah)

Appendix 9d

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	40.875,00	42.918,75	45.064,69	47.317,92	49.683,82	52.168,01	54.776,41	57.515,23	60.390,99	63.410,54	514.121,36
I	MATERIAL COST 90%	36.787,50	38.626,88	40.558,22	42.586,13	44.715,44	46.951,21	49.298,77	51.763,71	54.351,89	57.069,49	462.709,22
II	DIRECT LABOUR											
1	Salary	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	20.958,78
2	Overtime											
3	Transport Allowance											
4	Meal allowance											
5	T H R	146,30	153,62	161,30	169,36	177,83	186,72	196,06	205,86	216,15	226,96	1.840,15
6	Shift Allowance	18,84	19,78	20,77	21,81	22,90	24,05	25,25	26,51	27,84	29,23	236,97
	TOTAL DLC	1.831,46	1.923,03	2.019,18	2.120,14	2.226,15	2.337,46	2.454,33	2.577,05	2.705,90	2.841,19	23.035,89
III	FACTORY OVERHEAD											
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	2.768,14
2	Overtime cost											
3	Transport Allowance	15,60	16,38	17,20	18,06	18,96	19,91	20,91	21,95	23,05	24,20	196,22
4	Meal Allowance	20,40	21,42	22,49	23,62	24,80	26,04	27,34	28,70	30,14	31,65	256,59
5	T H R	23,52	24,70	25,93	27,23	28,59	30,02	31,52	33,10	34,75	36,49	295,83
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	3,02
7	Hand phone facility	9,60	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	120,75
8	Office supplies	19,05	20,00	21,00	22,05	23,16	24,31	25,53	26,81	28,15	29,55	239,62
9	Official transport allowance	6,00	6,30	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	75,47
10	Electricity	170,16	178,67	187,60	196,98	206,83	217,17	228,03	239,43	251,40	263,97	2.140,23
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	491,26
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,10	56,80	59,64	62,62	65,75	533,13
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,10	58,91	61,85	501,47
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,80	181,44	190,51	200,03	210,03	1.702,92
15	Utility	22,22	23,33	24,49	25,72	27,00	28,35	29,77	31,26	32,82	34,46	279,43
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	439,93
17	Lab Support	23,30	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	293,06
18	Depreciation	459,00	481,95	506,05	531,35	557,92	585,81	615,10	645,86	678,15	712,06	5.773,25
19	Safety	35,37	37,14	39,00	40,95	42,99	45,14	47,40	49,77	52,26	54,87	444,88
	TOTAL FOH	1.316,21	1.382,03	1.451,13	1.523,68	1.599,87	1.679,86	1.763,85	1.852,05	1.944,65	2.041,88	16.555,21
	PRODUCTION COST	39.935,17	41.931,93	44.028,53	46.229,96	48.541,45	50.968,53	53.516,95	56.192,80	59.002,44	61.952,56	502.300,32

Appendix 10a

The Summary of NPV, IRR payback period
Real Option Optimistic scenario
(In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,512.68	1,271.27	(3,076.32)
2012	1,710.94	1,305.08	(1,365.38)
2013	1,927.69	1,318.17	562.31
2014	2,164.47	1,306.13	2,726.78
2015	2,422.92	1,263.95	5,149.70
2016	2,704.80	1,185.94	7,854.50
2017	3,012.03	1,065.62	10,866.53
2018	3,346.65	895.68	14,213.18
2019	3,710.90	667.85	17,924.08
2020	4,107.13	372.79	22,031.21
NPV	6,063.48		
IRR	42%		
Payback Period	2.29		
Profitability Index	5.80		

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario)

CASH FLOW PROJECTION

(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		42.918,75	45.923,06	49.137,68	52.577,31	56.257,73	60.195,77	64.409,47	68.918,13	73.742,40	78.904,37
Total		**42.918,75**	**45.923,06**	**49.137,68**	**52.577,31**	**56.257,73**	**60.195,77**	**64.409,47**	**68.918,13**	**73.742,40**	**78.904,37**
Operating Expense											
Raw Material		(36.787,50)	(39.362,63)	(42.118,01)	(45.066,27)	(48.220,91)	(51.596,37)	(55.208,12)	(59.072,69)	(63.207,77)	(67.632,32)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382,03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194,88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		**(41.406,07)**	**(44.212,12)**	**(47.209,98)**	(50.412,84)	**(53.834,81)**	**(57.490,97)**	**(61.397,44)**	**(65.571,48)**	**(70.031,51)**	**(74.797,24)**
Cash flow from operational activities		**1.512,68**	**1.710,94**	**1.927,69**	**2.164,47**	**2.422,92**	**2.704,80**	**3.012,03**	**3.346,65**	**3.710,90**	**4.107,13**
Investment											
Capital Expenditure	**(4.589,00)**										
Cash flow from investment	**(4.589,00)**										
Net Cash Flow	**(4.589,00)**	**1.512,68**	**1.710,94**	**1.927,69**	**2.164,47**	**2.422,92**	**2.704,80**	**3.012,03**	**3.346,65**	**3.710,90**	**4.107,13**

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario)

PROFIT (LOSS) PROJECTION

(in million Rupiah)

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	**Sales**	**42.918,75**	**45.923,06**	**49.137,68**	**52.577,31**	**56.257,73**	**60.195,77**	**64.409,47**	**68.918,13**	**73.742,40**	**78.904,37**	**592.984,68**
2	**Production Cost**	**(36.787,50)**	**(39.362,63)**	**(42.118,01)**	**(45.066,27)**	**(48.220,91)**	**(51.596,37)**	**(55.208,12)**	**(59.072,69)**	**(63.207,77)**	**(67.632,32)**	**(508.272,58)**
3	**Gross profit (Loss)**	**6.131,25**	**6.560,44**	**7.019,67**	**7.511,04**	**8.036,82**	**8.599,40**	**9.201,35**	**9.845,45**	**10.534,63**	**11.272,05**	**84.712,10**
4	**Operating Expense**											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	**(1.023,28)**	**(1.083,38)**	**(1.147,03)**	**(1.214,43)**	**(1.285,80)**	**(1.361,38)**	**(1.441,41)**	**(1.526,17)**	**(1.615,92)**	**(1.710,97)**	**(13.409,76)**
5	**Profit (Loss) from Operational**	**5.107,97**	**5.477,06**	**5.872,64**	**6.296,62**	**6.751,02**	**7.238,02**	**7.759,94**	**8.319,28**	**8.918,71**	**9.561,09**	**71.302,34**

MANUFACTURING NEW PRODUCT
PRODUCTION COST 10 years (in million Rupiah)

