A critical evaluation of investment in an upstream business to supply the current production: a case study of metal shutter door productions.

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A Thesis Submitted in Partial Fulfillment of the Requirements
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การศึกษาความคุ้มค่าในการลงทุนของขยายกิจการเข้าสู่อุตสาหกรรมต้นน้ำ กรณีศึกษา: กิจการการผลิตประตูม้วนเหล็ก

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิศวกรรมศาสตรมหาบัณฑิต
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ภูมิกรณ์ วิริยะรังรอง : การศึกษาความคุ้มค่าในการลงทุนของขยายกิจการเข้าสู่อุตสาหกรรมต้นน้ำ กรณีศึกษา: กิจการการผลิตประตูม้วนเหล็ก (A critical evaluation of investment in an upstream business to supply the current production: a case study of metal shutter door productions.) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ศ. ดร. ปารเมศ ชุติมา, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: ธัญนนท์ รัตนเกื้อกังวาน, หน้า.

วิทยานิพนธ์ฉบับนี้ถูกจัดทำเพื่อใช้ในการประกอบการตัดสินใจการลงทุนของบริษัทในทิศทางใดทิศทางหนึ่ง โดยทั่วไปสำหรับธุรกิจแล้วการลงทุนหมายถึงการเจริญเติบโต โดยเฉพาะอย่างยิ่งสำหรับธุรกิจที่มีความเฉพาะเจาะจงเป็นพิเศษ โดยเฉพาะธุรกิจประเภทค้าส่ง หรือ สินค้าเป็นประเภทการขายแบบธุรกิจ สู่ ธุรกิจ (ไม่ใช่ธุรกิจที่ขายสินค้าสู่ผู้บริโภคโดยตรง) และยังเป็นธุรกิจครอบครัวซึ่งไม่บ่อยนักที่จะมีการทำการศึกษา ธุรกิจประเภทดังกล่าว

สำหรับวิธีการ ทฤษฎี หรือเครื่องมือต่างๆที่ใช้ในการทำการศึกษานั้น โดยส่วนใหญ่แล้วจะถูกนำมาใช้โดยยึดหลักการของความจำเป็นในการทำธุรกิจเป็นหลัก ซึ่งแสดงถึงความสามารถทางการเงิน โดยทฤษฎีแรกที่ใช้ได้แก่ ทฤษฎีมุมมองพื้นฐานบนทรัพยากร(Resources based view analysis)โดยทฤษฎีดังกล่าว จะใช้หลักการคิดที่เรียกว่า VRIO analysis ทฤษฎีที่สองได้แก่ ทฤษฎีกลยุทธ์การดำเนินงานและปฏิบัติงาน(Operation strategy) โดยใช้กรอบความคิดที่เรียกว่า Hill's Framework เพื่อที่จะใช้ในการประกอบการพิจารณากลยุทธ์ขององค์กร ทิศทางขององค์กร และเป้าหมายขององค์กร ในขณะเดียวกัน มิติที่สองในการพิจารณาการศึกษาดังกล่าวก็คือ ความสามารถทางการเงินของกิจการ โดยทางผู้จัดทำได้เสนอการใช้ อัตราส่วนทางการเงินได้แก่ มูลค่าปัจจุบันสุทธิ(NPV)ซึ่งแสดงถึงมูลค่าของทางเลือกดังกล่าวในรูปแบบของการเงิน อัตราผลตอบแทนภายใน(IRR) แสดงถึงขีดความสามารถการตอบแทนการลงทุน และ ผลตอบแทนจากการลงทุน(ROI) แสดงถึงความคุ้มค่าในการลงทุนในช่วงระยะเวลาจำกัดเทียบกับมูลค่าลงทุนตั้งต้น

หลังจกการศึกษาพบว่า รูปแบบของธุรกิจที่เหมาะกับการลงทุนขยายกิจการของบริษัท วิริยะโลหะกิจ จำกัด มากที่สุดคือ รูปแบบ2.3 หรือ รูปแบบการร่วมทุนกับคู่ข้าที่เป็นธุกิจประเภทชิ้นส่วนรถยนต์โดยตัดสินจากสองปัจจัยหลักได้แก่ จากการศึกษาสภาพแวดล้อมค้นพบว่าสถานการณ์ปัจจุบันมีแนวโน้มที่จะเป็นเหตุการณ์กรณีวิกฤต มากกว่าเหตุการณ์กรณีปกติ อีกทั้ง รูปแบบการลงทุนดังกล่าว ยังตอบโจทย์ในเรื่องของทฤษฎีมุมมองพื้นฐานบนทรัพยากร อีกด้วย

ภาควิชา	ศูนย์ระดับภูมิภาคทางวิศวกรรมระบบการผลิต	ลายมือชื่อนิสิต	.....
		ลายมือชื่อ อ.ที่ปรึกษาหลัก	.....
สาขาวิชา	การจัดการทางวิศวกรรม	ลายมือชื่อ อ.ที่ปรึกษาร่วม	.....
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PHUMIKRON VIRIYARUNGRONG: A critical evaluation of investment in an upstream business to supply the current production: a case study of metal shutter door productions.. ADVISOR: PROF. PARAMES CHUTIMA, CO-ADVISOR: DHUNYANON RATANAKUAKANGWAN, pp.

This research was created on the purpose of guiding the company's direction on investment to make or do nothing is a very important. In business, the investment meaning to growth of the company especially in special business sector as Viriyalohakij, which is Business to Business product with a family owned research is not conducted often.

The method and tools that used in this study are mostly come from business point of view. That reflects on the investment cash flow and many financial components which are resources based view analysis by using VRIO tool for the process. Operation strategy will use Hill's framework for scoping the company direction objectives and goals. While financial part will use ratio on analysis which are NPV represents for total alternative valued based on a certain period of time. IRR the international return rate that the alternative reflect in percentage, ROI represents for the percentage of return in this investment and ROI which represents for the amount of time spending before the cash flow make profit.

The author decides to suggest the company to choose alternative 2.3 investment model, which is establishing a new business on the joint venture model of investment. Based on the environment (PESTLE analysis), the current situation is highly possibly to be worst case than normal case. Alternative 2.3 still in top 3 of VRIO analysis and also make the best financial outcome in financial analysis.

Department:	Regional Centre for Manufacturing Systems Engineering	Student's Signature .....
		Advisor's Signature .....
		Co-Advisor's Signature .....
Field of Study:	Engineering Management	
Academic Year:	2016	

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I, myself, would like to thanks for the company that funding and support me through the end of study and complete the research. I wish this research will be advantages for the company as much as possible.

CONTENTS

Page

Page

Page

Page

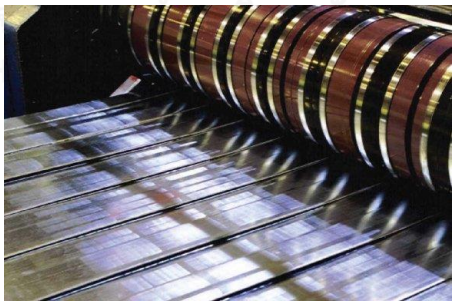
List of Figures

List of Tables

Chapter 1
Introduction

In the steel market, especially in Thailand, the big players always take the advantage even control the policy of the government themselves for competition advantages. However in order to survive in the tough market industry, as steel, in Thailand to step ahead, R&D and expanding business process is a must. I as the successor of the family business, which will have to continue itself through my generation, it's time to expand the company potential back through the supply chain stream line. However, to invest in the right amount of money and action, the research must be taken to gather information and guide the company to make the right decision.

This research was focusing on the size transforming process of steel sheet, normally in Thailand to change the size from the standard in the market the process called " slit" will be used when the number comes to amount of industrial size(which if you use a small number of various size slitting process is not concerned). Compare with the other size of product, shutter door use a various size of steel plate and that's why slitting process should be concerned when to expand the business. The figure blow shows the focus process that will be analyzed in the research.



In Thailand, cold roll industry was revealed as the supply for the electronic manufacturer in Thailand as the main purpose. The standard size in Thailand, included shutter door business, are 914, 100, 1214, 128, 215 mm which all are difficult and costly to be prepared from the manufacturer. Also, the flexibility when the company has the ability to do the process itself is time and amount of coils.

Company Background

In Thailand's cold role business market, there's no big player compare with other steel business in Thailand which is mostly monopoly controlled. So that based on the government policy this reach to the absolute competitive market that everyone can get in to the business easily. However what comes out with the result is the various type of application in cold roll material which leads to every direction of steel used such as furniture, electronic product and construction material.

Viriyalohakij co., ltd. had been established for 18 years (officially registered on 1995). The main product of Viriyalohakij company is steel rolling shutter door. The first factory was established in 1995 and the second factory which is now the main factory of company has started from 2005. Main core competence of the company is manufacturing by made to order purpose. With this core competence, the company become able to stand against modern trade that invade to all over area in Thailand.

After the second factory was established, This Company is starting to expand the branch from 1 branch to become 12 branches in 8 years. After year 2008, the company has been started the new line production of metal forming sheet for roofing.

The company supply chain was modeled as the process as (figure 1). In this thesis, the study will focus on only one product line which is shutter door product.

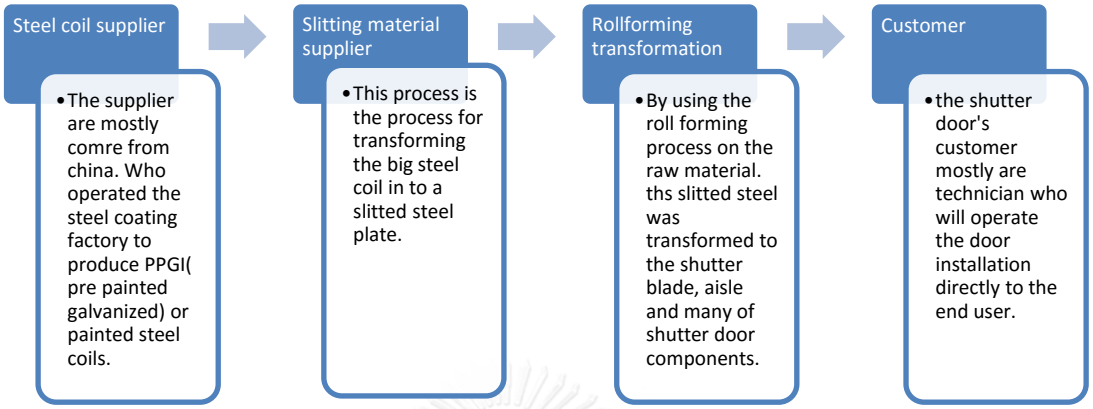


Figure 1 Viriyalohakij's supply steam

The current market of shutter door business has been changed by the changing behavior of customer. The customer currently changes in number of technician to the end user. The current company potential has now expanding from the manufacturer to be trader and

After several modules had been taken, the author would select 4 main core topics of each module to cooperate in this research. Supply Chain management module (SCM) provide the tools to analyze and understanding the flow of supply chain, in this research consider the 4 basic flows and strategic outsourcing Bharat Vagadia (2012), total cost of ownership and total cost of acquisition. According to the module will be analyzed to understand the chain capability of company and supplier which leads to the competitive advantages by focus on cost analysis in supply chain. While the module of BSSM), and IJV will represents two core tools, BSSM will show the analysis of resource based view capability Rothermal (2012), to use in this decision making, in contrast IJV will represent the possibility type of cooperation capability on this contract to start. Lastly, Operation system management module will be used to

make sure that weather or not the decision was made to achieve the company goals by using modified hill framework (1995).

Problem statement

1. Managing Director is already intend to expand the business

The company had been planning to expand by getting more resources access back to the supply chain stream to gain more bargaining power and doing cost competitive. This is not only affecting to the shutter door product of company but also each product required unique for production in roll forming business. However, each steel plate to do the roll forming production will needed to be slitting before get in to the machine. So the MD intends to control this process in order to reduce the time of process and waste control.

2. Cost of product growth.

The first reason coming from company's growth planning. According to the owner of company, who is the current Managind Director for more than 18 years, He's now planning to expand the company in to many direction in these recently years. The first is to real estate which come up with the warehouse/factory area for lease, imports the raw material by company management. And this research was based on the expanding plan on the way back to the process on upstream of the supply chain. Based on the growing in sales of products and demand of construction growth in Thailand (National statistic organization 2014), the company has been considering the factor of growing in vertical supply chain as well. The amount of spending in the company on raw material transformation has been increased along with growing in demand during recently years. However, the decision is still unclear to be decided, progress the right direction on vertical integration of supply chain.

According to the collected data from 2010 to 2014 (Table 1), the percentage of slitting cost of company has been increased per unit as followed;

Table 1 Slitting cost of product in percentage

year	Cost (%)
2010	2.97479
2011	2.846624
2012	2.631787
2013	3.157014
2014	3.235556

The reason why the percentage of cost increasing every year are mostly come from 3 factors, first is the factor that when the company import more cost of coil damaged (since the cost of slit operation per unit is a variable cost directly to the import volume) the second factor is the price of raw material. Since 2011 the company reduces the amount of using the material from Thai supplier and rely more on import price which is a lot cheaper than before. The last factor is trend of steel price; according to data collected the steel price went down almost every year. Because of those factors, the cost comes out with increasing in total percentage every year.

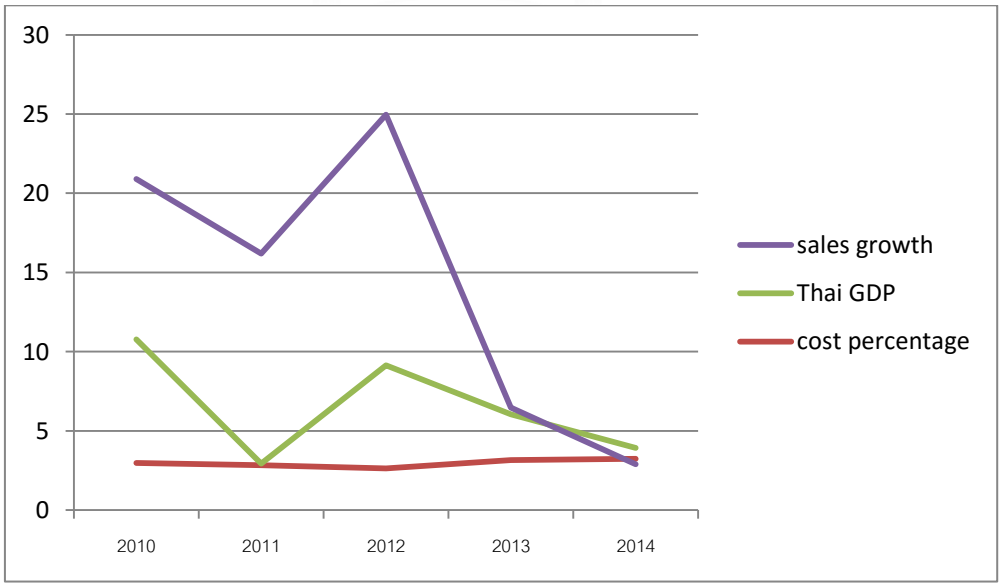


Figure 2 Sales Growth vs Thailand GDP vs Cost of slitting process (%)

The figure shows the relation among 3 factors in percentage. The sales growth percentage was more fluctuate than any of line of trend. Considering Thai GDP along with sales growth has almost the same trend in increasing and decreasing phase. However, the sales growth percentage represents a lot more variation. Also, the cost percentage which mentioned in previous table also represents the slightly growing of cost while all of GDP and sales growth is decreasing.

While considering the factor that cause the problem to create the research should be list in 4 factors as followed, first projected demand as mentioned in the previous paragraph, the increasing of market demand along with growing sales of company establish the increasing of import volume of raw material of the company.
Second factor, the service fee of material transforming has been increased along with the company expanding capacity which direct affect to the variable cost is increased. This force the company to make an action to decreased this increasing cost.
Company production capacity expanding, according to the increasing of demand in product, the company itself are under process of expanding capacity.
Investment cost of expanding business factor. Due to the economic regression on last two quarter of 2014 to first two quarter of 2015, some of the big investment plan has been postpone or stop the plan for wait and see the situation.
To solve these problem appropriately the research must be take on the decision making process on the investment alternative.

Based on the growing in sales of products and demand of construction growth in Thailand (Thailand national statistic organization 2014), the company has been considering the factor of growing in vertical supply chain as well. The amount of spending in the company on raw material transformation has been increased along with growing in demand during recently years. However, the decision is still unclear to be decided, progress the right direction on vertical integration of supply chain.
The reason why the percentage of cost increasing every year are mostly come from 3 factors;

First is the factor of transportation. The cost of transportation will have to be 2 times of transportation from the port to slitting center for service and transport from the slitting company to VIRIYALOHAKIJ which cost more than one direct transportation to company.