Appendix 10d

No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	**40.875,00**	**43.736,25**	**46.797,79**	**50.073,63**	**53.578,79**	**57.329,30**	**61.342,35**	**65.636,32**	**70.230,86**	**75.147,02**	**564.747,31**
I	**MATERIAL COST 90%**	**36.787,50**	**39.362,63**	**42.118,01**	**45.066,27**	**48.220,91**	**51.596,37**	**55.208,12**	**59.072,69**	**63.207,77**	**67.632,32**	**508.272,58**
1	Salary (Direct Labor Cost)	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	**20.958,78**
2	T H R	146,3	153,62	161,3	169,36	177,83	186,72	196,06	205,86	216,15	226,96	**1.840,15**
3	Shift Allowance	18,84	19,78	20,77	21,81	22,9	24,05	25,25	26,51	27,84	29,23	**236,97**
	TOTAL DLC	**1.831,46**	**1.923,03**	**2.019,18**	**2.120,14**	**2.226,15**	**2.337,46**	**2.454,33**	**2.577,05**	**2.705,90**	**2.841,19**	**23.035,89**
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	**2.768,14**
3	Transport Allowance	15,6	16,38	17,2	18,06	18,96	19,91	20,91	21,95	23,05	24,2	**196,22**
4	Meal Allowance	20,4	21,42	22,49	23,62	24,8	26,04	27,34	28,7	30,14	31,65	**256,59**
5	T H R	23,52	24,7	25,93	27,23	28,59	30,02	31,52	33,1	34,75	36,49	**295,83**
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	**3,02**
7	Hand phone facility	9,6	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	**120,75**
8	Office supplies	19,05	20	21	22,05	23,16	24,31	25,53	26,81	28,15	29,55	**239,62**
9	Official transport allowance	6	6,3	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	**75,47**
10	Electricity	170,16	178,67	187,6	196,98	206,83	217,17	228,03	239,43	251,4	263,97	**2.140,23**
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	**491,26**
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,1	56,8	59,64	62,62	65,75	**533,13**
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,1	58,91	61,85	**501,47**
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,8	181,44	190,51	200,03	210,03	**1.702,92**
15	Utility	22,22	23,33	24,49	25,72	27	28,35	29,77	31,26	32,82	34,46	**279,43**
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	**439,93**
17	Lab Support	23,3	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	**293,06**
18	Depreciation	459	481,95	506,05	531,35	557,92	585,81	615,1	645,86	678,15	712,06	**5.773,25**
19	Safety	35,37	37,14	39	40,95	42,99	45,14	47,4	49,77	52,26	54,87	**444,88**
	TOTAL FOH	**1.316,21**	**1.382,03**	**1.451,13**	**1.523,68**	**1.599,87**	**1.679,86**	**1.763,85**	**1.852,05**	**1.944,65**	**2.041,88**	**16.555,21**
	PRODUCTION COST	**39.935,17**	**42.667,68**	**45.588,32**	**48.710,09**	**52.046,92**	**55.613,69**	**59.426,30**	**63.501,78**	**67.858,32**	**72.515,39**	**547.863,68**

Appendix 11a

The Summary of NPV, IRR payback period
Real Option Pessimistic scenario
(In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,512.68	1,271.27	(2,578.00)
2012	1,343.06	1,024.47	(566.00)
2013	1,162.51	794.94	1,447.00
2014	970.46	585.62	3,461.00
2015	766.30	399.75	5,476.00
2016	549.41	240.89	7,492.00
2017	319.12	112.90	9,509.00
2018	74.74	20.00	11,527.00
2019	(184.47)	(33.20)	13,546.00
2020	(459.26)	(41.69)	15,566.00
NPV	**(214.05)**		
IRR	**12%**		
Payback Period	**3.24**		
Profitability Index	**1.32**		

MANUFACTURING NEW PRODUCT (Real Option Pessimistic Scenario)

CASH FLOW PROJECTION

(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		42.918,75	43.347,94	43.781,42	44.219,23	44.661,42	45.108,04	45.559,12	46.014,71	46.474,86	46.939,60
Total		**42.918,75**	**43.347,94**	**43.781,42**	44.219,23	**44.661,42**	**45.108,04**	**45.559,12**	**46.014,71**	**46.474,86**	**46.939,60**
Operating Expense											
Raw Material		(36.787,50)	(37.155,38)	(37.526,93)	(37.902,20)	(38.281,22)	(38.664,03)	(39.050,67)	(39.441,18)	(39.835,59)	(40.233,95)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382,03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194,88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		**(41.406,07)**	**(42.004,87)**	**(42.618,90)**	**(43.248,77)**	**(43.895,12)**	**(44.558,63)**	**(45.240,00)**	**(45.939,97)**	**(46.659,32)**	**(47.398,87)**
Cash flow from operational activities		**1.512,68**	**1.343,06**	**1.162,51**	970,46	**766,30**	**549,41**	**319,12**	**74,74**	**(184,47)**	**(459,26)**
Investment											
Capital Expenditure	**(4.589,00)**										
Cash flow from investment	**(4.589,00)**										
Net Cash Flow	**(4.589,00)**	**1.512,68**	**1.343,06**	**1.162,51**	**970,46**	**766,30**	549,41	**319,12**	**74,74**	**(184,47)**	**(459,26)**

MANUFACTURING NEW PRODUCT (Real Option Pessimistic Scenario)

PROFIT (LOSS) PROJECTION

(in million Rupiah)

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	**Sales**	42.918,75	43.347,94	43.781,42	44.219,23	44.661,42	45.108,04	45.559,12	46.014,71	46.474,86	46.939,60	449.025,08
2	**Production Cost**	(39.935,17)	(40.460,43)	(40.997,24)	(41.546,02)	(42.107,24)	(42.681,35)	(43.268,86)	(43.870,27)	(44.486,14)	(45.117,02)	(424.469,74)
3	**Gross profit (Loss)**	2.983,58	2.887,51	2.784,18	2.673,21	2.554,19	2.426,69	2.290,26	2.144,44	1.988,72	1.822,58	24.555,34
4	**Operating Expense**											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	(1.023,28)	(1.083,38)	(1.147,03)	(1.214,43)	(1.285,80)	(1.361,38)	(1.441,41)	(1.526,17)	(1.615,92)	(1.710,97)	(13.409,76)
5	**Profit (Loss) from Operational**	1.960,30	1.804,12	1.637,15	1.458,78	1.268,39	1.065,31	848,85	618,27	372,80	111,62	11.145,59

MANUFACTURING NEW PRODUCT (Real Option Pessimistic Scenario)
PRODUCTION COST 10 YEARS

No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	40.875,00	41.283,75	41.696,59	42.113,55	42.534,69	42.960,04	43.389,64	43.823,53	44.261,77	44.704,39	427.642,94
I	MATERIAL COST 90%	36.787,50	37.155,38	37.526,93	37.902,20	38.281,22	38.664,03	39.050,67	39.441,18	39.835,59	40.233,95	384.878,64
1	Salary	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	20.958,78
2	T H R	146,30	153,62	161,30	169,36	177,83	186,72	196,06	205,86	216,15	226,96	1.840,15
3	Shift Allowance	18,84	19,78	20,77	21,81	22,90	24,05	25,25	26,51	27,84	29,23	236,97
	TOTAL DLC	1.831,46	1.923,03	2.019,18	2.120,14	2.226,15	2.337,46	2.454,33	2.577,05	2.705,90	2.841,19	23.035,89
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	2.768,14
3	Transport Allowance	15,60	16,38	17,20	18,06	18,96	19,91	20,91	21,95	23,05	24,20	196,22
4	Meal Allowance	20,40	21,42	22,49	23,62	24,80	26,04	27,34	28,70	30,14	31,65	256,59
5	T H R	23,52	24,70	25,93	27,23	28,59	30,02	31,52	33,10	34,75	36,49	295,83
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	3,02
7	Hand phone facility	9,60	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	120,75
8	Office supplies	19,05	20,00	21,00	22,05	23,16	24,31	25,53	26,81	28,15	29,55	239,62
9	Official transport allowance	6,00	6,30	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	75,47
10	Electricity	170,16	178,67	187,60	196,98	206,83	217,17	228,03	239,43	251,40	263,97	2.140,23
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	491,26
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,10	56,80	59,64	62,62	65,75	533,13
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,10	58,91	61,85	501,47
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,80	181,44	190,51	200,03	210,03	1.702,92
15	Utility	22,22	23,33	24,49	25,72	27,00	28,35	29,77	31,26	32,82	34,46	279,43
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	439,93
17	Lab Support	23,30	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	293,06
18	Depreeiation	459,00	481,95	506,05	531,35	557,92	585,81	615,10	645,86	678,15	712,06	5.773,25
19	Safety	35,37	37,14	39,00	40,95	42,99	45,14	47,40	49,77	52,26	54,87	444,88
	TOTAL FOH	1.316,21	1.382,03	1.451,13	1.523,68	1.599,87	1.679,86	1.763,85	1.852,05	1.944,65	2.041,88	16.555,21
	PRODUCTION COST	39.935,17	40.460,43	40.997,24	41.546,02	42.107,24	42.681,35	43.268,86	43.870,27	44.486,14	45.117,02	424.469,74

The Summary of NPV, IRR payback period
Sensitivity Analysis Optimistic scenario
(In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,597.05	1,342.18	(2,991.95)
2012	1,552.59	1,184.30	(1,439.35)
2013	1,502.18	1,027.20	62.83
2014	1,445.41	872.22	1,508.24
2015	1,381.84	720.86	2,890.08
2016	1,311.02	574.82	4,201.09
2017	1,232.45	436.03	5,433.55
2018	1,145.64	306.61	6,579.19
2019	1,050.04	188.97	7,629.23
2020	945.06	85.78	8,574.29
NPV	**2,149.98**		
IRR	**29%**		
Payback Period	**2.04**		
Profitability Index	**2.87**		

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Optimistic Scenario)

CASH FLOW PROJECTION

(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		43.509,38	44.814,66	46.159,10	47.543,87	48.970,18	50.439,29	51.952,47	53.511,04	55.116,37	56.769,87
Total		**43.509,38**	**44.814,66**	**46.159,10**	**47.543,87**	**48.970,18**	**50.439,29**	**51.952,47**	**53.511,04**	**55.116,37**	**56.769,87**
Operating Expense											
Raw Material		(37.293,75)	(38.412,56)	(39.564,94)	(40.751,89)	(41.974,44)	(43.233,68)	(44.530,69)	(45.866,61)	(47.242,61)	(48.659,88)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382,03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194,88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		**(41.912,32)**	**(43.262,06)**	**(44.656,91)**	(46.098,46)	**(47.588,35)**	(49.128,27)	**(50.720,01)**	**(52.365,40)**	**(54.066,34)**	**(55.824,80)**
Cash flow from operational activities		**1.597,05**	**1.552,59**	**1.502,18**	**1.445,41**	**1.381,84**	**1.311,02**	**1.232,45**	**1.145,64**	**1.050,04**	**945,06**
Investment											
Capital Expenditure	**(4.589,00)**										
Cash flow from investment	**(4.589,00)**										
Net Cash Flow	**(4.589,00)**	1.597,05	**1.552,59**	**1.502,18**	**1.445,41**	**1.381,84**	**1.311,02**	1.232,45	1.145,64	**1.050,04**	945,06

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Optimistic Scenario)
PROFIT (LOSS) PROJECTION
(in million Rupiah)

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	Sales	43.509,38	44.814,66	46.159,10	47.543,87	48.970,18	50.439,29	51.952,47	53.511,04	55.116,37	56.769,87	498.786,22
2	Production Cost	(40.441,42)	(41.717,62)	(43.035,25)	(44.395,71)	(45.800,46)	(47.251,00)	(48.748,87)	(50.295,70)	(51.893,15)	(53.542,96)	(467.122,15)
3	Gross profit (Loss)	3.067,95	3.097,04	3.123,85	3.148,16	3.169,72	3.188,30	3.203,60	3.215,34	3.223,22	3.226,91	31.664,08
4	Operating Expense											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	(1.023,28)	(1.083,38)	(1.147,03)	(1.214,43)	(1.285,80)	(1.361,38)	(1.441,41)	(1.526,17)	(1.615,92)	(1.710,97)	(13.409,76)
5	Profit (Loss) from Operational	2.044,67	2.013,65	1.976,82	1.933,73	1.883,93	1.826,92	1.762,19	1.689,18	1.607,30	1.515,94	18.254,32

Appendix 12d

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario)
PRODUCTION COST 10 YEARS

No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	**41.437,50**	**42.680,63**	**43.961,04**	**45.279,88**	**46.638,27**	**48.037,42**	**49.478,54**	**50.962,90**	**52.491,79**	**54.066,54**	**475.034,50**
I	**MATERIAL COST 90%**	**37.293,75**	**38.412,56**	**39.564,94**	**40.751,89**	**41.974,44**	**43.233,68**	**44.530,69**	**45.866,61**	**47.242,61**	**48.659,88**	**427.531,05**
1	Salary	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	**20.958,78**
5	T H R	146,30	153,62	161,30	169,36	177,83	186,72	196,06	205,86	216,15	226,96	**1.840,15**
6	Shift Allowance	18,84	19,78	20,77	21,81	22,90	24,05	25,25	26,51	27,84	29,23	**236,97**
	TOTAL DLC	**1.831,46**	**1.923,03**	**2.019,18**	**2.120,14**	**2.226,15**	**2.337,46**	**2.454,33**	**2.577,05**	**2.705,90**	**2.841,19**	**23.035,89**
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	**2.768,14**
2	Overtime cost											
3	Transport Allowance	15,60	16,38	17,20	18,06	18,96	19,91	20,91	21,95	23,05	24,20	**196,22**
4	Meal Allowance	20,40	21,42	22,49	23,62	24,80	26,04	27,34	28,70	30,14	31,65	**256,59**
5	T H R	23,52	24,70	25,93	27,23	28,59	30,02	31,52	33,10	34,75	36,49	**295,83**
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	**3,02**
7	Hand phone facility	9,60	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	**120,75**
8	Office supplies	19,05	20,00	21,00	22,05	23,16	24,31	25,53	26,81	28,15	29,55	**239,62**
9	Official transport	6,00	6,30	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	**75,47**
10	Electricity	170,16	178,67	187,60	196,98	206,83	217,17	228,03	239,43	251,40	263,97	**2.140,23**
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	**491,26**
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,10	56,80	59,64	62,62	65,75	**533,13**
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,10	58,91	61,85	**501,47**
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,80	181,44	190,51	200,03	210,03	**1.702,92**
15	Utility	22,22	23,33	24,49	25,72	27,00	28,35	29,77	31,26	32,82	34,46	**279,43**
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	**439,93**
17	Lab Support	23,30	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	**293,06**
18	Depreciation	459,00	481,95	506,05	531,35	557,92	585,81	615,10	645,86	678,15	712,06	**5.773,25**
19	Safety	35,37	37,14	39,00	40,95	42,99	45,14	47,40	49,77	52,26	54,87	**444,88**
	TOTAL FOH	**1.316,21**	**1.382,03**	**1.451,13**	**1.523,68**	**1.599,87**	**1.679,86**	**1.763,85**	**1.852,05**	**1.944,65**	**2.041,88**	**16.555,21**
	PRODUCTION COST	**40.441,42**	**41.717,62**	**43.035,25**	**44.395,71**	**45.800,46**	**47.251,00**	**48.748,87**	**50.295,70**	**51.893,15**	**53.542,96**	**467.122,15**