The second factor is the price of raw material (cold roll steel). Since 2011 the company reduces the amount of using the material from Thai supplier and rely more on import price which is a lot cheaper than before.

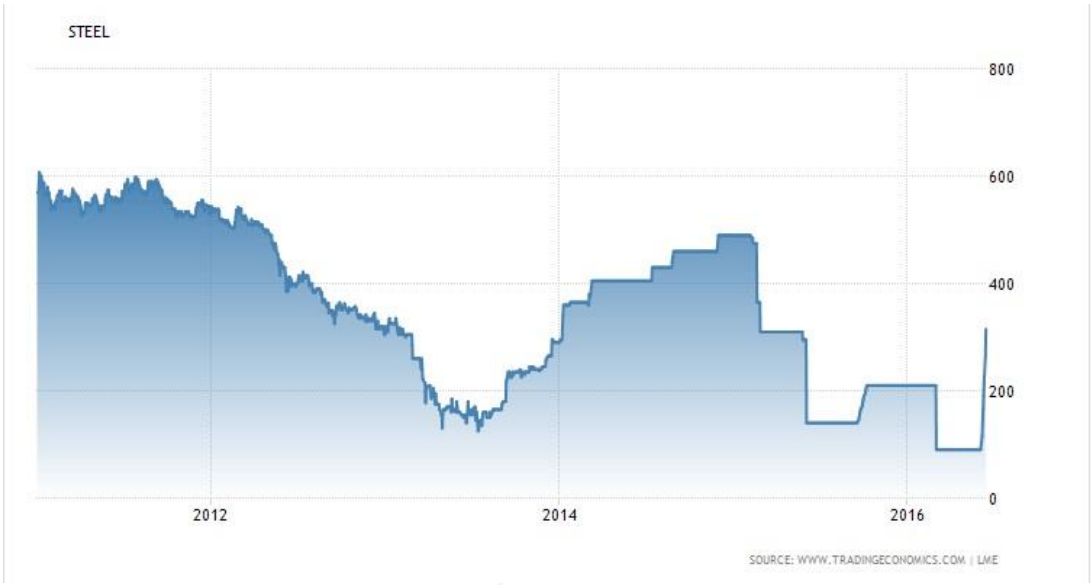


Figure 3 Steel price trend 5 years history

According to the figure 3 the chart shows the decreasing trend of data in pricing of steel. The first 2 years (which is 2011-2013) represents the big gap between the maximum and minimum price of steel in the global market. However, from 2014-2015 the price came back to the increasing trend but still not able to reach the maximum price as the same before. The price is showing that the trend of steel price went down almost every year. Because of those factors, the cost comes out with increasing in total percentage every year.

The last factor is cost of fee and administrative, based on the process of loading. The supplier will charge the company for operating in container loading. Another cost is

charge of damaged container. The cost is uncontrollable by company and effect on the cost of import.

Because of the problem as mentioned, the company decides to expand through the supply chain steam backward to control the variation of cost. And this study was evaluated on making the right decision of company based on the objectives as followed;

Research Objectives

To understand the available each alternative choices for the investment and then suggest the decision making process on the investment model to the company.

Research Expected benefit

Regard to the objectives, the result of benefit should be shown in the term of cost reduction which is significantly giving the price competitive of product production cost. This will reflect to the percentage of margin per product of the company directly.

Secondly, make all cost in the supply chain visible. In order to achieve cost effective strategy, the visibility that the research was applied will be advantages.

While obtain all the results of objectives, the expected outcome should show the results of 5 alternative choices of decision as followed;

1 Establish a new business by invest on the scenario itself by the company owned properties. However there are 3 alternatives available in this scenario.
    a) Establish business with company owned resources and complete management.
    b) Establish business by using joint venture model with electronic goods specialize partner
    c) Establish business by using joint venture model with automotive goods specialize partner

2 Establish a new business by invest on the project itself by investment in the industrial area. However there are 3 alternatives available in this scenario.

a) Establish business with company owned resources and complete management.
b) Establish business by using joint venture model with electronic goods specialize partner
c) Establish business by using joint venture model with automotive goods specialize partner

Scope of research

The research will covers two main analysis point of view, first the scope of the supply chain by cover in import machine cost, installation and time usage, land and expected cost that will occurred during the establishment process and the error that might occurred based on each supplier capability. Secondly the company scope will focus on the process of expanding business. The Mission, vision statement and cost reduction in order to gain the compatibility in the market. In this factor, the Hill's framework will be used for the scope setting and the direction of the thesis.

CHAPTER 2

Literature review

This chapter represents the theories that show the idea of how to use the tools and where the idea was created to make the best appropriate tool for the research. This chapter is consisted of

1. The theory that use for scoping all of the research to be on the same direction as Terry's hill framework.
2. The theory that used for understanding the company competitive advantage and capability to deciding to expand on the right path of its own resources by using the resources based view theory which VRIO will be used as the main tool of this analysis.
3. This use for analysis on the potential of outsourcing by focusing on the business market and environment itself. This process was created by using two tools analysis in the beginning 1. Total acquisition analysis 2. Total cost of ownership and this made out to understand of what supply chain capability is suit for.
4. The last analysis was focusing on making the choices to suggest the company on investment, whether or not on the collaboration analysis.

RESOURCES BASED VIEW

The resource based view strategy is the tool that was created by Birger Wernerfelt in his article A Resource-Based View of the Firm (1984). However, considering the root of the tool was written in the past before Birger who gathered all the sources from works by Coase (1937), Selznick (1957), Penrose (1959), Stigler (1961), Chandler (1962, 1977), and Williamson (1975), where emphasis is put on the importance of resources and its implications for firm performance (Conner, 1991, p122; Rumelt, 1984, p557; Mahoney and Pandian, 1992, p263; Rugman and Verbeke, 2002. To sum up, the definition of RBV would be define as "a model that sees resources as key to superior

firm performance. If a resource exhibits VRIO attributes, the resource enables the firm to gain and sustain competitive advantage said by Rothermal (2012), In this thesis the main purpose of using this tool is to get the company internal competitive capability. The process of RBV will be described as followed;

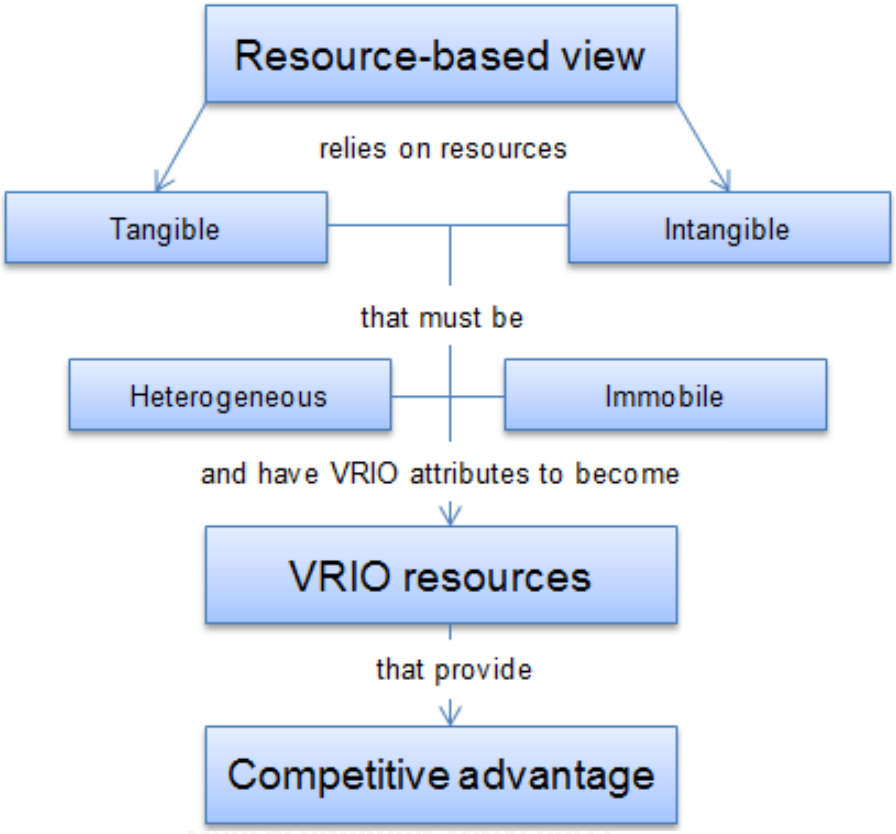


Figure 4 Resource based view analysis process

1. Gathering the resources information:

The resources will be categorized into two categories. According to O. Jurevicius (2013), there are 2 types of resources, tangible and intangible of the company. Tangible resource is the resource that permanently or visible to measure such as land, building or properties. While intangible resources are everything else that has no physical presence but can still be owned by the company. Brand reputation, trademarks, intellectual property are all intangible assets.

2. Analyse resources

After process on resources categorisation, by mixing both intangible and tangible resources together, the outcome of result will be clarify into two groups. The first group is heterogeneous resources are the company's skill that difference from other companies in the market. While another one is immobile resources which company's static resources, cannot be moved from one company to another at least in short-run. Such as brand equity, knowledge mostly is intangible resources.

3. VRIO analysis process

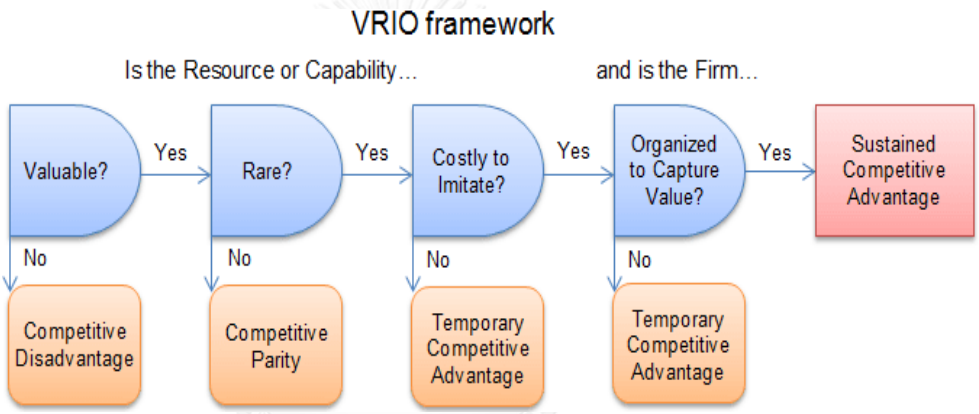


Figure 5 VRIO process analysis

The process of VRIO will identify the potential resources that exist in each step by categorising see in (Table 2), if the resource that selected able to pass all VRIO criteria, those resources will become the company sustained competitive advantage.

Table 2 VRIO definition by categorized

V	Valuable: the resource must value by enabling a firm to exploit opportunities or defend against threats. If the answer is yes, then a resource is considered valuable.
R	Rare: the resources that can only be acquired by one or very few companies are considered rare.

I	Costly to imitate: the resource that costly to imitate and if other organization that doesn't have it can't imitate, buy or substitute it at a reasonable price, or "low mobility" by Wade and Hulland (2004). Imitation can occur in two ways: by directly imitating (duplicating) the resource or providing the comparable product/service (substituting).
O	Organized to capture value: The resources itself do not confer any advantage for a company if it's not organized to capture the value from them.

To sum up for this thesis research, the theory of Resources Based View will represent the company's sustained competitive advantage (Figure 6.) which will represents the potential of cost evaluation on the investment.

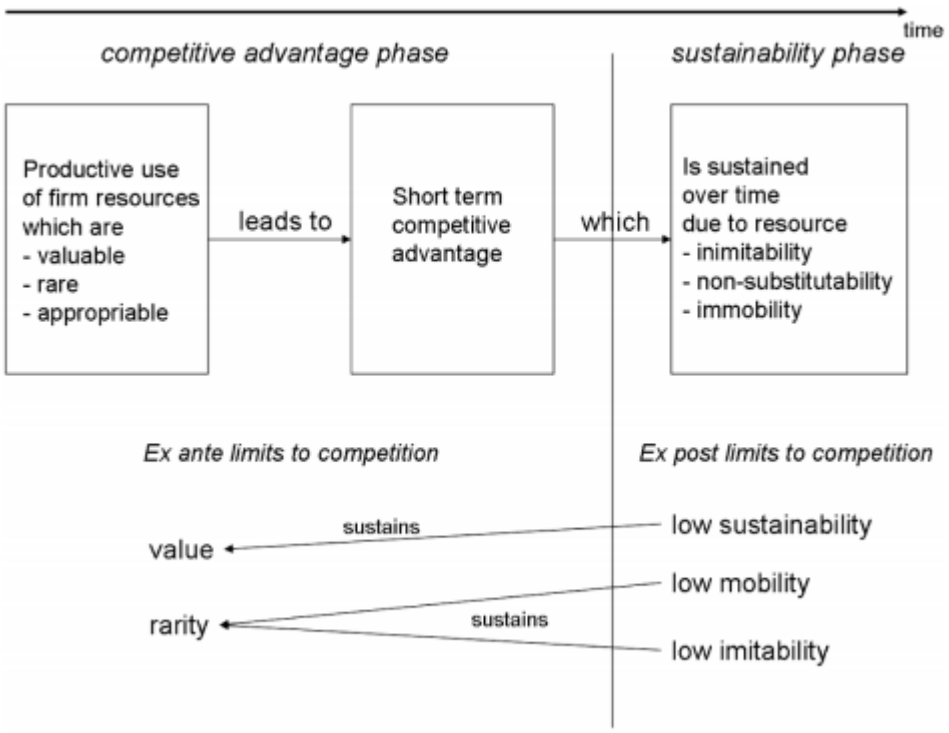


Figure 6 effects of VRIO Gerhard K. and Nick B. (2007)

The figure shows how the process of VRIO analysis can make the sustainable competitive advantage for the company. However this is the only advantage that cause by internal capability.

Operation strategy

The operation strategy of company, was created from many theories and ideas, that use for creating a business plan. The word "strategy" was defined by Johnson et al., 2008 as "strategy is the direction and scope of an organization over the long term; ideally, which matches its resources to its changing environment, and in particular its markets, customers or clients so as to meet stakeholder expectations." In this research the tool that author use to create the strategy is called Hill's framework.

Hill's framework

Hill's Framework (1995), the framework was created on the purpose of setting the operation strategy which establishes the company process choice and company's infrastructure. In this thesis study, the framework was created for purpose of scope of the research. The framework covers the organizational direction, marketing strategy and operation strategy. According to Terry Hill (1992), mentioned on the purpose of was to link markets to process production system and recognize the difference in decision making functions in manufacturing process and their difference roles within specific business.(Hill and Westbrook 1997)

The framework itself consists of 5 steps as followed;

1. Define the cooperate objective by answering the question as followed;

What businesses shall we be in?

• What businesses shall we acquire or divest?

• How do we allocate resources between businesses?

• What is the relationship between businesses?

• What is the relationship between the center and the businesses?

Business • How do we compete in this business?

• What is the mission of this business?

• What are the strategic objectives of this business?

Function • How does the function contribute to the business strategy?

• What are the strategic objectives of the function?
• How are resources managed in the function?
• What technology do we use in the function?
• What skills are required by workers in the function?

To define the first step there are tools that need to be used for creating cooperate objectives.

SWOT analysis

This tool will briefly make the understanding of company potential both inside and outside environment. The process to create SWOT matrix was defined by Terry's H. (1998)

The SWOT Process

"In order to leave the research environment as undisturbed as possible, members of the AC team undertook their first site visit when the analysis phase was complete or almost complete. As a result, we were not present at any occasion when a SWOT analysis was actually carried out, but we were able to question both clients and consultants on the process they went through to complete this task. The evidence is not complete—some memories were vague or contradictory. "

To create the SWOT analysis, gathering information was suggest by Terry's H. (1998) as followed;

1. By using the potential representative such as, an individual client company's senior manager undertakes the analysis alone, or a consultant does it himself after discussion with senior managers. This is the fastest and easiest process of creating SWOT analysis.

2. Several senior managers of a company would undertake individual SWOTs, which are then collated. This collation may or may not then be followed by a meeting in

which a communal SWOT is agreed. This method is more accurate than the previous method. However the time spending compare with accuracy is not worthy done.

3. The SWOT is the output from a meeting or meetings of managers, who all contribute to the final analysis. The meeting may be facilitated by the consultant or a client company employee. This should be used for a big organization that has enough resources and complexity of company structure.

SWOT analysis structuring method

According to G.J. Hay (2006) the criteria of SWOT analysis was defined as followed;

SWOTs are defined based on the following criteria:

Strengths are internal attributes of the organization that are helpful to the achievement of the objective include with the core competency.

Weaknesses are internal attributes of the organization that are harmful to the achievement of the objective.

Opportunities are external conditions that are helpful to the achievement of the objective.

Threats are external conditions and environment that are harmful to the achievement of the objective.

To sum up all criteria of SWOT analysis can be created as in figure 7.

	Helpful to achieving the objective	**Harmful** to achieving the objective
Internal (attributes of the organisation)	Strengths	Weaknesses
External (attributes of the environment)	Opportunities	Threats

Figure 7 SWOT criteria

TOWS matrix

According to Heinz W. (1982), the TOWS Matrix, was defined on 4 principles

(1) The WT Strategy (min- min). In general, the aim of the WT strategy is to minimize both weaknesses and threats. A company faced with external threats and internal weaknesses may indeed be in a precarious position. In fact, such a firm may have to fight for its survival or may even have chosen liquidation. But there are, of course, other choices. For example, such a firm may prefer a merger, or may cut back its operations, with the intent of either overcoming the weaknesses or hoping that the threat will diminish over time. Whatever strategy is selected, the WT position is one that any firm will try to avoid.

(2) The WO Strategy (mini--maxi). The second strategy attempts to minimize the weaknesses and to maximize tile opportunities. A company may identify opportunities ill the external environment but have organizational weaknesses which prevent the firm from taking advantage of market demands. For instance, an auto accessory company with a great demand for electronic devices to control the amount and timing of fuel injection in a combustion engine, may lack the technology required for producing these microprocessors. One possible strategy would be to acquire this technology through cooperation with a firm having competency in this field. An alternative tactic would be to hire and train people with the required technical capabilities. Of course, the firm also has the choice of doing nothing, thus leaving the opportunity to competitors.

(3) The ST Strategy (maxi-mini). This strategy is based on the strengths of the organization that can deal with threats in the

environment. The aim is to maximize the former while minimizing the latter. This, however, does not mean that a strong company can meet threats in the external environment head-on.

(4) The SO Strategy (maxi-maxi). Any company would like to be in a position where it can maximize both, strengths and opportunities. Such an enterprise can lead from strengths, utilizing resources to take advantage of the market for its products and services. For example, Mercedes Benz, with the technical know-how and the quality image, can take advantage of the external demand for luxury cars by an increasingly affluent public.

To create a TOWS matrix, 7steps are required as followed (Figure 8.);
The first step is answering basic information question on both internal and external environment of the firm or company that will be analyzed. The second and third step is totally different, concern primarily the currently and expected situation in respect to the external environment. Step 4, the audit of strengths and weaknesses, focuses on the internal resources of the enterprise. Steps 5 and 6 are the activities necessary to develop strategies, tactics and more specific actions in order to achieve the enterprise's purpose and overall objectives. During this process attention must be given to consistency of these decisions with the other steps in the strategy formulation process. Finally, since an organization operates in a dynamic environment, contingency plans must be prepared (Step 7).

<table>
<tr><td colspan="4">Step 1. Prepare an Enterprise Profile: (a) the Kind of Business; (b) Geographic Domain; (c) Competitive Situation; (d) Top Management Orientation</td></tr>
<tr><td></td><td colspan="3">Step 4. Prepare a SW Audit in: (a) Management and Organization; (b) Operations; (c) Finance; (d) Marketing; (e) Other</td></tr>
<tr><td>Internal Factors

External Factors</td><td>Step 5. Develop Alternatives

Step 6. Make Strategic Choices

Consider Strategies, Tactics, Action

Steps 1 to 6. Test for Consistency. Also Prepare Contingency Plans. (Step 7)</td><td>List Internal Strengths (S):

(1)</td><td>List Internal Weaknesses (W):

(1)</td></tr>
<tr><td rowspan="2">Step 2. Identify and Evaluate the Following Factors:
(a) Economic
(b) Social
(c) Political
(d) Demographic
(e) Products and Technology
(f) Market and Competition

Step 3. Prepare a Forecast, Make Predictions and Assessment of the Future</td><td>List External Opportunities (O):
(Consider Risks Also)

(1)</td><td>SO: Maxi-Maxi</td><td>WO: Mini-Maxi</td></tr>
<tr><td>List External Threats (T):

(1)</td><td>ST: Maxi-Mini</td><td>WT: Mini-Mini</td></tr>
</table>

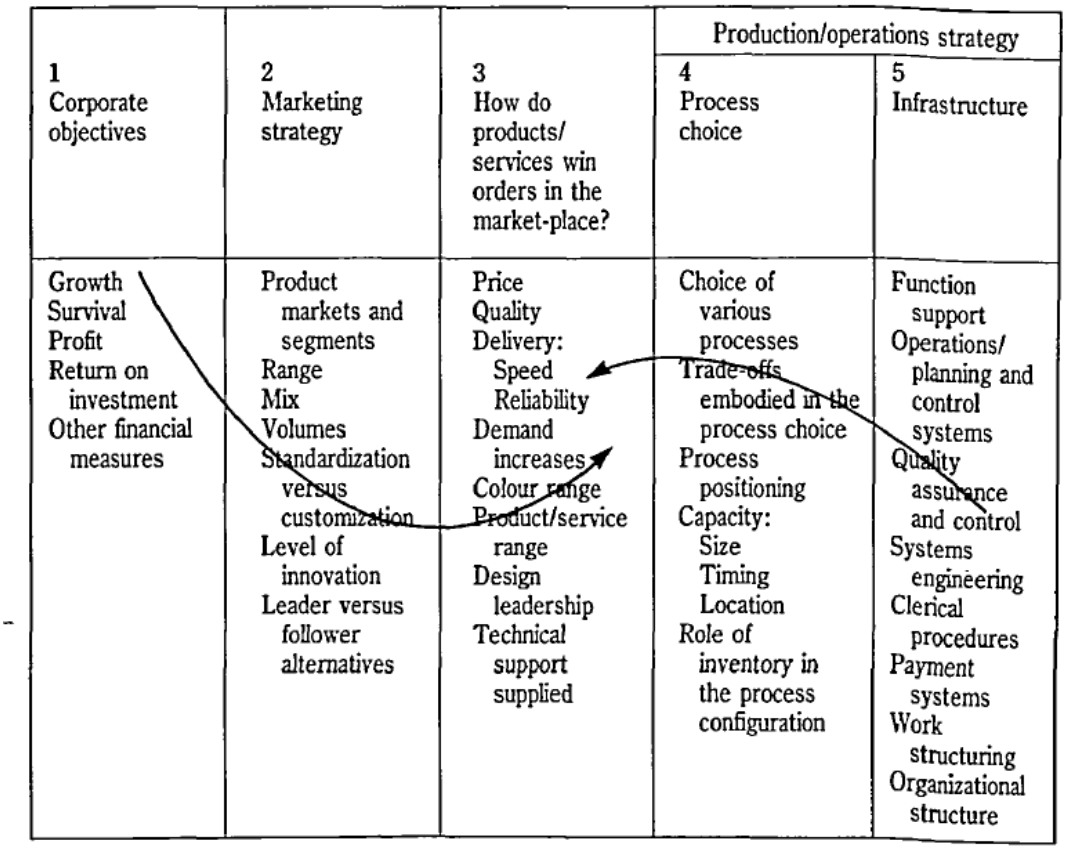
Figure 8 7 steps of TOWS matrix construction.

1 Determine marketing strategies to meet these objectives

2 Assess how different products win orders against competitors

3 Establish most appropriate mode to deliver these sets of products

4 Provide the infrastructure required to support operations



1 Corporate objectives	2 Marketing strategy	3 How do products/ services win orders in the market-place?	Production/operations strategy	
			4 Process choice	5 Infrastructure
Growth Survival Profit Return on investment Other financial measures	Product markets and segments Range Mix Volumes Standardization versus customization Level of innovation Leader versus follower alternatives	Price Quality Delivery: Speed Reliability Demand increases Colour range Product/service range Design leadership Technical support supplied	Choice of various processes Trade-offs embodied in the process choice Process positioning Capacity: Size Timing Location Role of inventory in the process configuration	Function support Operations/ planning and control systems Quality assurance and control Systems engineering Clerical procedures Payment systems Work structuring Organizational structure

Figure 9 Terry Hill's framework elements

The figure 9 show how every department in company has to merge the framework to make the company operation strategy flow to the right path. In This thesis the Terry Hill's framework will represent the frame of thesis scope and the achievement of company.

The scope of research according to the framework will start to set up on cooperate objective which relate to strategic marketing criteria. Both of the starting point will lead to show the direction of company but in the 3rd phase of the framework will be the considering how operation strategy on 4th and 5th can win orders in the market place.

Supply chain cost analysis will be gathered by 4 basis flows information to set up the cost of total acquisition cost and total cost of ownership. The total cost of ownership is defined here as a philosophy for really understanding all relevant supply chain

related costs of doing business with a particular supplier for a particular good/service. Total cost of ownership (TCO) considers total cost of acquisition, use/administration, maintenance and disposal of a given item/service. As will be presented later, TCO does not actually require precise calculation of all costs, but looks at major cost issues, and costs that may be relevant to the decision at hand by Ellarm (1993). In this thesis, not only use the total cost analysis but also analysis on the strategic outsourcing method by Bharat Vagadia (2012), To create all cost visible and understand the effect of decision making in project investment.

According to the classification of concepts for collaboration on supply chain, (M. HOLWEG, 2005) they create the model of classification based on two relationship of information on the supply chain line which represent in figure10.

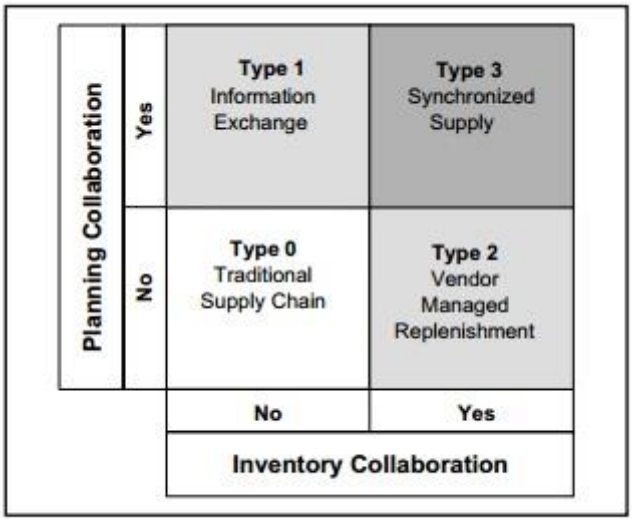


Figure 10 Collaboration model in supply chain

The figure show the relationship between inventory collaboration which is represent the product flow as mentioned in previous supply chain management with planning collaboration which represents the information flow. To make the right type of collaboration analysis, the information of partner an investment must be gathered and select the type to create the right decision.

Slitting line process

“ slitting is a shearing process used to cut wide coils of material into several coils of narrower width as the material passes lengthwise through circular blade” was defined by Todd, H. Robert; Allen, K. Dell; Alting, Leo (1994)

How can the metal coil slitted, according to Todd, H. Robert; Allen, K. Dell; Alting, Leo (1994) the process characteristics should be described as followed;

1. The material need to be Is limited to relatively thickness (0.001 to 0.125 in.)
2. The slit edges are normally burred present to some extent.
3. This method can be used not only metal (ferrous and non-ferrous material) but also include with plastic and paper
4. The amount of production quantity can be considered as mass production, width-control process

Process Schematic

A work piece (in this research will use the metal sheet as the main material) is fed horizontally through two offset cutting blades. The shearing forces of the two blades separate the work piece at the point of contact at the edge of the top and bottom blades as shown in figure 11.

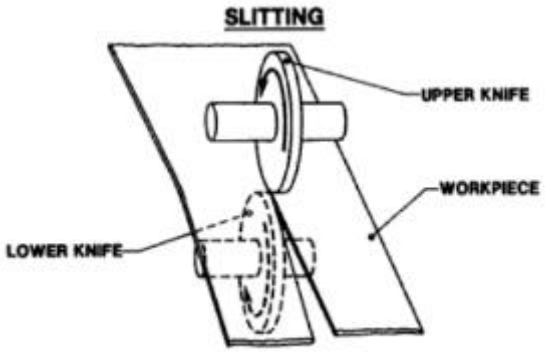
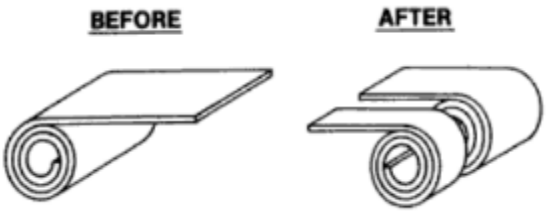


Figure 11 Slitting process by Todd, H. Robert; Allen, K. Dell; Alting, Leo (1994)



Work piece Geometry

A work piece used in slitting may be either in sheet or in roll form. Slitting is used for such products such as sheet steel, plastics, fabrics, and paper stock. As described in figure 12.

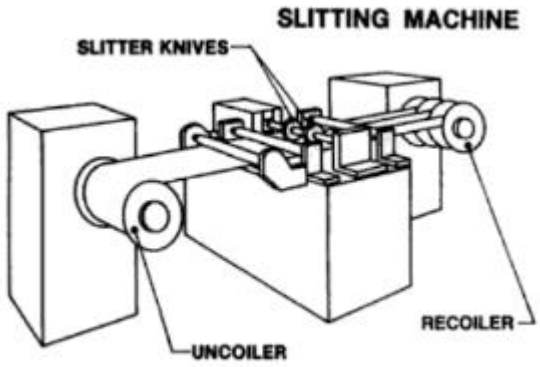


Figure 12 Slitting machine station by Todd, H. Robert; Allen, K. Dell; Alting, Leo (1994)

Setup and Equipment

The process line of slitter machines are manufactured in a variety of sizes, relative to the material and size of the roll being slit. The basic machine consists of an uncoiler which operate for loosen the coils layer, slitter knives (which operate for cutting the material according to specific widths), and a recoiler to make a new coil in another width dimension after slit.

Equipment and tools for slitting

The three slitter knives shown are typical of those used on slitter machine. The geometry of the blades is determined by the following (Figure 13):

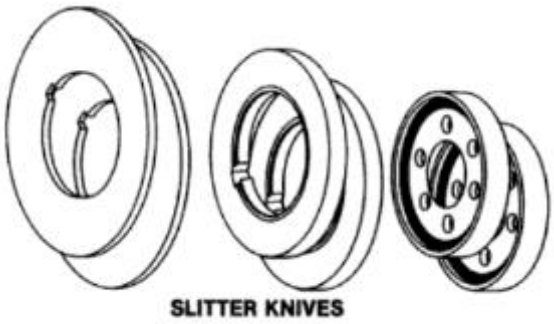


Figure 13 Shearing blade component by Todd, H. Robert; Allen, K. Dell; Alting, Leo (1994)

- Thickness of the work piece which can be in range (0.001 to 0.125 in.)
- type of material
- specified tolerances

Financial ratio and formula analysis

In this research to measure the value of investment is not only focus on strategy and resources potential but also the number and money will need to be concern as the factor of analysis. The measurements tools will be needed to use for analyse.
In this research, the financial part that the author will use for calculation will be consists of cash flow statement, NPV, IRR, ROI and ROI

“In financial accounting, a cash flow statement, also known as statement of cash flows, is a financial statement that shows how changes in balance sheet accounts and income affect cash and cash equivalents, and breaks the analysis down to operating, investing and financing activities. Essentially, the cash flow statement is concerned with the flow of cash in and out of the business.” was defined by Helfert, Erich A (2001) The cash flow statement in this research will be used for analyze each scenario into three cases the best possible case, the worst possible case and the

standard case. The amount of money that comes in and out of these scenarios will be stated.

There are 2 methods to use in cash flow analysis (Figure 14). The first method is direct method which easy to understand and used for explain the flow of cash in non-sophisticated way. This method was use for draft understand the situation of the company. While indirect method is included with company or organization structure, assets and liabilities to understand the whole company performance not each alternative to be specified.