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario)
PRODUCTION COST 2011

No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
	OUTPUT	**2.437,50**	**2.625,00**	**3.000,00**	**3.375,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**41.437,50**
I	**MATERIAL COST 90%**	**2.193,75**	**2.362,50**	**2.700,00**	**3.037,50**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**37.293,75**
1	Salary	140,00	126,45	140,00	139,97	140,00	139,97	140,00	140,00	139,97	140,00	139,97	140,00	1.666,32
2	Shift Allowance	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	18,84
	TOTAL DLC	**141,57**	**128,02**	**141,57**	**141,54**	**141,57**	**141,54**	**141,57**	**141,57**	**223,44**	**141,57**	**141,54**	**141,57**	**1.767,06**
III	**FACTORY OVERHEAD**													
1	Salary	18,50	16,71	18,50	18,47	18,50	18,47	18,50	18,50	18,47	18,50	18,47	18,50	220,08
2	Overtime cost													
3	Transport Allowance	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	15,60
4	Meal Allowance	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	20,40
6	Shift Allowance	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,24
7	Hand phone facility	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	9,60
8	Office supplies	1,00	1,00	1,67	1,86	1,00	1,67	1,64	1,71	1,78	1,84	1,91	1,98	19,05
9	Official transport allowance	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	6,00
10	Electricity	11,20	12,54	14,05	14,00	16,10	16,10	16,10	16,10	16,10	10,87	16,10	10,87	170,16
11	Fuel	2,54	2,84	3,19	3,14	3,61	3,61	3,61	3,61	3,61	2,84	3,61	2,84	39,06
12	Tooling	2,64	2,96	3,31	3,27	3,76	3,76	3,76	3,76	3,76	3,84	3,76	3,84	42,39
13	Maintenance	2,30	2,58	2,89	2,84	3,26	3,26	3,26	3,26	3,26	4,84	3,26	4,84	39,87
14	Spare parts	9,34	10,46	11,72	11,67	13,42	13,42	13,42	13,42	13,42	5,84	13,42	5,84	135,39
15	Utility	0,67	0,75	0,84	0,79	0,91	0,91	0,91	0,91	0,91	6,84	0,91	6,84	22,22
16	Produetion support	1,48	1,66	1,86	1,81	2,08	2,08	2,08	2,08	2,08	7,84	2,08	7,84	34,98
17	Lab Support	0,50	0,50	0,56	0,51	0,59	0,59	0,59	0,59	0,59	8,84	0,59	8,84	23,30
18	Depreciation	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	459,00
19	Safety	1,00	1,12	2,00	2,20	3,68	3,00	3,50	3,68	3,86	3,78	3,68	3,87	35,37
	TOTAL FOH	**93,74**	**95,69**	**103,15**	**103,13**	**109,49**	**109,45**	**109,95**	**110,20**	**133,93**	**118,44**	**110,37**	**118,67**	**1.316,21**
	PRODUCTION COST	**2.429,06**	**2.586,21**	**2.944,72**	**3.282,17**	**3.626,06**	**3.625,99**	**3.626,52**	**3.626,77**	**3.732,37**	**3.635,01**	**3.626,91**	**3.635,24**	**40.377,02**

The Summary of NPV, IRR payback period
Sensitivity Analysis Normal scenario
(In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,412.67	1,187.22	(3,176.33)
2012	1,362.68	1,039.43	(1,813.65)
2013	1,306.57	893.44	(507.08)
2014	1,243.93	750.64	736.85
2015	1,174.31	612.60	1,911.16
2016	1,097.26	481.10	3,008.42
2017	1,012.29	358.14	4,020.71
2018	918.87	245.92	4,939.59
2019	816.46	146.94	5,756.05
2020	704.48	63.94	6,460.53
NPV	**1,190.38**		
IRR	**24%**		
Payback Period	**3.59**		
Profitability Index	**2.41**		

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Normal Scenario)
CASH FLOW PROJECTION

Appendix 13b

(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		42.218,69	43.485,25	44.789,81	46.133,50	47.517,50	48.943,03	50.411,32	51.923,66	53.481,37	55.085,81
Total		**42.218,69**	**43.485,25**	**44.789,81**	**46.133,50**	**47.517,50**	**48.943,03**	**50.411,32**	**51.923,66**	**53.481,37**	**55.085,81**
Operating Expense											
Raw Material		(36.187,45)	(37.273,07)	(38.391,26)	(39.543,00)	(40.729,29)	(41.951,17)	(43.209,70)	(44.505,99)	(45.841,17)	(47.216,41)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382,03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194,88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		(40.806,02)	**(42.122,57)**	**(43.483,24)**	(44.889,57)	(46.343,19)	(47.845,76)	**(49.399,03)**	(51.004,79)	**(52.664,91)**	**(54.381,33)**
Cash flow from operational activities		**1.412,67**	**1.362,68**	**1.306,57**	**1.243,93**	**1.174,31**	**1.097,26**	**1.012,29**	**918,87**	**816,46**	**704,48**
Investment											
Capital Expenditure	**(4.589,00)**										
Cash flow from investment	**(4.589,00)**										
Net Cash Flow	**(4.589,00)**	**1.412,67**	**1.362,68**	**1.306,57**	**1.243,93**	**1.174,31**	**1.097,26**	**1.012,29**	**918,87**	**816,46**	**704,48**

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Normal Scenario)

PROFIT (LOSS) PROJECTION

(in million Rupiah)

Appendix 13c

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	**Sales**	**42.218,69**	43.485,25	44.789,81	46.133,50	**47.517,50**	**48.943,03**	**50.411,32**	51.923,66	53.481,37	**55.085,81**	**483.989,93**
2	**Production Cost**	**(39.335,12)**	(40.578,13)	(41.861,57)	(43.186,82)	**(44.555,31)**	**(45.968,49)**	(47.427,89)	**(48.935,09)**	(50.491,72)	**(52.099,48)**	**(454.439,61)**
3	**Gross profit (Loss)**	**2.883,57**	2.907,12	2.928,23	2.946,67	2.962,20	2.974,54	**2.983,43**	**2.988,57**	2.989,65	**2.986,33**	**29.550,32**
4	**Operating Expense**											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	**(1.023,28)**	**(1.083,38)**	**(1.147,03)**	**(1.214,43)**	(1.285,80)	**(1.361,38)**	**(1.441,41)**	**(1.526,17)**	**(1.615,92)**	**(1.710,97)**	**(13.409,76)**
5	**Profit (Loss) from Operational**	**1.860,29**	**1.823,74**	**1.781,20**	**1.732,25**	1.676,40	1.613,17	**1.542,02**	1.462,41	1.373,73	**1.275,36**	**16.140,57**