Direct method

Cash flows from operating activities:		
Cash received from sale of goods	€xxx	
Cash dividends received*	xxx	
Cash provided by operating activities		€xxx
Cash paid to suppliers	(xxx)	
Cash paid for operating expenses	(xxx)	
Cash paid for income taxes**	(xxx)	
Cash disbursed for operating activities		€(xxx)
Net cash flows from operating activities		€xxx

* *Alternatively, could be classified as investing cash flow.*

** *Taxes paid are usually classified as operating activities. However, when it is practical to identify the tax cash flow with an individual transaction that gives rise to cash flows that are classified as investing or financing activities, then the tax cash flow is classified as an investing or financing activity as appropriate.*

Indirect method

Cash flows from operating activities:	
Profit before income taxes	€ xx
Adjustments for:	
Depreciation	xx
Unrealized loss on foreign exchange	xx
Interest expense	xx
Operating profit before working capital changes***	xx
Increase in accounts receivable	(xx)
Decrease in inventories	xx
Increase in accounts payable	xx
Cash generated from operations	xx
Interest paid	(xx)
Income taxes paid (see note**above)	(xx)
Net cash flows from operating activities	€xxx

Figure 14 Cash flow statement sample

The figure shows the detail of number and components that will be used to represent the alternative financial performance. However not only the cash flow statement

NPV: net present value or net present worth (NPW)

The NPV, in finance, was defined as “the total present value (PV) of a time series of cash flows. It is a standard method for using the time value of money to appraise long-term projects. Used for capital budgeting, and widely throughout economics, it measures the excess or shortfall of cash flows, in present value terms, once financing charges are met.” By Lin, Grier C. I.; Nagalingam, Sev V. (2000)

This value will evaluate the possibility of success in the investment project by calculated from this formula.

Each cash flow is discounted back to its present value (PV). Then they are summed. Therefore NPV is the sum of all terms

$$\frac{R_t}{(1+i)^t} = NPV_t$$

t – The time of cash flow statement in specific annual range of time (yearly, monthly, etc.)

I – The discount rate (the rate of return that could be earned on an investment in the financial markets with similar risk.)

R_t - the net cash flow (the amount of cash, inflow minus outflow) at time t (for educational purposes, R_0 is commonly placed to the left of the sum to emphasize its role as (minus the) investment.

According to the formula, the value of NPV means to be an indicator of project how value to be invest and answering the best value scenario in comparison. However, in reality, the NPV is not only calculated in the specific of time. To understand the exact money possibly gain from the project the formulation need to be analyze in all year that the research prospect.

$$NPV_{(i,N)} = \sum_{t=0}^{N} \frac{R_t}{(1+i)^t}$$

Table 3 NPV result and effect

IF	Result	Action
NPV >0	the investment has value added to the company in term of cash	the project is possibly to be accepted
NPV <0	the investment would make more liabilities to company	the project should be rejected
NPV =0	the investment do neither liabilities or profit to the company	need to add more factor for the decision

The NPV is the indicator that easiest and should be used in the beginning of research study (Table 3).

IRR: internal rate of return

This number is calculated for the rate of return only internal factor will be used. This ratio is used for knowing the percentage of return on investment directly through the cash flow information.

$$NPV = \sum_{n=0}^{N} \frac{C_n}{(1+r)^n} = 0$$

The formula itself was modified from principle of NPV formula which consists of;
The period n is usually given in years, as the same as t in NPV calculation
Any fixed time can be used in place of the present (e.g., the end of one interval of an annuity); the value obtained is zero if and only if the NPV is zero.

Often, the value of r cannot be found analytically. In this case, numerical methods or graphical methods must be used.
In IRR formula, r is the answer of IRR and need to have the cash flow statement components in the calculation. Understanding IRR will lead to the prospect profit on the total operation of the project.

ROI: return on investment

To direct define the definition of ROI itself is a tool to understand project by expecting from increases gains as show in figure below (Figure 15);

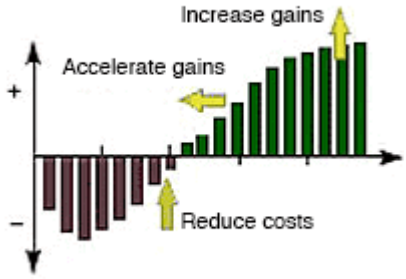


Figure 15 Cash flow reflects on ROI by Marty Schmidt(2016)

The formula of ROI can be described as followed;

$$ROI(\%) = \frac{(Gain\ from\ investment - Cost\ of\ investment)}{Cost\ of\ investment}$$

Gain from investment: In this formula will represent as revenue, income cash or the flow of money into the project without any of both internal and external factors concern to discount.

Cost of investment: The cost of investment is the total cost of operation. This includes the direct cost and overhead of the project.

ROI: is the number that shows how project invested return on profitability to the company.

Literature cases

According to Lei Y. (2008), the study shows that the successful of using resources based view along with tools of VRIN method was successful. In chapter 5 was mentioned that comparing with dynamic capability view (DCV) and resources based view (RBV) the more successful should approach on DCB for competitive advantage at the moment “Most previous empirical studies of RBV or DCV verify only one topic

per article, and treat different subjects of verification separately. This study uses a single group of subjects and applies a step-by-step empirical process to examine the applicability of the RBV and DCV to environmental volatility. Through examining 253 Taiwanese firms, this study finds that RBV is applicable when environmental volatility is ignored (cf. Barney, 1986; Dierickx and Cool, 1989; Grant, 1991; Newbert, 2007; Ray et al., 2004; Uhlenbruck et al., 2006; Wernerfelt, 1984). However, considering environmental volatility reduces the effectiveness and competitive advantage of resource firms (e.g., Eisenhardt and Martin, 2000; Newbert, 2005; Teece et al., 1997; Rindova and Kotha, 2001; Zollo and Winter, 2002). Nevertheless, the RBV is still somewhat effective, and firms with VRIN resources still have competitive advantages; however, this study finds that the DCV has better explanatory ability than the RBV." However, the result came out with both effective while VRIN can make more sustainability according to Gerhard K. and Nick B. (2007)

While Nisakorn S., Wonglimpiyarat J., Laosirihongthong T.(2012) study about Thai SMEs recommend that the owner of SMEs should consider on VRIN as a tools to exploit the potential of company as "As a business owner (especially SME owners), the SMEs can use the results of this study to adjust their strategic plans not only to survive in the start-up period but also to achieve sustainable competitive advantage. While incubation programs important for innovation commercialization, the success conditions lie in the SMEs' capacity to utilize unique resources and capabilities that are VRIN." Was the result from study with Thai SMEs during 2012. However, not only the suggestion of effect and successful of using VRIN as the base for analysis, but Nisakorn S. also recommend the local firm to use resources based view as a core of company development for gain competitive advantages.

CHAPTER 3

Research method and data collection

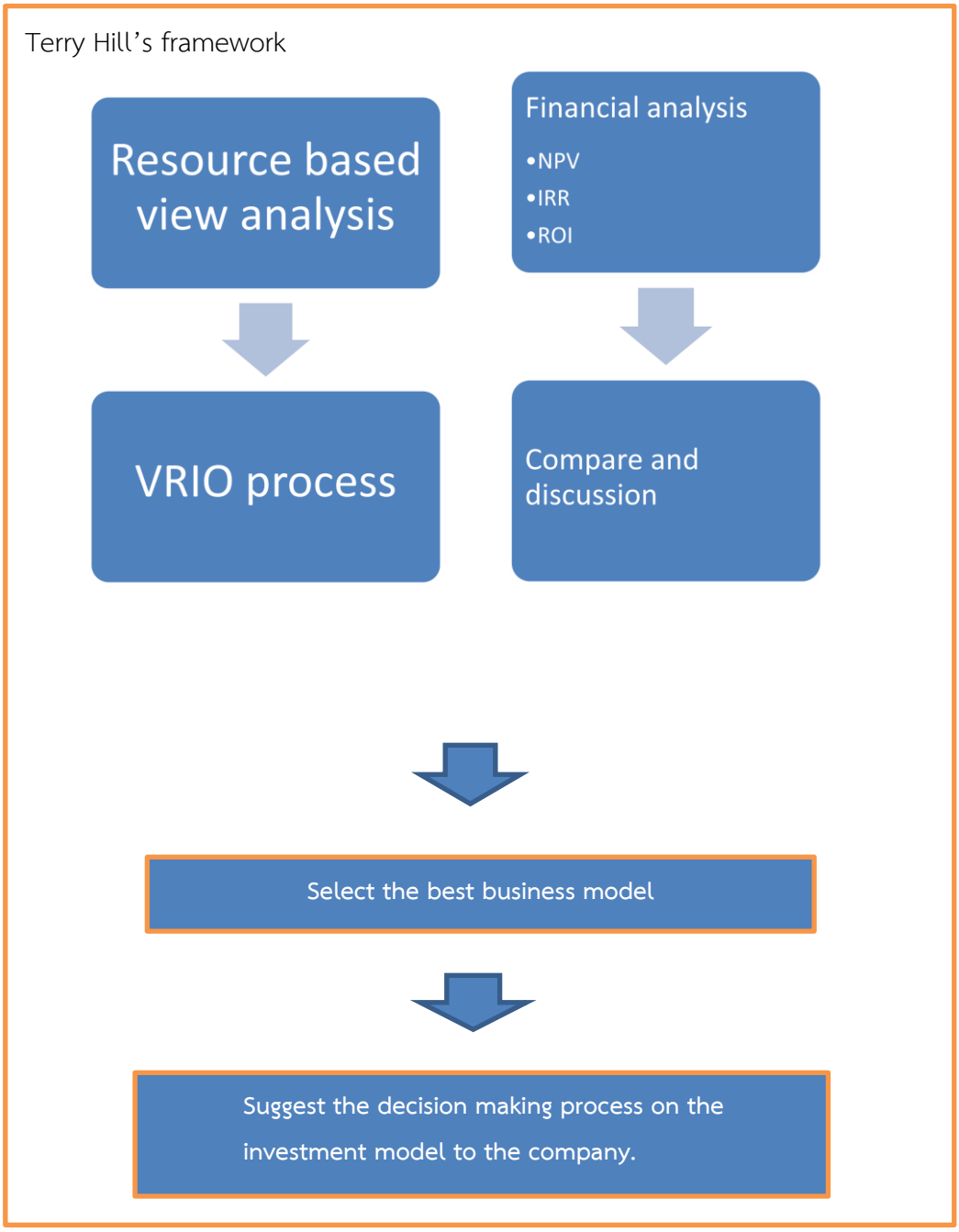


Figure 16 Thesis process diagram

From the literature review, the author uses Hill's framework, resources based view analysis and financial analysis by 3 financial ratios for answering the problem statement and thesis objectives.

The research procedure was created step by step (figure 16), the process show that company Hill's framework will scoping all both resources based view and financial analysis this include the factor that everything should answer operation strategy by Hill's framework.

To collect the data in each element on this thesis, the resources will be listed as followed;

Hill's framework data

The internal company information will need to be gathered by asking and collecting data from employee, senior manager and customer. While external data will be collected from customer from each branch and sales person from 12 branches and in the head quarter of company.

Resources based view analysis

The data will need to be gathered by paper base analysis based on external factor. However the internal factor will get the data along with hill framework during the process of data collection.

Financial analysis

This part uses the data from actual number from accountancy department and number from standard price in Thailand. 5 Years limited investment calculation. Which have the financial assumption before get in to analysis as followed (table 4);

Table 4 Financial assumption

Company's owned location		
1.1	1.2	1.3
Smallest sales amount (75-235MT)	Increase in Viriya's sales price (2%)	Highest sales amount (105-250MT)
sales growth (25-40MT/y)	sales growth (25-40MT/y)	sales growth (25-40MT/y)
SMEs tax (15-20%)	SMEs tax (15-20%)	SMEs tax (15-20%)
Industrial zone location		
2.1	2.2	2.3
tax privilege(0%, 7 years)	tax privilege(0%, 7 years)	tax privilege(0%, 7 years)
Free machine import vat (0%)	Free machine import vat (0%)	Free machine import vat (0%)
Labor cost (5%)	Increase in Viriya's sales price (2%)	get more sales from local firm (130 - 260MT)
sales growth (30-50MT/y)	get more sales from local firm (125 - 260MT)	sales growth (35-50MT/y)
	sales growth (30-50MT/y)	

CHAPTER 4

4.1 DISCUSSION

Company's hill framework

Before getting into deep detail of analysis, the first and foremost process need to be done is hill's framework to create the scope of company to the right decision

Hill's Framework

According to post module assignment of Phumikron Viriyarungrong in operation strategy for industry (2013), the hill framework of Viriyalohakij mostly remains the same. In this resrach the author will only pick the strategic that will be used to scope the research, however in total strategic planning in operation will be add in the appendix. the author add some update data on the current situation of company and market on 2016

SWOT analysis

The initial process on information gathering is SWOT analysis. SWOT analysis (Table 5) is the tools that give information on current situation of both inside and outside environment of company.

Table 5 SWOT analysis

strength	Company's production skill.
	Company's branches.
	Company's product range.
weakness	One man centralizes system.
	No international standard approve.
	Material price fluctuation.
opportunity	New trend of using construction material.
	New coming investment project through local

	area.
	Strong market barrier.
Threat	Government policy.
	Product complexity.

Strength: The strength of company was built on 3 principles of company to aim to be the best in cold roll business. First is production skill, according to the market survey the company production skill of Viriyalohakij shows the potential based on number of worker and the production line itself. Due to the characteristic of shutter door product, the company is one of a few that achieve the complete line of production. Another strong point of company is access channel. The company is the only one in market who expands the access channel to customer via branches owned by company itself. Mostly still do the centralized and use sales to run over the market channel instead of permanently branches which gain an advantage to access to each part of Thailand. The last strength of company is versatile product range, based on shutter door product characteristic, the company can offer the price and material from the cheapest in the market to the most expensive in the market.

Weakness: The one man show management system was establish as the root of company culture that was born from the one man who do everything in company without system in the past. This mind set still setting in the company and still become the obstacle of company to complete the system in global standard. Another weakness is the power of bargaining in raw material price. Since the company doesn't have enough quantity to achieve the big amount of bargaining price.

Weakness is the standard of shutter door does not currently exist in the whole process. Any company can set their own standard and the problem will occurred when different standard in each company make the different in parts and components. The last thing is material price is uncontrollable, according to the steel

price market trend recently years; the fluctuation of pricing is very high and very difficult to predict. This cause lost in exchange rate and sunk cost of holding stock.

Opportunity: Recently in Thailand market, the metal roofing (one of company roll forming product) product is becoming more popular instead of others roofing material." The market was predicted that will be 9%" market growth a year sourced by Bluescope steel company (Thailand) and Brooker Market Research Limited. However on past 3 years (2014-2016), many new competitors get in to the market and spread all over the country on the metal roofing product. With this growth size of market can be a great opportunity. Not only the chance of production but also the government policy to expand developing area throughout the local area around Thailand also affect to the land's that company owned.

Threat: in September 2012, the government has launched new anti-dumping policy against importing raw material of metal forming business to Thailand. Because of the complexity of production and installation of product, This also include with coming new anti-dumping policy of import tax on Vietnam cold roll firm in August 2016 said by Nam-Kim steel the company always need the skilled worker to install the product. The problem is in this recently days. Thai worker is very difficult to find and have to pay more and more salary every year.

To sum up, the current situation of company has many inner company problems but the opportunity in the market still have enough growing rate for the company to growth following the trend. In order to know the present situation that company is facing now. Terry's modified hill framework is the best tools that suit to manufacturing company to analyze the current operation strategy of the company. However, not only the SWOT tool will be used as the main tool in strategy creation but also environmental need to be concerned as a factor that effect to company. PESTLE analysis will need to be used. In this research, according to Management of Change module PMA by Phumikron V. (2014) the analysis was taken as followed;

PESTLE analysis

TOWS matrix is not only concerns with SWOT analysis. The PESTLE analysis will use to expand the effect of external environment of company along with threat and opportunity information.

P: Political

The current political situation has been changed during these past years, due to new military government. Thailand's law had been changed faster than the past and most minority laws doesn't based on voting but by judging. New laws will easily to be applied or not is based on the judged and this is called competitive of power period.

E: Economic

According to post module assignment of international joint venture module (2014) by the author, the economics of Thailand would be described as followed.

The growing of economic scale of Thailand based on GDP volume is almost stable every year. However during these 5 years period from 2007-2013 (Figure 17), the growing is very slow based on the political situation and the big flood situation occurred on 2012. The economic is coming back growing slowly. This factor doesn't have much effect to the business market. This mostly refers to the capability of population in order to purchase our product and services. Based on ASEAN community economy scale expansion, the human resources will be freely relocated. In Thailand as one of the leader of ASEAN community, the English skill will become more and more important in order to maintain the current human resource capability and also to accept the new coming work force.

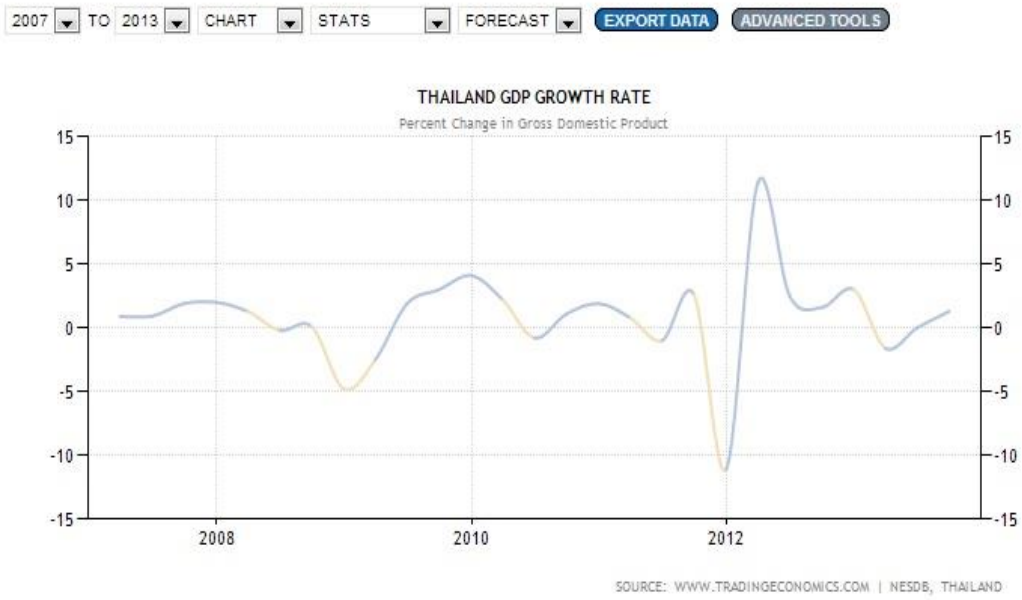


Figure 17 Thailand GDP growth rate from 2007-2013 adapted by author from http://www.tradingeconomics.com/thailand/gdp-growth

S: social

The current Thailand's situation in purpose of living was changed on house focus to the condominium recently years. However, in contrast, the new trend of living is coming in home office which suit for new business and start up. This changes lead to the bigger market of company. Because home office in Thailand always need shutter door and metal sheet for roofing in design flexibility and protection of the house itself and cost of construction.

T: technology

The roll forming business, include shutter door product, is going to be easier to achieve. The price of this type of machine is dramatically decreased in 5 years. The price was dropped by the Chinese company machine manufacturer. Comparing with other construction material the shutter door product is one of the high complexity products. The amounts of components for one complete set of products are more than 20 parts. The smart phone technologies are applied to the field as a tool for communication with the machine to control the door. This is a new and complicate field that the company still not possible to get through the field.

L: legal

In 2016, Bluescope began to successfully apply anti-dumping policy against Vietnam. In September 2012, the BlueScope Company ,who is the biggest in cold roll production manufacturer in Thailand, had cooperation with Thai government and launch the policy of anti-dumping against China, Taiwan and Korea. The import duty has increased for more than 40% that leads to the local and small business loss of competitive power. Hence that the supply chain of the business has changed to Vietnam.

E: Environment

The product itself doesn't concern on the environment. In fact the material concerns for the environment will be more prioritize. In this case, According to the study of Mc-Graw Hill construction partnership with United Technologies, the results clear that the green building is growing globally. 28% of architects, engineers ,contractors building, building owner and building consultants around the world report that they are focusing on their work on sustainable design and construction by doing at least of their project green, doubling from 13% of them this level in 2009. Since the trends has come the company will need to adapted itself to achieve the new market share of new market segment

Conclusion

The external capability of Viriyalohakij's PESTLE analysis can be represent the market capability gap that still left for this business. The risk of political issue is one of the top priorities to concern for external policy. The economic itself is the reflection of political issue stability. In this present time the external capability of business in Thailand is still unclear from the top. In Thailand, social has been changed during these 3 years that support the market to expand more. However the global trends that looking for more simplicity, high labor cost and more green production will be the trends that should be taking in concern.

VIRIYALOHAKIJ TOWS matrix

After the gathering the information both SWOT analysis and PESTLE analysis, the author construct TOWS matrix according to the information that mentioned.

Table 6 VIRIYALOHAKIJ TOWS matrix

<table>
<tr><td colspan="2" rowspan="4">TOWS matrix</td><td>O</td><td>T</td></tr>
<tr><td>New trend of using construction material</td><td>Government policy</td></tr>
<tr><td>New coming investment project through local area.</td><td>unstable global economic</td></tr>
<tr><td>Strong market barrier.</td><td>Product complexity.</td></tr>
<tr><td rowspan="3">S</td><td>production skill</td><td rowspan="3">SO : extend production skill of company to achieve new demand on the trend of construction material create the production line cover all parts that cannot let others competitor to get in the business</td><td rowspan="3">ST : cooperate with government to survey and improve the production according to government policy and expectation
Focus the production skill to obtain the standard and overcome difficulty of product management expand the</td></tr>
<tr><td>branches</td></tr>
<tr><td>Versatile product range</td></tr>
</table>

			number of product variety to cover the gap of unstable economic
W	one man show management system no standard of product uncontrollable in raw material price	use the demand of new trend on bargaining the price of raw material	applied more promotion to bargaining in demand both sales and purchase power expand the number of product variety to cover the gap of unstable economic minimize the cost of production to stable to margin

The TOWS matrix (table 5) shows the strategy of company and direction on to maximize the SO and minimize the WT as the first priority and come up with these company objectives.

Company objective

The company was set the vision since it established the business even it pass for more than 10 years. The company still remain the same vision. However, according

to new update of analysis which are SWOT, PESTLE and TOWS matrix, this cooperate create the mission as followed.

“To become the leader and most flexibility of cold roll metal forming company in Thailand”

The mission of the company in order to achieve the goal would be set as followed:

- International standard production process.
- Leader in flexibility and made to order production.
- Serve the customer with the one stop service as the steel coil business leader.
- Become accessible local customer through branches around Thailand.

Short term goals, objectives and targets

1. The amount of sales should be reached to 200million THB within three years.
2. Decrease the ineffective man power cost for 10%
3. Reduce the scrap and waste for 5%

Company marketing strategy

The current company marketing strategy still focus on by using psychographic marketing segmentation method to analyse the company customer is the most suitable tool.

The main company customer can divide by two individual customers based on the size of project.

1. The big project customer (Business to Business): this type of customer has a very great volume of money to purchased goods. However the margin is very low because when this kind of customer starting the project, the purchasing department always looking for the cheapest company. That means the company need to get in to a competition of bidding and get the cheapest price.

2. The individual customer (Business to Customer): These types of customer normally have a limit of demand. However this kind of customer doesn't have much advantage in bidding the price and the company can get a high margin on this type of customer

According to the research which is focusing on expanding the supply chain to the upstream, the customer segment of company will need to be considered as the potential effect in the result while investment is analysing.

Product range

In this research the company will focus on using only shutter door product, since the most use of product in company will only be shutter door product. Regard to WMG 2013 OPP PMA,

The Puttrick grid

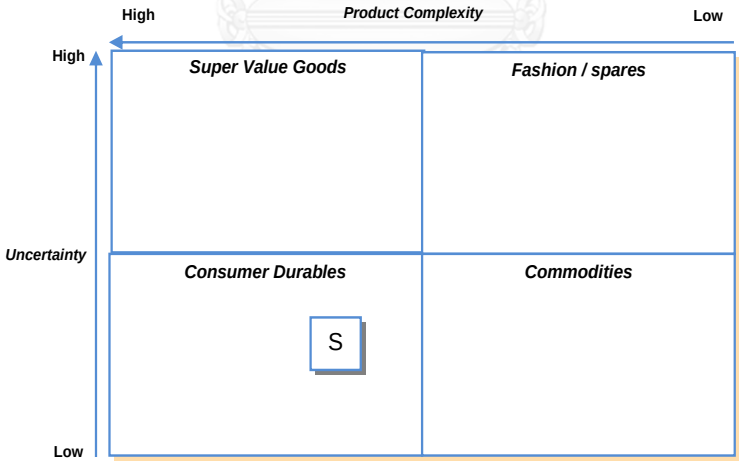


Figure 18 Viriyalohakij's product Puttrick grid

In the Puttrick grid (Figure 18), the product shutter door represent as "S" in the diagram, while "M" represent for another main product as metal sheet for roofing. Regard to the character of shutter door, the complexity of product is the reason why this product is low uncertainty is because the number of competitor in the market.

The easiest path for reaching to the top of the market, the investment on this product will be focus more in shutter door.

To sum up company marketing strategy, in this research, the company shutter door product has enough potential of growth and worthy to invest for better improvement product in the market, especially when the company customer segment is included with the B2B business sector. The cost competitive will be a lot more advantages.

Products order win in the market place

Using the tool called "winder/order qualifiers/less important objectives to understand the view point of customer in the product and what should be improve in order to maximize the potential of product fits to the customer need. The information was questioned by each branch's sales person. The results were gathered as average and prioritize according to the information as followed;

To perform the judgement, using criteria as (table 4), and the criteria will be set priority as order winners (W), order qualifiers (Q), less important objectives (L).

Table 7 Criteria references for products order winner

Criteria	Definition
Complete	the product set should be a complete package nothing miss out
Durability	the product durability; life time
Design	the design of product should be attractive
Quality	every part of product should be strong attached
Price	the price of product
Speed	time to the customer
Green	product has effect to environment
availability	the product is able to purchase at the moment or not

Table 8 product order winner

criteria\product	S
Complement	Q
durability	Q
design	Q
quality	W
price	W
speed	Q
green	L
Availability	Q

The table shows how shutter product order/winner in the market. The most important criteria are quality (W) and price (W) which stand out of each criteria. Because of that statement, the company started to import the raw material since 2013 aiming for cost reduction as main advantage. Furthermore recently January 2016, the company starts to change the main structure of shutter door both processing and end product to gain more quality and pricing advantage.

Five performance objectives

“The big five operational objectives adds value for customers and contributes to competiveness by being able to satisfy the requirements of its customers. It uses key performance measures to align the needs of the customer with the desired effectiveness of the overall business. “

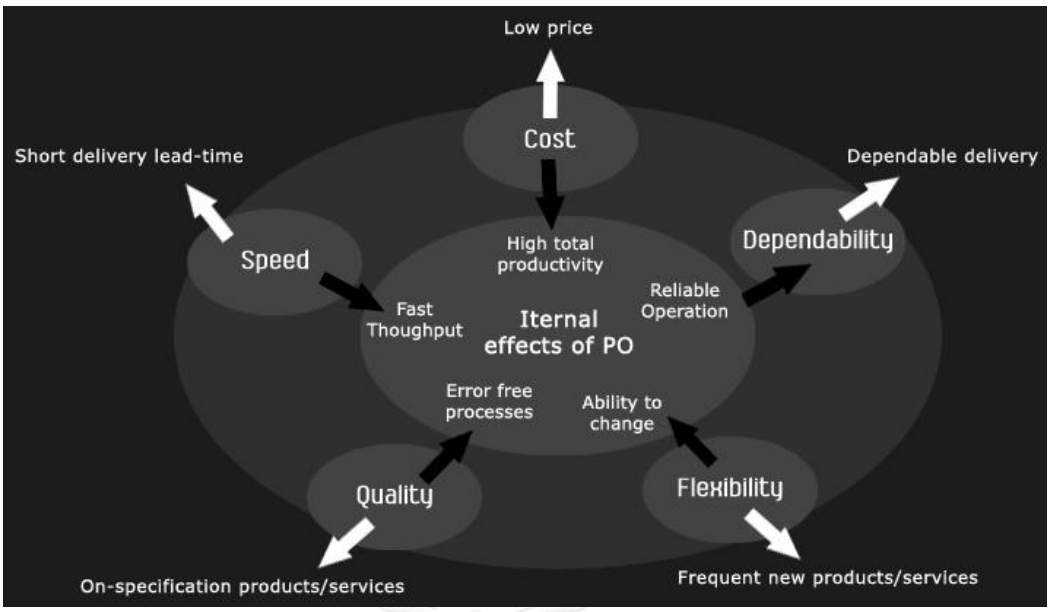


Figure 19 Porter's Five performance objective diagram

According to the definition of five performance objectives by beyond and order winner which established by author, the products can be contributed by both competitiveness ability and the customer perceptions. However to conclude both criteria together in one diagram in order to analyse the current performance of the product that meet the customer perceptions or not, polar diagram is the answer.

Polar diagram

This polar diagram was constructed based on shutter door product which is first priority product in this research. The diagram shows according to the performance of 5 forces model effect the product itself.

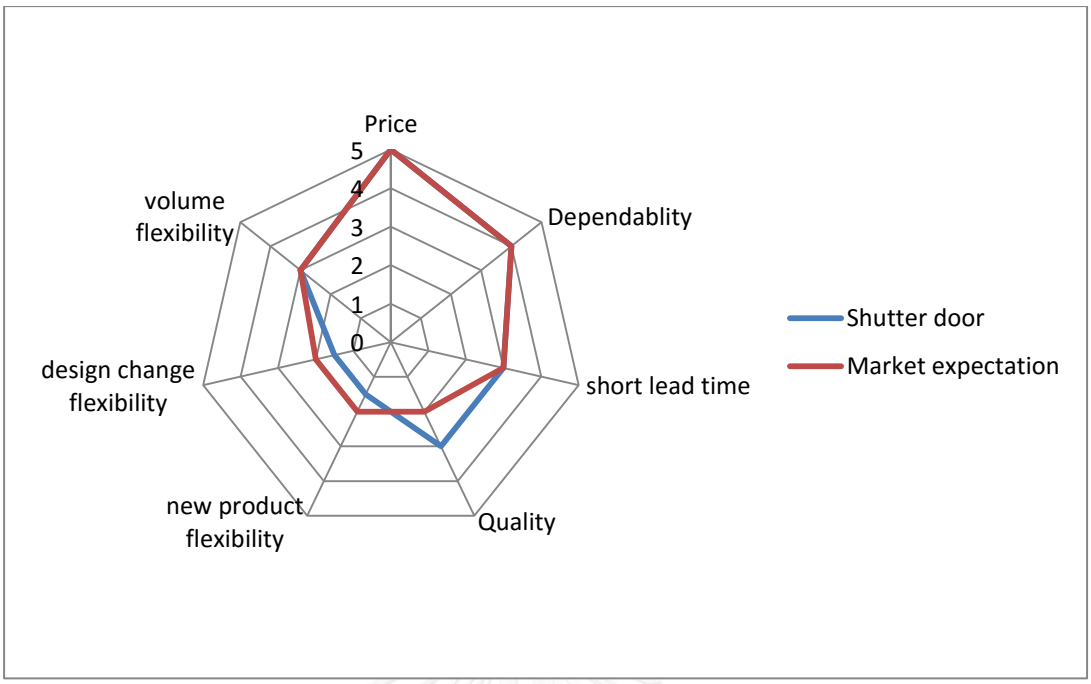


Figure 20 Polar diagram of shutter door product compare with market expectation

The figure 20 shows what perspective of customer compares with the current company capability in the market by polar diagram which use the information from orders winner of the company to create the market expectation, in the other hand using current company information to create the diagram on its own.

The price of shutter door product now are almost reach to the best price achieve in the market so in this criteria is no worry for the company in the market to reduce the selling price. While another criteria which is dependability of the product itself is a construction component.

While the quality of shutter door of the company is already beyond the standard since the R&D department has been creating the research for making the shutter door more user friendly and easy to install than the others. The company developed the products based on customer

Hill's framework summary

According to the 5 sections of Hill framework, only section 1, 2 and 3 will be used in this analysis. The summary of section 1 comes out in the result of company vision, goals and objectives. This section will answer the direction of company that this research investment will able to obtain those expected goals or not. While section 2 is the marketing strategy that the research will need to be able to adapt with company marketing strategy which aiming for business to business sector. In the section 3, the order winners of product will represents how customer view to the product valued that focus on quality and price, however, this research was aiming for the cost reduction and quality control of the material as well.

The slit line machine process investment and capability

According to the research, this will take back to the investment alternative choices; the machine itself can be described as followed;

The company location is located under the property of VRG co., ltd. company which is the main company above VIRIYALOHAKIJ co., ltd. This company was established on the purpose of leasing and renting the land and facilities (which are warehouse and factory) in the area.