MANUFACTURING NEW PRODUCT (Real Option Normal Scenario)
PRODUCTION COST 10 YEARS

Appendix 13d

No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	**40.208,27**	**41.414,52**	**42.656,96**	**43.936,67**	**45.254,77**	**46.612,41**	**48.010,78**	**49.451,10**	**50.934,64**	**52.462,68**	**460.942,79**
1	**MATERIAL COST 90%**	**36.187,45**	**37.273,07**	**38.391,26**	**39.543,00**	**40.729,29**	**41.951,17**	**43.209,70**	**44.505,99**	**45.841,17**	**47.216,41**	**414.848,51**
1	Salary	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	**20.958,78**
5	T H R	146,30	153,62	161,30	169,36	177,83	186,72	196,06	205,86	216,15	226,96	**1.840,15**
6	Shift Allowance	18,84	19,78	20,77	21,81	22,90	24,05	25,25	26,51	27,84	29,23	**236,97**
	TOTAL DLC	**1.831,46**	**1.923,03**	**2.019,18**	**2.120,14**	**2.226,15**	**2.337,46**	**2.454,33**	**2.577,05**	**2.705,90**	**2.841,19**	**23.035,89**
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	**2.768,14**
3	Transport Allowanee	15,60	16,38	17,20	18,06	18,96	19,91	20,91	21,95	23,05	24,20	**196,22**
4	Meal Allowance	20,40	21,42	22,49	23,62	24,80	26,04	27,34	28,70	30,14	31,65	**256,59**
5	T H R	23,52	24,70	25,93	27,23	28,59	30,02	31,52	33,10	34,75	36,49	**295,83**
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	**3,02**
7	Hand phone facility	9,60	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	**120,75**
8	Office supplies	19,05	20,00	21,00	22,05	23,16	24,31	25,53	26,81	28,15	29,55	**239,62**
9	Official transport allowance	6,00	6,30	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	**75,47**
10	Electricity	170,16	178,67	187,60	196,98	206,83	217,17	228,03	239,43	251,40	263,97	**2.140,23**
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	**491,26**
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,10	56,80	59,64	62,62	65,75	**533,13**
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,10	58,91	61,85	**501,47**
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,80	181,44	190,51	200,03	210,03	**1.702,92**
15	Utility	22,22	23,33	24,49	25,72	27,00	28,35	29,77	31,26	32,82	34,46	**279,43**
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	**439,93**
17	Lab Support	23,30	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	**293,06**
18	Depreeiation	459,00	481,95	506,05	531,35	557,92	585,81	615,10	645,86	678,15	712,06	**5.773,25**
19	Safety	35,37	37,14	39,00	40,95	42,99	45,14	47,40	49,77	52,26	54,87	**444,88**
	PRODUCTION COST	**39.335,12**	**40.578,13**	**41.861,57**	**43.186,82**	**44.555,31**	**45.968,49**	**47.427,89**	**48.935,09**	**50.491,72**	**52.099,48**	**454.439,61**

MANUFACTURING NEW PRODUCT (Real Option Normal Scenario)
PRODUCTION COST 2011

No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
	OUTPUT	**2.250,00**	**2.625,00**	**3.000,00**	**3.375,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**41.250,00**
I	**MATERIAL COST 90%**	**2.025,00**	**2.362,50**	**2.700,00**	**3.037,50**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**37.125,00**
1	Salary	140,00	126,45	140,00	139,97	140,00	139,97	140,00	140,00	139,97	140,00	139,97	140,00	1.666,32
6	Shift Allowance	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	18,84
	TOTAL DLC	**141,57**	**128,02**	**141,57**	**141,54**	**141,57**	**141,54**	**141,57**	**141,57**	**223,44**	**141,57**	**141,54**	**141,57**	**1.767,06**
1	Salary	18,50	16,71	18,50	18,47	18,50	18,47	18,50	18,50	18,47	18,50	18,47	18,50	220,08
2	Overtime cost													
3	Transport Allowance	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	15,60
4	Meal Allowance	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	20,40
6	Shift Allowance	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,24
7	Hand phone facility	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	9,60
8	Office supplies	1,00	1,00	1,67	1,86	1,00	1,67	1,64	1,71	1,78	1,84	1,91	1,98	19,05
9	Official transport allowance	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	6,00
10	Electricity	11,20	12,54	14,05	14,00	16,10	16,10	16,10	16,10	16,10	10,87	16,10	10,87	170,16
11	Fuel	2,54	2,84	3,19	3,14	3,61	3,61	3,61	3,61	3,61	2,84	3,61	2,84	39,06
12	Tooling	2,64	2,96	3,31	3,27	3,76	3,76	3,76	3,76	3,76	3,84	3,76	3,84	42,39
13	Maintenance	2,30	2,58	2,89	2,84	3,26	3,26	3,26	3,26	3,26	4,84	3,26	4,84	39,87
14	Spare parts	9,34	10,46	11,72	11,67	13,42	13,42	13,42	13,42	13,42	5,84	13,42	5,84	135,39
15	Utility	0,67	0,75	0,84	0,79	0,91	0,91	0,91	0,91	0,91	6,84	0,91	6,84	22,22
16	Production support	1,48	1,66	1,86	1,81	2,08	2,08	2,08	2,08	2,08	7,84	2,08	7,84	34,98
17	Lab Support	0,50	0,50	0,56	0,51	0,59	0,59	0,59	0,59	0,59	8,84	0,59	8,84	23,30
18	Depreciation	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	459,00
19	Safety	1,00	1,12	2,00	2,20	3,68	3,00	3,50	3,68	3,86	3,78	3,68	3,87	35,37
	TOTAL FOH	**93,74**	**95,69**	**103,15**	**103,13**	**109,49**	**109,45**	**109,95**	**110,20**	**133,93**	**118,44**	**110,37**	**118,67**	**1.316,21**
	PRODUCTION COST	**2.260,31**	**2.586,21**	**2.944,72**	**3.282,17**	**3.626,06**	**3.625,99**	**3.626,52**	**3.626,77**	**3.732,37**	**3.635,01**	**3.626,91**	**3.635,24**	**40.208,27**

The Summary of NPV, IRR payback period
Sensitivity Analysis Pessimistic scenario
(In million Rupiah)

Year	Cash Flow	PV (18.99 %)	Cumulative
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,007.67	846.85	(3,581.33)
2012	945.53	721.24	(2,635.80)
2013	876.90	599.63	(1,758.90)
2014	801.37	483.58	(957.52)
2015	718.48	374.81	(239.04)
2016	627.76	275.25	388.72
2017	528.70	187.05	917.42
2018	420.77	112.61	1,338.19
2019	303.42	54.61	1,641.61
2020	176.05	15.98	1,817.66
NPV	**(917.39)**		
IRR	**9%**		
Payback Period	**5.62**		
Profitability Index	**1.40**		

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Pessimistic Scenario)