The investment required 2 main functions to operate

1. The machine process line which requires 5mx15m area and process operation will be used for 200 square meters for both operation machine and collecting material.
2. Operation system team, the area of office which required for selling, HR, management people will require 400 sqm. Including work space and total area facilities.

To sum up, the VRG will provide 800 square meters warehouse for rent.

VIRIYALOHAKIJ resources based view analysis

Phase I: Resource analysis and gathering data

Resources gathering process in 2015 the current resources of company categorized in term of tangible and intangible of companies are as followed;

1. Tangible resources: the company building, the land and location of company Viriyalohakij company location have an advantage by locating in the middle of Thailand which is the biggest area of agriculture and infrastructure material business industry.
2. Intangible resources: Viriyalohakij owner is very adaptive person, who always do the R&D and non-stop improving process of production. Many parts that was built for shutter door production was created from him and lead to the unique design which solve many problem of previous generation of shutter door.

The information that considered consists of two assumptions, which are heterogeneous and immobile resources.

Heterogeneous resources: company's location, company R&D results and company's IT management capability and IT resources performance, company's branches.

Immobile resources: company's location, company branches and company R&D results.

So, the resources that can be used are 1. Company's location 2. Company branches (access channel) 3. Company R&D results (design patent). 4.product range.

Phase II: VRIO analysis

VRIO process (can be used as stick to the supplier alternative analysis)

The resources must be analyzed based on criteria as followed;

Value: all there resources are considered as valuable resources based on the condition to create or exploit the opportunities against threats which all 3 resources are achievable. However the most stand out of company's value resource is product range.

Rare: Regard to the condition, the location will not able to be substituted and also, the company expects to use the location as the based to capture and gain competitive advantages. And become the rare because of only Viriyalohakij is capable to do this business on the location.

Costly to imitate; company's branches and brand image is costly to imitate because both resources not only invest in money to buy location and place but also need time to create the value which are all intangible resources and undeterminable value. Hence that, these resources will become non-substitutable and costly to imitate.

Organized to capture value: The resource that was created on the purpose of capture the value of Viriyalohakij are R&D of company. This resource is the core that uses for capture the value which is product ranges the most.

To sum up, according to Gerhard K. and Nick B. (2007), the resource of company which is location based has the potential enough to exploit the company competitive and sustainable from the view of resources based view analysis. In figure 6, the location shows the route of transportation which easily to access to north, north eastern and direct to the Bangkok. The distance from company location to Bangkok is 118km, to center of north eastern 150km and to the north center is 186km. Which mean the location itself are Value, Rare, and Costly to imitate itself. Not only the distance advantage, but also the new coming investment project which is approved by current government shows the closed path to company location in both express way and high speed train.

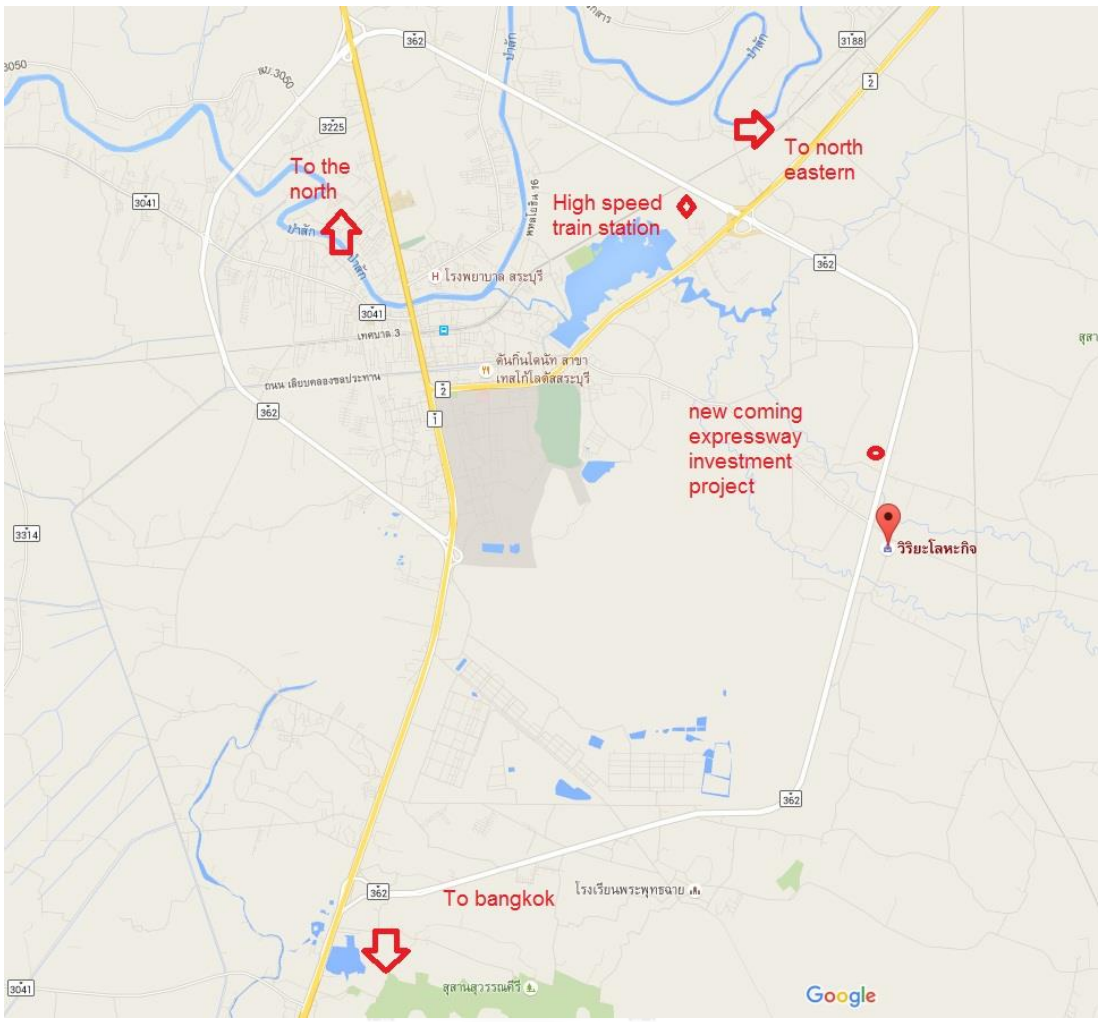


Figure 21 Viriyalohakij Company's location

Based on VRIO of VIRIYALOHAKIJ results, to increase company competitive power will need to use the location as the main resources to apply with company strategy. According to company strategy, the resources show the potential itself to get close to achieve vision and mission statement of the company.

Scenario analysis

According to problem statement of this research there are two main decisions to be decided by company

1. Establish a new business by invest on the project itself by the company owned properties. However there are 3 options available in this scenario.
    a) Establish business with company owned resources and complete management.
    b) Establish business by using joint venture model with electronic goods specialize partner
    c) Establish business by using joint venture model with automotive goods specialize partner
2. Establish a new business by invest on the project itself by investment in the industrial area. However there are 3 options available in this scenario.
    a) Establish business with company owned resources and complete management.
    b) Establish business by using joint venture model with electronic goods specialize partner
    c) Establish business by using joint venture model with automotive goods specialize partner

To be more specified the author has create the sub alternative as an option for the company to decide according to the information as followed;

SCENARIO 1

Alternative 1.1 the investment contribute by company owned land properties

SWOT analysis

Table 9 Alternative 1.1 SWOT

Strength	Company owned location has its high potential to expand
	closed relationship with the main company
weakness	the company doesn't have strong branding
	Losing opportunity cost for the land.
opportunity	the coming project of transportation goods
	city planning to develop the province to focus in industrial
Threat	there's no cluster of industrial that support the product in closed area
	Difficulty on processing with government staff.

The SWOT analysis according to table 8 shows the potential of investment on company's owned represents the detail as followed;

S: strength, the strength in this alternative shows that the company area(main company) gain advantage on the area potential which is the main customer of company and closed relationship that labor and resources are possible to rotate to each other.

W: weakness, the weakness of construct the project in the area is company has low identity to show its attraction to the new customer which is the capacity of production need to be fulfilled. Furthermore, based on main company coming project, this investment project doesn't suit to the company plan and difficulty to to gain more advantages from neighbors companies.

O: opportunity, the current plan of both government and local administrative are going to support this area a lot more than the pass. According to VRIO analysis in the previous section show those two new government investments which are focus on

new express way and high speed train in the local area. In addition, the local policy also supports the area itself on city plan to create the province to be more focus in industrial segment.

T: threat, the obstacle is the area itself doesn't have any closed customer except main company which is only VIRIYALOHAKIJ co., ltd (main company)., however there are two small local customer which stand on the same road. There is no support tax policy from government in this private area.

Gathering the information of SWOT analysis, the investment project in this alternative can be contributed according the strategic and resources from TOWS matrix as followed;

Table 10 Alternative 1.1 SWOT

<table>
<tr><td colspan="2" rowspan="3">TOWS matrix</td><td>O</td><td>T</td></tr>
<tr><td>The coming project of transportation goods.</td><td>There's no cluster of industrial that support the product in closed area.</td></tr>
<tr><td>City planning to develop the province to focus in industrial.</td><td>Difficulty on processing with government staff.</td></tr>
<tr><td rowspan="2">S</td><td>Company owned location has its high potential to expand</td><td rowspan="2">SO: the project will aim for using the close relationship gain the advantages on coming government and local projects.</td><td rowspan="2">ST: the company will use the main company to take on advantages cover the threat of no support from government in tax policy and transportation cost</td></tr>
<tr><td>closed relationship with the main company</td></tr>
<tr><td>W</td><td>the company doesn't have strong branding</td><td>WO: using the coming opportunity to overcome</td><td>WT: to minimize this field of analysis, the</td></tr>
</table>

	Losing opportunity cost for the land.	and pick the addition investment for the project.	company must do negotiation with the local administrative to ask for the plan and support for development together along with main company and project.

The table shows how the strategic of the first alternative can be conducted, the strategic getting from SO, ST , WO and TT from the table will created the perspective resources and will be used in analysis from VRIO as followed;

TOWS matrix assumption

From the interview of managing director of Viriyalohakij in project planning of investment, by representing the SWOT analysis and TOWS matrix, the selection was made on SO factors to maximize strength to achieve the opportunity as the first priority to go on action plan.

Alternative 1.1 VRIO analysis

The analysis resources will include with the main company resources for analysis since this project will invest in the company land.

Tangible: The current resources are company building, land, branches, employee and the stock, static material, slitting line machine.

Intangible: The asset of company in form of intangible will represent of R&D patent, the company it system, security system, slitting process and online market channel, closed relationship with the main company.

Value: The company resources that value added from the scenario will be the location of company since all of the north eastern and middle through the south-north of Thailand still has no line of slitting machine established. R&D resource will

gain more advantage in case of other resources will affect from the scenario by gaining on company brand image of expanding.

Rare: The scenario itself create a new rare resource of company, the company will gain advantage in the area of 300km. radius (not include Bangkok) that can gain the advantage of service in this part. Those resources still maintain the same potential in rare by IT system, R&D research. However the resources that gain more rare value will be company location, branches most are tangible resources. Only one will be gain from intangible resource are access channel and product variety.
Costly to imitate: The new investment project is one of the most costly in the business firm to invest, consider the resource as the costly to imitate will be focus on location and the process line.

Organized to captured value: the process line itself focus on steel sheet processing which easily can be substitute by any other method. However what different is quantity and processing time. The process affect will not only occur on shutter door product but also any other forming line in the company as well. The company was organized to achieve the best cost effective which means the process line is one of the key factors.

Conclusion

To sum up, this scenario will expose the potential of company not only in term of cost reduction and price competitive but also gain the advantage of new market segment access and become more one stop service for any customer. In contrast, the investment can be consider as an disadvantage in financial statement and losing opportunity to invest in other direction of company.
The investment contributes by joint venture with specific partner. In this scenario there are 2 alternatives
The first partner comes from the electronic goods manufacturer or relate or material supports for electronic products in Thailand.

The second partner comes from automotive industrial; this partner has the potential to negotiate with 2nd or 3rd tier in term of raw material.
Both alternatives will need to invest money and operate in the land of the main company owned.

Alternative 1.2 Joint venture investment by electronic goods partner

Table 11 Alternative 1.2 SWOT

Strength	the partner has a closed relationship to access to the industrial
	stronger negotiation with the supplier
weakness	partner can access to current information and supplier of company
	the variety of product can gain difficulty to manage and stock
opportunity	access to electronic goods market supply chain
	get the information through upstream raw material from supplier
Threat	the market barrier that mostly Japanese culture problem
	the main company doesn't have experience in the market

According to table 10, the detail of each element can be defined as followed;

Strength: the strength obtained by the partner has closed relationship to the industrial firm specifically which can easily meet the customer requirement very quickly and effectively. Another strong point is with partnership in the industrial of electronic goods, the raw material will use the same as PPGI (pre painted galvanized iron) which can use in the construction material as well. However, based on the gap in quality different the right supplier will be very important to focus.

Weakness: weakness of joint venture method is normally based on the secret information of both partners, based on the situation both can access through the supply chain upstream resources to take advantages both market segment. Another weakness is electronic goods have a lot of variety in both color and sizing of products.

Opportunity: expanding the company to be in electronic goods supply chain is not only the slitting line process but also include other process, such as roll forming and punching. Another opportunity is also the weakness of partnership is access through the supply chain stream of high quality raw material for electronic goods.

Threat: Thailand's electronic goods markets mostly are Japanese and Korea brand both countries' culture is specified in unique and difficult to get in the supply stream. Another problem is main company lacks of experienced in the market which lead to get fooled by the complexity of negotiation and pricing of new market.
From the SWOT analysis to create the strategy, TOWS matrix is a tool that easy to construct.

Table 12 Alternative 1.2 TOWS matrix

TOWS matrix		O	T
		access to electronic goods market supply chain	the market barrier that mostly Japanese culture problem
		get the information through upstream raw material from supplier	the main company doesn't have experience in the market
S	the partner has a closed relationship to access to the industrial	SO: This alternative will use the demand in the market to access through new suppliers and use the quantity to gain more negotiation power for get a lower material cost.	ST: The main company can overcome by using the experience in construction business to take on the pricing strategy
	stronger negotiation with the supplier		

W	partner can access to current information and supplier of company	WO: using the both information from partner and main company to cover the problem of variety material	WT: try to use the fix contract on negotiation both variety of material and pricing in long-term to control the variation.
	the variety of product can gain difficulty to manage and stock		

TOWS matrix shows the strategy that will obtain by partnership with the partner who specialized in electronic industries. These strategies will create the resources to use in resources based view analysis (VRIO) to get the sustainable development.

TOWS matrix assumption

On the March 9th 2016, two parties have been organized to operate on strategic decision making with current electronic goods partner. The result on two assumption of 1.2 and 2.2 was picked according to SO (Strength – opportunity) and WO (Weakness- opportunity) respectively.

Alternative 1.2 VRIO analysis

Tangible resources: land, location, distribution channel (branches)

Intangible resources: partner, new market access channel, main company R&D resources, both company supply chain information and bargaining power to the supplier.

Value: the resources that valued most in this scenario is totally different from scenario 2 since the value will focus on the partner, skill and channel to expand of company. Rare resources will be mostly intangible which relationship of partner is.

Rare: A rare resource which cannot find from other companies is R&D potential of the main company to meet the requirement of customer and relationship with the government in research facilities to gain fast move for new customer market.

Costly to imitate: the resources that costly to imitate in this alternative are the distribution channel and main company R&D resources since both resources not only need to budget for investment but also time is needed to get more experienced in the field business.

Organized to capture the value: The investment main purpose is to reduce cost of the main company, however gaining the income is one of the methods to reduce the cost in the end, these resources was contributed to organized to capture the value by R&D, partnership relationship, new market access, bargaining power to the supplier.

Conclusion

To develop the company according to VRIO analysis based on strategy from TOWS matrix in this alternative is focusing on the relationship between main company and partner throughout market access of electronic goods. Furthermore bargaining in negotiation of raw material from the supplier had made the company gain cheaper in the market of raw material.

Alternative 1.3 Joint venture investment by automotive goods partner

Table 13 Alternative 1.3 SWOT

Strength	automotive is one of Thailand's biggest market segment
	new material supply chain in the industries
weakness	doing "just in time" process push the pressure to the supply stream
	Long term negotiation contract.
opportunity	New coming investment project.
	the trend of market growth

Threat	cost competitive compare with other countries
	change of new technology

Strength: Based on Thailand's GDP, automotive is accounted approximately from 2-4.5% in exported value of GDP. This is a very big market to get in to. To be precise most of automotive parts are required the material in aluminum or galvanized steel which is a related filed of supply chain from the main company. However, using these materials still needs the same process which is slitting.

Weakness: Doing just in time policy was introduce by TOYOTA in Thailand, however most of automobile company in Thailand try to achieve the same principles, this reason push the pressure to all the supply chain. Another weakness is long term contract of supply, due to the risk management of main company in automotive industry, pricing and timing will be controlled by the customer.

Opportunity: According to K. Bank research (August 2015), the demand in Thailand is expected to grow from the number of new car register reported increased every year. Not only the number of new car registered but also the number of accident in Thailand still remains high constantly. Another factor is the investment from the foreigner, according to the report from 2012-2015, Japanese put the direct investment to Thailand the most among ASEAN community which reach to 150 project (counted 263 billion THB).

Threat: The price war is very difficult to beat in term of product, however the process of slitting still affected by the total cost of production. Another one is change in technology, based on the current growth of model in electricity, hybrid will affect to the total parts of car generator power. Based on evaluation of SWOT analysis, creating TOWS matrix to define the strategy goal of cooperation is the must.

Table 14 Alternative 1.3 TOWS matrix

TOWS matrix		O New coming investment project. the trend of market growth	T cost competitive compare with other countries change of new technology
S	automotive is one of Thailand's biggest market segment	SO: using the market size that partner specialized in to get more customers in each tiers of supply chain and offer the variation of product from the main company.	ST: by getting more access channel to the raw material supply chain will take advantage on change of new technology.
	new material supply chain in the industries		
W	doing "just in time" process push the pressure to the supply stream	WO: the number and variation of product in automotive manufacturer can allocate the resources and raw material cost freely.	WT: can be minimized by using just in time principle on this cooperation investment.
	new material stock and sunk cost		

According to table 13 TOWS matrix, the strategy represents in new market backward to upstream which is completely new material for the company. However, based on the market size is very attract company to be one of new coming player in the market. The resources that get from applied strategy can be perspective as followed for resources based view analysis VRIO

TOWS matrix assumption

The strategy was picked by considering from interview with the expected partner and owner of Viriyalohakij during the discussion for analysis, the answer were both ST (Strength-Threat) for the first priority both alternative 1.3 and 2.3 respectively.

Alternative 1.3 VRIO analysis

Tangible: land, location, distribution channel (branches)

Intangible: raw material access channel, automotive parts and vehicle alliance, the production technique and connection with standard inspector, R&D of main company.

Value: All intangible are valued resources especially the relationship and alliance for the industry cluster. Also, the information and connection to improve the business is valuable as well.

Rare: the resources that rare are both tangible and intangible, due to the location and land is non-substitutable for the investment project is tangible, the intangible rare resource is the production technique that can be used in main company.

Costly to imitate: resources that are costly and difficulty to be measured are mostly intangible resources such as the connection of partner, new supply chain stream access. However costly that can be measured such as land and distribution channel of main company can also be considered as the resources costly to imitate.

Organized to capture the value: the resources concern on the organization that had been operate the resource to capture the value are R&D of the main company to keep satisfy the customer expectation, another resource is production technique and alliance which can support with the main company R&D and strategy.

SCENARIO 2

Alternative 2.1 the investment contributes by using the land of industrial zone

This alternative was coming from the idea to establish completely new business sector outside of the main company and targeting on the customer in the industrial area zone.

Table 15 Alternative 2.1 SWOT

Strength	The project will gain funding support from government in the initial process
	the local firm support both resources in labor and material
weakness	costly to imitate on the land and long administrative process
	difficulty in communication and get supported from main company
opportunity	new customer in area
	easy access to local customer capacity
Threat	the limited of land and pricing
	the policy and standard control that annually checked

Strength: the project will get funding from the government in the initial process was defined by BOI (board of investment of Thailand) and I-EA-T (industrial estate authority of Thailand) announced that those who invest in the specific area will gain tax privilege and special vat of import and export. Another strong point of this alternative is gaining support from the zone policy in labor policy and outsourcing company in local firm.

Weakness: to get in to the industrial zone there is a cost needed to invest, such as the document process fee, inspection and the land cost in the area is much more expensive than outside area.

Opportunity: since the project was invested in the industrial zone area, the new customer in local firm will be the best opportunity to access through. The amount of

local firm can get cover all the capacity and able to expand expected production capacity.

Threat: The lands in some industrial area are already full and the possible customer of this project is limited to electric, construction and car enterprise.
To sum up, the SWOT analysis shows the potential of project alternative case. This can lead to expand more in the future; however, to create the strategy of this alternative the TOWS matrix also need to be analyzed.

Table 16 Alternative 2.1 TOWS matrix

<table>
<tr><td colspan="2" rowspan="3">TOWS matrix</td><td>O</td><td>T</td></tr>
<tr><td>new customer in area</td><td>the limited of land and pricing</td></tr>
<tr><td>easy access to local customer capacity</td><td>the policy and standard control that annually checked</td></tr>
<tr><td rowspan="2">S</td><td>The project will gain funding support from government in the initial process</td><td rowspan="2">SO: the project will able to access to a lot customer in local firm and using the support policy from BOI and I-EA-T to reduce cost for gain more customers from outside the industrial zone.</td><td rowspan="2">ST: based on the support from the policy, the land pricing can be calculated in tax policy to overcome the initial investment cost.</td></tr>
<tr><td>the local firm support both resources in labor and material</td></tr>
<tr><td>W</td><td>costly to imitate on the land and long administrative process</td><td>WO: using the coming opportunity to get closed relationship to the local firm company and pick the addition investment for this</td><td>WT: get more customer on the local for main company to reduce the problem of distance relationship</td></tr>
</table>

	difficulty in communication and get supported from main company	project.	

According to the TOWS matrix (Table 15), the strategies can perspective by SO, ST, WO and TT from matrix to create resources as followed;

TOWS matrix summary

In alternative 2.1, The director of Viriyalohakij was decide to pick WO strategy in order to achieve the potential of cluster management and expand network to catch up the coming opportunity.

Alternative 2.1 VRIO analysis

Tangible resources: land, machine process.

Intangible resources: standard inspection, closed relationship with local firm, labour resources access and flexibility, policy supported.

Value: the resources that valued in this investment will represents as land, closed relationship with local firm and policy supported. Since these resources are value much more and possible to grow in the future.

Rare: rare resource in perspective of the project will be illustrated on intangible resources which are policy supported and closed relationship to the local firm.

Costly to imitate: based on the project the most costly to imitate in this project is land price in the industrial zone is very costly, however not only the value measureable resources, some that doesn't measureable resources must be the access channel through the local firm which are new customer for both main company and the project itself.

Organized to capture value: The resources that the business model uses for organised to capture the value are local firm relationship and policy support. Based on the value that project shows performance in expanding the business to the local area these resources are organized to capture the value of income.

Conclusion

The VRIO analysis of this alternative represents mostly local based advantages and the supported policy by the government. However, based on the land price and the administrative cost to gain by inspection policy of industrial zone, the high costly both annual and initial will need to be calculated on financial analysis

Alternative 2.2 Joint venture investment by electronic goods partner

To create strategy according to the condition, the SWOT analysis would be applied.

Table 17 Alternative 2.2 SWOT

Strength	Gain more efficiency in sales and marketing based on cluster
	Network through the cluster with new customer in many market categories
weakness	the joint venture need time on decision making process
	Cost of operation and overhead.
opportunity	supported from the local firm policy and government firm
	fast flow of business in the area
Threat	current new anti-dumping policy applied on coming current material segment
	the market is easy access for competitor

Strength: Based on the joint venture model, partner will also gain advantage to do some sales and marketing in the local area which is industrial zone. However, in this research the scope was set on specific area which more advantages on main company than others. However, based on location in area there are no competitor at the moment and some of electronic manufacturer already existed in the area. Another strength point is new customer access through the location, according to the

company list in the industrial zone; there are some businesses that possible to cooperate with the company such as steel coating, mould producer.
Weakness: Based on the business model of joint venture, the decision process will need to agree with both parties in the major decision which make some process slower than other one completed owned management. Another weakness is based on the cluster environment the competitive in wages; salary on labour cost will be very competitive.

Opportunity: gain support from local firm which one stop service in administrative and management is very easy to fast start the business. Another good point in this area is the flow of business in the area. Based on the number of company in the area, not only the company's that located in the industrial zone but also the company those need to cooperate with new company.

Threat: the current anti-dumping imported material PPGI was applied on Vietnam on August 2016, as mentioned before the policy was announced against china in 2012. The second threat is the competitor, since the initial investment is not big amount of spending, this process is very easy to access to the market.

By using SWOT analysis, the case can create TOWS matrix to set the initial strategy and direction of joint venture road map

Table 18 Alternative 2.2 TOWS matrix

TOWS matrix		O	T
		supported from the local firm policy and government firm	current new anti-dumping policy applied on coming current material segment
		fast flow of business in the area	the market is easy access for competitors
S	Gain more efficiency in sales and marketing based	SO: gaining more efficiency to access	ST: based on supported policy and partner's

	on cluster	new local cluster customer along with supported from local and government firm policy made the company gain advantages more in price war and lead time production.	connection made company overcome the new non partnership competitors.
	Network through the cluster with new customer in many market categories		
W	the joint venture need time on decision making process	WO: using outsourcing to gain the faster flow of process and some uncontrollable cost by alliance with local firm.	WT: reduce processing time and create barrier for new coming competitors by making the long term contract with the customer.

TOWS matrix (Table 17) shows the strategy to create resources according to SO: the resources from this investment will come out on process efficiency, networking, support policy WO: by contact with the local firm form alliances in transportation to overcome uncontrollable cost.

Tangible: land, factory, machine line, office system, location

Intangible: bargaining power to supplier, local area in the industrial zone, outsourcing resources, business flow and resources support, main company experienced , partner specialize.

Alternative 2.2 VRIO analysis

Value: The resources put valued added on are land, building and location, bargaining power, area business flow and neighbour companies. These all resources can be valued by specific investment in the area which is the aiming of this case.

Rare: Rare resources in this case are location, partner specializes and main company experienced are rare resources in this investment.
Costly to imitate: the resources that are costly to imitate and difficulty to be substituted still under circumstance of tangible which are land, building. However the most undeterminable of cost is the partner.

Organised to capture the value: based on the company's strategy, the resources that suit to this condition is the local area industrial zone efficiency (company, policy and flow of business)

Conclusion

By doing joint venture business model on the land located in the industrial zone will exploited the resources of both main company and partner's to be more efficacies in production, production and transportation. This basis has the potential to support the main company goals and objectives.

Alternative 2.3 Joint venture investment by automotive goods partner

The SWOT analysis still has some overlap in the same perspective of view by the main company on investment, however the different in market and partner shows some significant different in strength, weakness, opportunity and threat along with market size and environment.

Table 19 Alternative 2.3 SWOT

Strength	Gain more efficiency in sales and marketing based on cluster
	Various type of raw material offer to the cluster
weakness	the joint venture need time on decision making process
	product life cycle and complexity
opportunity	New coming investment project
	the trend of market growth
Threat	cost competitive compare with other countries
	change of new technology

Strength: Mostly in each industrial area in central of Thailand are consists of many automotive parts manufacturer. This made to joint with automotive partner gain advantages and more efficiency than main company alone on investment. Another good point to invest advantage to the project is gaining access back through the supply chain by partner's relationship. This make more resources access gains to the company.

Weakness: as every joint venture model business, making decision will take time on process; another weakness for this focus customer model is product. The product life cycle need to be changed according to customer.

Opportunity: According to K. Bank research (August 2015), the demand in Thailand is expected to grow from the number of new car register reported increased every year. Not only the number of new car registered but also the number of accident in Thailand still remains high constantly. Another factor is the investment from the foreigner, according to the report from 2012-2015, Japanese put the direct investment to Thailand the most among ASEAN community which reach to 150 project (counted 263 billion THB).

Threat: The price war is very difficult to beat in term of product, however the process of slitting still affected by the total cost of production. Another one is change in technology, based on the current growth of model in electricity, hybrid will affect to the total parts of car generator power.

The SWOT analysis shows the potential of project in both by the perspective from investment and from outside perspective to the company. By using the information from SWOT analysis, TOWS matrix can be crated for strategy as followed;

Table 20 Alternative 2.3 TOWS matrix

TOWS matrix	O	T
	New coming investment	cost competitive compare with other

		project	countries
		the trend of market growth	change of new technology
S	Gain more efficiency in sales and marketing based on cluster.	SO: use partner's connection to access new customer and maximize the capacity of expected demand.	ST: Using locations based do the pricing in transportation to customer and get supported by company in raw material.
	Various type of raw material offer to the cluster.		
W	the joint venture need time on decision making process.	WO: using the demand and number of customer to get over product life cycle problems and make an agreement on decision making process for both parties.	WT: minimize uncertainty of product cycle and complexity by carefully select technology of product production.
	Product life cycle and complexity.		

TOWS matrix shows strategy to create the resources as followed to be used in VRIO analysis the author divide to tangible and intangible resources as followed;
Tangible: land in the industrial zone, company raw material and partners, machine process.
Intangible: Knowledge and experience in the machine, new raw material demand and access channel, partner skills, R&D of main company.

Alternative 2.3 VRIO analysis

Value: The resources that value for project itself is the land, partner's skill and new material access channel. These resources can support both main company and project investment capability.

Rare: Rare resources mostly come from intangible especially experienced in machine process and R&D from the main company that can support overcome many threats in the market.

Costly to imitate: resources that costly to imitate are all undeterminable in value of money, R&D of main company, partner's skill, knowledge and experience in machine process.

Organized to capture value: The resource that was organized to capture the value from this investment is the ability to access through supply steam on raw material. The next resource is the capability to access to the new market. Another resource is R&D of main company will be developed for capture the new value of customer.

Conclusion

The joint venture model invest on the industrial zone by partner with automotive partner will gain advantage physically by the land and association with the local firm. However, many resources that can be used in sustainable development by VRIO

analysis guide the company to the new access of raw material supply stream and new market access which is automotive parts.

Financial calculation components

According to analysis, the component of investment in term of money is as followed;

1. Space and area requirement: in this research the investment project will use a warehouse which owned by company in 800 square meters. With office area and fully facilities occupied.

2. Direct labour cost: in this investment project, 5 staffs are required for machine operation 1 staff for factory manager and 1 staff for administration and account.

3. Slitting machine line process: which has the specification as followed;

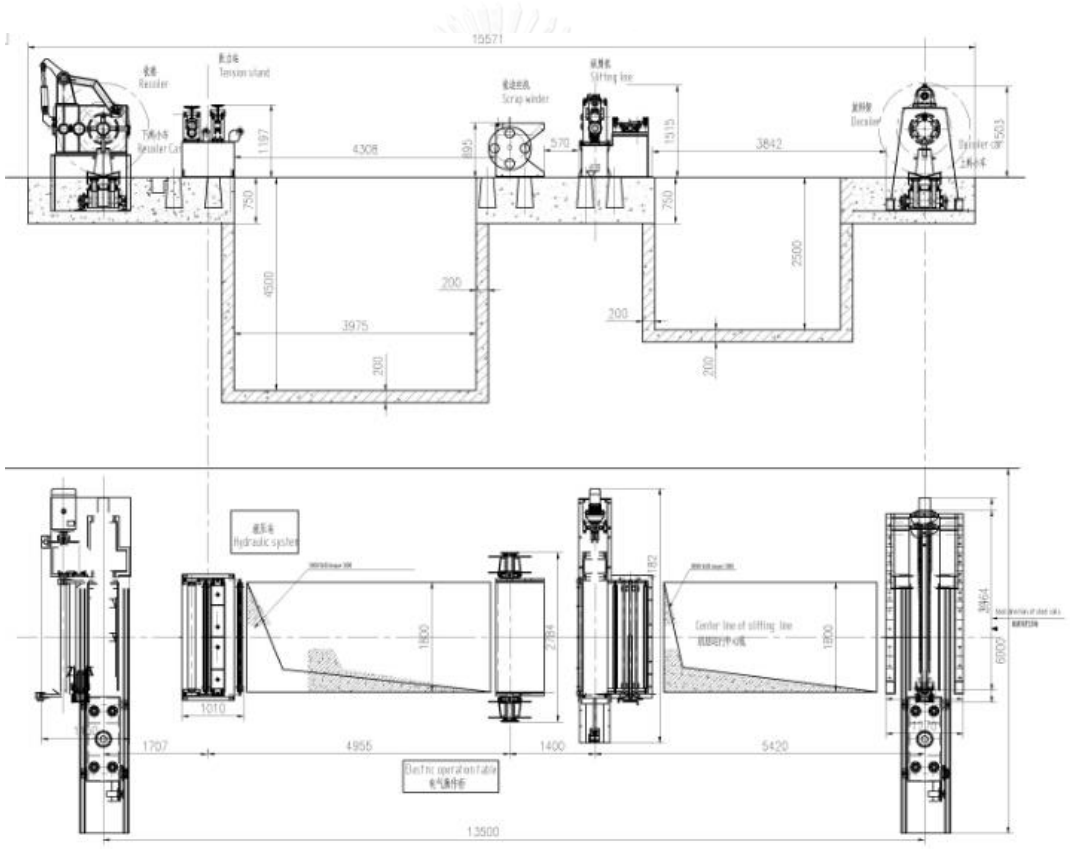


Figure 22 Slitting line process layout

The figure shows the machine lay out for all of the station in slitting line process which consists of the width and length, according to the size of the line process, space required for 200 square meters. But not only the space of machine, the steels

coils that need to be used as raw material and the end product all need the space. The author suggests using 400 square meters for stocking and operating the machine.