CASH FLOW PROJECTION

(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		39.383,69	40.565,20	41.782,15	43.035,62	44.326,69	45.656,49	47.026,18	48.436,97	49.890,08	51.386,78
Total		**39.383,69**	**40.565,20**	**41.782,15**	**43.035,62**	**44.326,69**	**45.656,49**	**47.026,18**	**48.436,97**	**49.890,08**	**51.386,78**
Operating Expense											
Raw Material		(33.757,45)	(34.770,17)	(35.813,27)	(36.887,67)	(37.994,30)	(39.134,13)	(40.308,16)	(41.517,40)	(42.762,92)	(44.045,81)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382,03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194,88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		**(38.376,02)**	**(39.619,67)**	**(40.905,25)**	**(42.234,25)**	**(43.608,20)**	**(45.028,73)**	**(46.497,48)**	**(48.016,19)**	**(49.586,66)**	**(51.210,73)**
Cash flow from operational activities		**1.007,67**	**945,53**	**876,90**	**801,37**	**718,48**	**627,76**	**528,70**	**420,77**	**303,42**	**176,05**
Investment											
Capital Expenditure	(4.589,00)										
Cash flow from investment	(4.589,00)										
Net Cash Flow	(4.589,00)	1.007,67	945,53	876,90	801,37	718,48	627,76	528,70	420,77	303,42	176,05

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Pessimistic Scenario)

PROFIT (LOSS) PROJECTION

(in million Rupiah)

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	Sales	39.383,69	40.565,20	41.782,15	43.035,62	44.326,69	45.656,49	47.026,18	48.436,97	49.890,08	51.386,78	451.489,84
2	Production Cost	(36.905,12)	(38.075,23)	(39.283,58)	(40.531,50)	(41.820,32)	(43.151,45)	(44.526,34)	(45.946,49)	(47.413,47)	(48.928,88)	(426.582,38)
3	Gross profit (Loss)	2.478,57	2.489,97	2.498,57	2.504,12	2.506,37	2.505,04	2.499,84	2.490,47	2.476,61	2.457,89	24.907,45
4	Operating Expense											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	(1.023,28)	(1.083,38)	(1.147,03)	(1.214,43)	(1.285,80)	(1.361,38)	(1.441,41)	(1.526,17)	(1.615,92)	(1.710,97)	(13.409,76)
5	Profit (Loss) from Operational	1.455,29	1.406,59	1.351,54	1.289,69	1.220,57	1.143,66	1.058,43	964,31	860,69	746,93	11.497,69

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Pessimistic Scenario) **Appendix 14d**

PRODUCTION COST 10 YEARS

No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	**37.508,27**	**38.633,52**	**39.792,53**	**40.986,30**	**42.215,89**	**43.482,37**	**44.786,84**	**46.130,45**	**47.514,36**	**48.939,79**	**429.990,32**
I	**MATERIAL COST 90%**	**33.757,45**	**34.770,17**	**35.813,27**	**36.887,67**	**37.994,30**	**39.134,13**	**40.308,16**	**41.517,40**	**42.762,92**	**44.045,81**	**386.991,29**
1	Salary	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	**20.958,78**
5	T H R	146,30	153,62	161,30	169,36	177,83	186,72	196,06	205,86	216,15	226,96	**1.840,15**
6	Shift Allowance	18,84'	19,78	20,77	21,81	22,90	24,05	25,25	26,51	27,84	29,23	**236,97**
	TOTAL DLC	**1.831,46**	**1.923,03**	**2.019,18**	**2.120,14**	**2.226,15**	**2.337,46**	**2.454,33**	**2.577,05**	**2.705,90**	**2.841,19**	**23.035,89**
III	**FACTORY OVERHEAD**											
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	**2.768,14**
3	Transport Allowance	15,60	16,38	17,20	18,06	18,96	19,91	20,91	21,95	23,05	24,20	**196,22**
4	Meal Allowance	20,40	21,42	22,49	23,62	24,80	26,04	27,34	28,70	30,14	31,65	**256,59**
5	T H R	23,52	24,70	25,93	27,23	28,59	30,02	31,52	33,10	34,75	36,49	**295,83**
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	**3,02**
7	Hand phone facility	9,60	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	**120,75**
8	Office supplies	19,05	20,00	21,00	22,05	23,16	24,31	25,53	26,81	28,15	29,55	**239,62**
9	Official transport	6,00	6,30	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	**75,47**
10	Electricity	170,16	178,67	187,60	196,98	206,83	217,17	228,03	239,43	251,40	263,97	**2.140,23**
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	**491,26**
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,10	56,80	59,64	62,62	65,75	**533,13**
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,10	58,91	61,85	**501,47**
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,80	181,44	190,51	200,03	210,03	**1.702,92**
15	Utility	22,22	23,33	24,49	25,72	27,00	28,35	29,77	31,26	32,82	34,46	**279,43**
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	**439,93**
17	Lab Support	23,30	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	**293,06**
18	Depreciation	459,00	481,95	506,05	531,35	557,92	585,81	615,10	645,86	678,15	712,06	**5.773,25**
19	Safety	35,37	37,14	39,00	40,95	42,99	45,14	47,40	49,77	52,26	54,87	**444,88**
	TOTAL FOH	**1.316,21**	**1.382,03**	**1.451,13**	**1.523,68**	**1.599,87**	**1.679,86**	**1.763,85**	**1.852,05**	**1.944,65**	**2.041,88**	**16.555,21**
	PRODUCTION COST	**36.905,12**	**38.075,23**	**39.283,58**	**40.531,50**	**41.820,32**	**43.151,45**	**44.526,34**	**45.946,49**	**47.413,47**	**48.928,88**	**426.582,38**

MANUFACTURING NEW PRODUCT (Sensitivity Analysis Pessimistic Scenario) **Appendix 14e**

PRODUCTION COST 2011

No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
	OUTPUT	**1.500,00**	**1.875,00**	**2.250,00**	**2.625,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**38.250,00**
I	**MATERIAL COST 90%**	**1.350,00**	**1.687,50**	**2.025,00**	**2.362,50**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**34.425,00**
II	**DIRECT LABOUR**													
1	Salary	140,00	126,45	140,00	139,97	140,00	139,97	140,00	140,00	139,97	140,00	139,97	140,00	1.666,32
6	Shift Allowance	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	18,84
	TOTAL DLC	**141,57**	**128,02**	**141,57**	**141,54**	**141,57**	**141,54**	**141,57**	**141,57**	**223,44**	**141,57**	**141,54**	**141,57**	**1.767,06**
III	**FACTORY OVERHEAD**													
1	Salary	18,50	16,71	18,50	18,47	18,50	18,47	18,50	18,50	18,47	18,50	18,47	18,50	220,08
2	Transport Allowance	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	15,60
3	Meal Allowance	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	20,40
4	Shift Allowance	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,24
5	Hand phone facility	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	9,60
6	Offiee supplies	1,00	1,00	1,67	1,86	1,00	1,67	1,64	1,71	1,78	1,84	1,91	1,98	19,05
7	Official transport allowance	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	6,00
8	Electricity	11,20	12,54	14,05	14,00	16,10	16,10	16,10	16,10	16,10	10,87	16,10	10,87	170,16
9	Fuel	2,54	2,84	3,19	3,14	3,61	3,61	3,61	3,61	3,61	2,84	3,61	2,84	39,06
10	Tooling	2,64	2,96	3,31	3,27	3,76	3,76	3,76	3,76	3,76	3,84	3,76	3,84	42,39
11	Maintenance	2,30	2,58	2,89	2,84	3,26	3,26	3,26	3,26	3,26	4,84	3,26	4,84	39,87
12	Spare parts	9,34	10,46	11,72	11,67	13,42	13,42	13,42	13,42	13,42	5,84	13,42	5,84	135,39
13	Utility	0,67	0,75	0,84	0,79	0,91	0,91	0,91	0,91	0,91	6,84	0,91	6,84	22,22
14	Produetion support	1,48	1,66	1,86	1,81	2,08	2,08	2,08	2,08	2,08	7,84	2,08	7,84	34,98
15	Lab Support	0,50	0,50	0,56	0,51	0,59	0,59	0,59	0,59	0,59	8,84	0,59	8,84	23,30
16	Depreciation	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	459,00
17	Safety	1,00	1,12	2,00	2,20	3,68	3,00	3,50	3,68	3,86	3,78	3,68	3,87	35,37
	TOTAL FOH	**93,74**	**95,69**	**103,15**	**103,13**	**109,49**	**109,45**	**109,95**	**110,20**	**133,93**	**118,44**	**110,37**	**118,67**	**1.316,21**
	PRODUCTION COST	**1.585,31**	**1.911,21**	**2.269,72**	**2.607,17**	**3.626,06**	**3.625,99**	**3.626,52**	**3.626,77**	**3.732,37**	**3.635,01**	**3.626,91**	**3.635,24**	**37.508,27**

The Summary of NPV, IRR payback period
Real Option Optimistic scenario with the capacity 100% on April 2010
(In million Rupiah)

The Summary of NPV, IRR dan payback period (In million Rupiah)			
Year	**Cash Flow**	**PV (18.99 %)**	**Cumulative**
2010	(4,589.00)	(4,589.00)	(4,589.00)
2011	1,625.18	1,365.81	(2,963.82)
2012	1,831.31	1,396.90	(1,132.51)
2013	2,056.50	1,406.25	923.99
2014	2,302.29	1,389.30	3,226.28
2015	2,570.38	1,340.88	5,796.66
2016	2,862.59	1,255.12	8,659.24
2017	3,180.86	1,125.35	11,840.10
2018	3,527.31	944.03	15,367.41
2019	3,904.19	702.64	19,271.60
2020	4,313.96	391.57	23,585.56
NPV	**6,728.84**		
IRR	**45%**		
Payback Period	**2.45**		
Profitability Index	**6.14**		

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario full Capacity on April 2011)

Appendix 15b

CASH FLOW PROJECTION

(in million Rupiah)

DESCRIPTION		1	2	3	4	5	6	7	8	9	10
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenue											
Revenue from Sales		43.706,25	46.765,69	50.039,29	53.542,04	57.289,98	61.300,28	65.591,30	70.182,69	75.095,47	80.352,16
Total		**43.706,25**	**46.765,69**	**50.039,29**	**53.542,04**	**57.289,98**	**61.300,28**	**65.591,30**	**70.182,69**	**75.095,47**	**80.352,16**
Operating Expense											
Raw Material		(37.462,50)	(40.084,88)	(42.890,82)	(45.893,17)	(49.105,70)	(52.543,09)	(56.221,11)	(60.156,59)	(64.367,55)	(68.873,28)
Direct Labor Cost (DLC)		(1.831,46)	(1.923,03)	(2.019,18)	(2.120,14)	(2.226,15)	(2.337,46)	(2.454,33)	(2.577,05)	(2.705,90)	(2.841,19)
Factory Over Head (FOH)		(1.316,21)	(1.382.03)	(1.451,13)	(1.523,68)	(1.599,87)	(1.679,86)	(1.763,85)	(1.852,05)	(1.944,65)	(2.041,88)
General & Administration Cost		(1.285,30)	(1.349,57)	(1.417,04)	(1.487,90)	(1.562,29)	(1.640,40)	(1.722,42)	(1.808,55)	(1.898,97)	(1.993,92)
Logistic		(185,60)	(194.88)	(204,62)	(214,85)	(225,59)	(236,87)	(248,72)	(261,15)	(274,21)	(287,92)
Total		**(42.081,07)**	**(44.934,37)**	**(47.982,79)**	**(51.239,75)**	**(54.719,60)**	**(58.437,69)**	**(62.410,44)**	**(66.655,38)**	**(71.191,28)**	**(76.038,20)**
Cash flow from operational activities		**1.625,18**	**1.831,31**	**2.056,50**	**2.302,29**	**2.570,38**	**2.862,59**	**3.180,86**	**3.527,31**	**3.904,19**	**4.313,96**
Investment											
Capital Expenditure	**(4.589,00)**										
Cash flow from investment	**(4.589,00)**										
Net Cash Flow	**(4.589,00)**	**1.625,18**	**1.831,31**	**2.056,50**	**2.302,29**	**2.570,38**	**2.862,59**	**3.180,86**	**3.527,31**	**3.904,19**	**4.313,96**

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario full Capacity on April 2011)

Appendix 15c

PROFIT (LOSS) PROJECTION

(in million Rupiah)

No	DESCRIPTION	YEAR										TOTAL
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
1	**Sales**	**43.706,25**	**46.765,69**	**50.039,29**	**53.542,04**	**57.289,98**	**61.300,28**	**65.591,30**	70.182,69	75.095,47	**80.352,16**	**603.865,13**
2	**Production Cost**	**(40.610,17)**	**(43.389,93)**	**(46.361,13)**	(49.537,00)	(52.931,71)	**(56.560,41)**	**(60.439,29)**	**(64.585,68)**	(69.018,10)	**(73.756,35)**	**(557.189,78)**
3	**Gross profit (Loss)**	**3.096,08**	**3.375,76**	3.678,16	4.005,04	4.358,27	4.739,86	**5.152,00**	**5.597,01**	6.077,38	6.595,81	46.675,35
4	**Operating Expense**											
	- General & Administration Cost	(894,16)	(947,81)	(1.004,68)	(1.064,96)	(1.128,86)	(1.196,59)	(1.268,38)	(1.344,49)	(1.425,16)	(1.510,66)	(11.785,74)
	- Logistic	(129,12)	(135,57)	(142,35)	(149,47)	(156,94)	(164,79)	(173,03)	(181,68)	(190,76)	(200,30)	(1.624,02)
	Total Operating Expense	**(1.023,28)**	**(1.083,38)**	**(1.147,03)**	**(1.214,43)**	**(1.285,80)**	**(1.361,38)**	**(1.441,41)**	**(1.526,17)**	**(1.615,92)**	**(1.710,97)**	**(13.409,76)**
5	**Profit (Loss) from Operational**	**2.072,80**	**2.292,37**	2.531,13	**2.790,61**	**3.072,47**	3.378,49	**3.710,59**	**4.070,84**	4.461,46	**4.884,84**	**33.265,59**

Appendix 15d

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario full Capacity on April 2011)
Million Rupiah

No	DESCRIPTION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Rp
	OUTPUT	**41.625,00**	**44.538,75**	**47.656,46**	**50.992,41**	**54.561,88**	**58.381,22**	**62.467,90**	**66.840,65**	**71.519,50**	**76.525,86**	**575.109,65**
I	**MATERIAL COST 90%**	**37.462,50**	**40.084,88**	**42.890,82**	**45.893,17**	**49.105,70**	**52.543,09**	**56.221,11**	**60.156,59**	**64.367,55**	**68.873,28**	**517.598,68**
II	**DIRECT LABOUR**											
1	Salary	1.666,32	1.749,63	1.837,12	1.928,97	2.025,42	2.126,69	2.233,03	2.344,68	2.461,91	2.585,01	**20.958,78**
5	THR	146,30	153,62	161,30	169,36	177,83	186,72	196,06	205,86	216,15	226,96	**1.840,15**
6	Shift Allowance	18,84	19,78	20,77	21,81	22,90	24,05	25,25	26,51	27,84	29,23	**236,97**
	TOTAL DLC	**1.831,46**	**1.923,03**	**2.019,18**	**2.120,14**	**2.226,15**	**2.337,46**	**2.454,33**	**2.577,05**	**2.705,90**	**2.841,19**	**23.035,89**
1	Salary	220,08	231,08	242,64	254,77	267,51	280,88	294,93	309,67	325,16	341,42	**2.768,14**
3	Transport Allowance	15,60	16,38	17,20	18,06	18,96	19,91	20,91	21,95	23,05	24,20	**196,22**
4	Meal Allowance	20,40	21,42	22,49	23,62	24,80	26,04	27,34	28,70	30,14	31,65	**256,59**
5	THR	23,52	24,70	25,93	27,23	28,59	30,02	31,52	33,10	34,75	36,49	**295,83**
6	Shift Allowance	0,24	0,25	0,26	0,28	0,29	0,31	0,32	0,34	0,35	0,37	**3,02**
7	Hand phone facility	9,60	10,08	10,58	11,11	11,67	12,25	12,86	13,51	14,18	14,89	**120,75**
8	Office supplies	19,05	20,00	21,00	22,05	23,16	24,31	25,53	26,81	28,15	29,55	**239,62**
9	Official transport allowance	6,00	6,30	6,62	6,95	7,29	7,66	8,04	8,44	8,86	9,31	**75,47**
10	Electricity	170,16	178,67	187,60	196,98	206,83	217,17	228,03	239,43	251,40	263,97	**2.140,23**
11	Fuel	39,06	41,01	43,06	45,21	47,47	49,85	52,34	54,96	57,71	60,59	**491,26**
12	Tooling	42,39	44,51	46,73	49,07	51,52	54,10	56,80	59,64	62,62	65,75	**533,13**
13	Maintenance	39,87	41,86	43,96	46,15	48,46	50,88	53,43	56,10	58,91	61,85	**501,47**
14	Spare parts	135,39	142,16	149,27	156,73	164,57	172,80	181,44	190,51	200,03	210,03	**1.702,92**
15	Utility	22,22	23,33	24,49	25,72	27,00	28,35	29,77	31,26	32,82	34,46	**279,43**
16	Production support	34,98	36,73	38,56	40,49	42,51	44,64	46,87	49,22	51,68	54,26	**439,93**
17	Lab Support	23,30	24,46	25,69	26,97	28,32	29,74	31,22	32,79	34,42	36,15	**293,06**
18	Depreciation	459,00	481,95	506,05	531,35	557,92	585,81	615,10	645,86	678,15	712,06	**5.773,25**
19	Safety	35,37	37,14	39,00	40,95	42,99	45,14	47,40	49,77	52,26	54,87	**444,88**
	TOTAL FOH	**1.316,21**	**1.382,03**	**1.451,13**	**1.523,68**	**1.599,87**	**1.679,86**	**1.763,85**	**1.852,05**	**1.944,65**	**2.041,88**	**16.555,21**
	PRODUCTION COST	**40.610,17**	**43.389,93**	**46.361,13**	**49.537,00**	**52.931,71**	**56.560,41**	**60.439,29**	**64.585,68**	**69.018,10**	**73.756,35**	**557.189,78**

MANUFACTURING NEW PRODUCT (Real Option Optimistic Scenario full Capacity on April 2011)
PRODUCTION COST 2011 (Million Rupiah)

No	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
	OUTPUT	**2.250,00**	**2.625,00**	**3.000,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**3.750,00**	**41.625,00**
I	**MATERIAL COST 90%**	**2.025,00**	**2.362,50**	**2.700,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**3.375,00**	**37.462,50**
II	**DIRECT LABOUR**													
1	Salary	140,00	126,45	140,00	139,97	140,00	139,97	140,00	140,00	139,97	140,00	139,97	140,00	1.666,32
2	Shift Allowance	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	1,57	18,84
	TOTAL DLC	**141,57**	**128,02**	**141,57**	**141,54**	**141,57**	**141,54**	**141,57**	**141,57**	**223,44**	**141,57**	**141,54**	**141,57**	**1.767,06**
III	**FACTORY OVERHEAD**													
1	Salary	18,50	16,71	18,50	18,47	18,50	18,47	18,50	18,50	18,47	18,50	18,47	18,50	220,08
3	Transport Allowance	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	15,60
4	Meal Allowance	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	1,70	20,40
6	Shift Allowance	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,24
7	Hand phone facility	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	0,80	9,60
8	Office supplies	1,00	1,00	1,67	1,86	1,00	1,67	1,64	1,71	1,78	1,84	1,91	1,98	19,05
9	Official transport allowance	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	6,00
10	Electricity	11,20	12,54	14,05	14,00	16,10	16,10	16,10	16,10	16,10	10,87	16,10	10,87	170,16
11	Fuel	2,54	2,84	3,19	3,14	3,61	3,61	3,61	3,61	3,61	2,84	3,61	2,84	39,06
12	Tooling	2,64	2,96	3,31	3,27	3,76	3,76	3,76	3,76	3,76	3,84	3,76	3,84	42,39
13	Maintenance	2,30	2,58	2,89	2,84	3,26	3,26	3,26	3,26	3,26	4,84	3,26	4,84	39,87
14	Spare parts	9,34	10,46	11,72	11,67	13,42	13,42	13,42	13,42	13,42	5,84	13,42	5,84	135,39
15	Utility	0,67	0,75	0,84	0,79	0,91	0,91	0,91	0,91	0,91	6,84	0,91	6,84	22,22
16	Production support	1,48	1,66	1,86	1,81	2,08	2,08	2,08	2,08	2,08	7,84	2,08	7,84	34,98
17	Lab Support	0,50	0,50	0,56	0,51	0,59	0,59	0,59	0,59	0,59	8,84	0,59	8,84	23,30
18	Depreciation	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	38,25	459,00
19	Safety	1,00	1,12	2,00	2,20	3,68	3,00	3,50	3,68	3,86	3,78	3,68	3,87	35,37
	TOTAL FOH	**93,74**	**95,69**	**103,15**	**103,13**	**109,49**	**109,45**	**109,95**	**110,20**	**133,93**	**118,44**	**110,37**	**118,67**	**1.316,21**
	PRODUCTION COST	**2.260,31**	**2.586,21**	**2.944,72**	**3.619,67**	**3.626,06**	**3.625,99**	**3.626,52**	**3.626,77**	**3.732,37**	**3.635,01**	**3.626,91**	**3.635,24**	**40.545,77**