Slitting line machine specification:

Technical parameters

Applied to various steel plate 450Mpa;

Thickness of coil plate ： 0.2-1.5mm

Width of coil plate ： 1524mm

Slitting width tolerance ： ±0.05mm

Slitting speed ： 0-50m/min

Loading capacity ： 8T

Coil I.D ： 508mm

Coil O.D ： 1200mm

Knife pivot diameter of slitting ： 120mm;

Slitting blade ： 120x220x10; 10 pcs

Power: 380V three-phase electricity: 50Hz;

Regard to the machine specification, the production capacity of the process line is approximately (using 0.4mm steel sheet thickness as the standard) is around 0.32kg/meter. The specification also show how each batch production can be possibly to manage.

The total capacity production is about 15MT/day or 460MT/month (2 working period which assume as 16hours a day). However VIRIYALOHAKIJ company only use for 200MT/month, hence that the 260MT capacity that still left will be used for the business and 2scenario will be described in term if financial detail.

The author will use 2 cases in each scenario which are worst case and normal case. The different between there 2 cases are according to the table as followed (Table 20);

Table 21 Detail of difference in two assumptions.

Factors	Worst case	Normal case
Revenue from Viriyalohakij	60-80%(1.08 – 1.44 Million THB)	80 -100%(1.44 -1.8 Million THB)
Service fee of business	Range from 0.85-1THB/Kg	Fixed at 1THB/Kg
Revenue from service fee of new business	Range from 28%-100%(75-260 MT)	Range from 48%-100%(125-260MT)
Direct labor and cost of service	35-91% of cash receipt.	33-91% of cash receipt.

The pricing of slitting service was set on 0.8-1 THB/KG according to company's current supplier pricing. For the company will use 1THB/KG as the calculation and price strategy.

4.2 RESULT & ANALYSIS

VRIO result

To sum up the entire scenario according to analysis, the table will represents each of scenario resource based view based on VRIO tool.

Table 22 all alternative VRIO

VRIO	Resources scenario cases
V: Value	1.1:brand image, R&D, location
	1.2: land, partner skill industries
	1.3: connection with new market segment(access)
	2.1:land, location(distance)
	2.2: land, building, bargaining power
	2.3: land, new material access resources information
R: Rare	1.1: Operation services(new product category), location
	1.2: main company R&D support
	1.3: land , production skill and technique
	2.1: supported policy from both micro and macro perspective.
	2.2: partner and main company experiences specialty
	2.3: R&D of main company, machine field experienced
I: Costly to imitate	1.1: land and machine
	1.2: distribution channel and R&D
	1.3: material supply, main company distribution channel
	2.1: land, local firm support in operation
	2.2: land, building partner skill
	2.3: R&D, partner's skill, knowledge and experience in machine process.
O: organized to capture value	1.1: cost effective, machine process, company branding
	1.2: bargaining power to the supplier
	1.3: R&D, production technique, new supply stream access.
	2.1: new cluster area access, international standard
	2.2: land, supported policy from government

	2.3: ability to access new market and new raw material supply steam

The table 22 shows VRIO analysis based on 2 scenarios with sub alternatives, according to the analysis the most value resources are focusing on land ,brand value, R&D and partnership when it comes to investment, however if no investment the value will be put on other strategies to focus on the right spending. While rare resources represent the main company potential to support the investment in R&D and IT management system. However in some alternative land and location still rare resources. The resources that costly to imitate is no doubt but land and machine for tangible, for intangible resources, mostly focus on the relationship, R&D supported from main company and distribution channel from main company. The last criteria from analysis which is the question that resources was organized to captured value, based on all scenario and alternatives sticking to the current supplier will organized to get company flexibility as a resource. In the other hand, investment scenario either joint venture strategy or direct invest resources are more intangible such as cost effective, bargaining power to the supplier and new supply chain of raw material access.

Financial result

Scenario 1 Investment on company's owned land

By using SCB MLR: 0.06275 as the interest rate in calculation, inflation rate= 2.5 %, 5years period calculation

1.1 Company direct investment on company's owned land.

The company can gain complete management in both alternatives; however both of them have completely different in strategic of operation and money investment. To be more precise first alternative a) Invest on company's owned land and properties can be calculated as followed;

Table 23 Alternative 1.1 Financial result

initial investment		NPV	IRR	ROI based on 5Y NPV
5,543,000.00	scenario 1.1: Use company's owned land			
	worst case	฿675,269.68	9.81%	12%
	normal case	฿6,280,007.05	35.28%	113%

The table shows the amount of initial investment based on each element according to both worst and normal case. This show the possibility of investment in alternative

1.2 Joint venture business model with Electronic good product partner.

Table 24 Alternative 1.2 Financial result

initial investment		NPV	IRR	ROI based on 5Y NPV
3,043,650.00	scenario 1.2: partnership(electronic goods)			
	worst case	฿1,264,525.46	19.4%	42%
	normal case	฿2,685,310.37	31.6%	88%

By joint venture with a partner gain lover in NPV total of investment compare with the first alternative. However based on the amount of investment, IRR and ROI show the higher percentage in worst case. This leads to the lower risk.

1.3 Joint venture business model with Automotive good product partner.

Table 25 Alternative 1.3 Financial result

initial investment		NPV	IRR	ROI based on 5Y NPV
3,148,650.00	scenario 1.3: partnership(automotive)			
	worst case	฿222,467.19	8.7%	7%
	normal case	฿1,782,047.26	24.4%	57%

This table reflects the same result as alternative 1.2, however based on the initial investment of company. The return cannot get higher than electronic goods product and even make the lowest ROI value.

Conclusion

All alternative have potential to investment, however to pick the best alternative focusing on ROI is the best factor to be picked. In this scenario, the best ratio is alternative 1.1 which returns most on both worst and normal case.

Scenario 2: Investment in the industrial zone

Using the construction price from Thai appraisal foundation as references, and the land price using the average the standard pricing from Industrial Estate Authority of Thailand by specific on NongKhae industrial zone since this location located between the main company and Bangkok port (Klongtoey). The advantage by investing in the industrial zone will include with tax privilege for 7 years and free import duty on machine.

The labor cost in the industrial zone will be more than outside industrial zone based on competitive in number of company on the same area. The number of company in the industrial zone was categorized into automotive for 5 companies and electronic goods for 3 companies.

The land price is 2.5 Million THB/ 1rai (1600sqm.) in this alternative, the author assumes that company will have to use 3200sqm for

Warehouse area is 1000 square meter which construction cost is 7400THB/square meters by Thai appraisal. Each calculation will be based on 5 years and the last year will need to sale land, machine and building back for get the calculation. Using depreciation in straight line calculation for building (20 years) machine (5years) and land price will be sold at 3.5Million THB in the 5th year.

2.1 Company direct investment in the industrial area

This alternative will get a lot more income during the location supported for investment and closed relationship with all customers in area. The scenario will calculated on the point of view that the return on investment of partner will be cash on owner's withdrawal from profit sharing each year.

The cost will be added to this scenario is rental space from the VIRIYALOHAKIJ company since the ownership the rental cost of warehouse will be charged in calculation. Come out with this results

By using SCB MLR: 0.06275 as the interest rate in calculation, inflation rate= 2.5 %, 5years period calculation

Table 26 Alternative 2.1 Financial result

initial investment		NPV	IRR	ROI based on 5Y NPV
17,160,400.00	scenario 2.1: Buy a new land in industrial zone			
	worst case	฿13,473,854.26	23.50%	79%
	normal case	฿22,134,411.07	33.43%	129%

2.2 Joint venture business model with Electronic good product partner (industrial area investment)

The land price is 2.5 Million THB/ 1rai (1600sqm.) in this alternative, the author assumes that company will have to use 3200sqm for

Warehouse area is 1000 square meter which construction cost is 7400THB/sq.m. By Thai appraisal. Each calculation will be based on 5 years and the last year will need to sale land, machine and building back for get the calculation. Using depreciation in straight line calculation for building (20 years) machine (5years) and land price will be sold at 3.5Million THB in the 5th year.

Sales capacity is the maximum simulate in this case by getting advantages from partner's skill and cluster on the area of investment.

Table 27 Alternative 2.2 Financial result

initial investment		NPV	IRR	ROI based on 5Y NPV
9,483,220.00	scenario 2.2: electronic goods partner(industrial zone)			
	worst case	฿4,013,454.51	16.79%	42%
	normal case	฿10,151,570.21	30.97%	107%

2.3 Joint venture business model with automotive good product partner (industrial area investment)

The land price is 2.5 Million THB/ 1rai (1600sqm.) in this alternative, the author assumes that company will have to use 3200sqm for

Warehouse area is 1000 square meter which construction cost is 7400THB/sqm by Thai appraisal. Each calculation will be based on 5 years and the last year will need to sale land, machine and building back for get the calculation. Using depreciation in straight line calculation for building (20 years) machine (5years) and land price will be sold at 3.5Million THB in the 5th year.

Sales capacity is the maximum simulate in this case by getting advantages from partner's skill and cluster on the area of investment.

Table 28 Alternative 2.3 Financial result

initial investment		NPV	IRR	ROI based on 5Y NPV
9,565,720.00	scenario 2.3: automotive partner(industrial zone)			
	worst case	฿7,893,917.57	25.34%	83%
	normal case	฿9,702,489.62	29.89%	101%

Conclusion

Each alternative shows significant number on return of investment, also include with NPV and IRR. The best ROI among 6 alternatives is founded in alternative 2.1 normal case situation, however the lowest risk of investment can be found in highest ROI of the worst case in alternative 2.3.

VRIO & Financial ANALYSIS

Resources based view (VRIO) comparison and conclusion

By using weight strategy, the author would weight from the resources that make other resources exposed their potential according to the principle of “resources based view” that standing for VIRIYALOHAKIJ’s VRIO analysis and operation strategy by “Hill framework” which are company strategies, goal mission and vision.
In this scoring table, the score will be +1 If the resources that VRIO can achieve company operation strategy (Hill’s framework).While gaining +1 if the resource can expand the resources in term of VRIO more than the initial resources which mentioned in phase I.

Hill’s framework scoring

Value: Each alternative value resources are conducted to achieve company's goal and mission statement by scored 1 point in all alternatives. However, alternative 2.1 is accounted for 0.5 point because of the potential of land and location distance is not fully cover the management term of Hill's framework. While other alternative

contains at least one management resources, such as partner skills, new market channels access.

Rare: Two rare resources from alternative 2.2 and 2.3 was focus based on the cluster of industrial zone which not much relate to Hill's framework of Viriyalohakij investment. The reason that alternative 2.2 get 0.5 scored on hills framework is because the experienced of partner and main company can achieve 2 mission statements which are flexibility production and achieve the international standard management. For 2.3, one more added to scoring point is become more accessible for local customer which is the main purpose for alternative 2.3 resources. That means alternative 2.3 can obtain 3 mission statement and 2.2 can get through 2 mission statement. This scored 0.5 and 0.75 respectively.

Costly to imitate: The resources that difficulty to imitate that has potential to achieve hill's framework completely are resources from alternative 1.1, 1.2 and 2.2 while alternative 1.3 resource can obtain only flexibility goal and local customer access that accounted for 0.5 on the score board. While 2.1 get more in the international standard management. In the other hand, alternative 2.3 got 0.75 score which serve 3 missions, flexibility goals, international standard and customer accessible channel.

Organised to capture value: The resources that difficulty to imitate that has potential to achieve hill's framework completely are resources from alternative 1.1, 1.2 and 2.2 while alternative 1.3 resource can obtain only flexibility goal and local customer access that accounted for 0.5 on the score board. While 2.1 get more in the international standard management. While 2.3 got 0.75 score which serve 3 missions, flexibility goals, international standard and channel access.

VRIO scoring

Value: The most value resources of Viriyalohaij investment is product range. Each alternative value resources can support the product range of Viriyalohakij investment. That's all alternative will accounted for 1 scored.

Rare: The rare resource of Viriyalohakij investment is the main company location. All alternative in scenario 2 which need to buy a new land in the industrial zone will not provide advantage to rare resource of the main company.

Costly to imitate: the resources that difficulty to be substituted or copy from perspective of investment in alternative 1.2 and 1.3 were not do the brand recognition since the model of business is joint venture. However, in the same model in 2.2 and 2.3 the resource use the local firm supports to made the brand recognition.

Organized to capture value: The resources from alternative 1.1, 1.2 and 2.3 show the potential on capability of R&D resources to capture value of the rest of resources in VRIO analysis that scored 1 respectively. However, alternative 1.3, 2.1 and 2.2 doesn't use R&D as the main resources of core competency development. These reflect to the scored of these alternatives to be 0.
Value resources, alternative 1.1 is scored as 1 point for hill framework based on the (Table 29);

Table 29 VRIO score board

VRIO	Alternative	Hill framework	RBV	total
V: Value	1.1	1	1	2
	1.2	1	1	2
	1.3	1	1	2
	2.1	0.5	1	1.5
	2.2	1	1	2

	2.3	1	1	2
R: Rare	1.1	1	1	2
	1.2	1	1	2
	1.3	1	1	2
	2.1	1	0	1
	2.2	0.5	0	0.5
	2.3	0.75	0	0.75
I: Costly to imitate	1.1	1	1	2
	1.2	1	0	1
	1.3	0.5	0	0.5
	2.1	0.5	1	1.5
	2.2	1	1	2
	2.3	0.75	1	1.75
O: organized to capture value	1.1	1	1	2
	1.2	0.75	1	1.75
	1.3	1	0	1
	2.1	1	0	1
	2.2	0.75	0	0.75
	2.3	1	1	2

According to the Hill's framework (operation strategy) the fitting of resources which able to achieve marketing strategy, company vision, mission goal statement and some of operation strategy in manufacturing was analyses in 3 scenario by scoring. While RBV of phase I show as the initial standard to compare with all scenarios for maintain or gaining more advantage resources potential.

Table 30 Alternative's VRIO score result

1.1	8
1.2	6.75
1.3	5.5
2.1	5
2.2	5.25
2.3	6.5

Conclusion

The score shows (Table 30) all scenario/alternative performance based on strategy and resources view which represents the best choice is alternative 1.1 to partnership with electronic goods partner on the land of company's owned. The reasons why this come out to fit most to both VRIO and Hill's framework is the investment explode the potential of company's resources which are R&D, land, branches to the most as other investment on the company's owned land. However what made this alternative step ahead other choices are the potential to gain advantage in hill's frame work on company's mission goals and vision which are increase the production capability to achieve company's goals in flexibility and market leadership, using branches to access to the new segment of customer.

However, not only the view of strategic analysis is used for decision making, the financial analysis will answer the possibility of investment through the number from ratio such as NPV, IRR and ROI will give the information that which scenario and alternative is the most possibly to invest in term of money.

Financial ratio comparison and conclusion

The financial analyses reflect the possibility of investment based on perspective of investor and bank loan interest. The alternative 2.1 had made the best financial outcomes. According to the element that use for the calculation all the number are closed to using in the reality investment perspective. The best financial terms come

up with doing joint venture with the right partnership. However from financial perspective, both joint venture strategies do a good of investment outcome.

Table 31 NPV, IRR, ROI based on 5Years NPV

initial investment		NPV	IRR	ROI based on 5Y NPV
5,543,000.00	scenario 1.1: Use company's owned land			
	worst case	฿675,269.68	9.81%	12%
	normal case	฿6,280,007.05	35.28%	113%
3,043,650.00	scenario 1.2: partnership(electronic goods)			
	worst case	฿1,264,525.46	19.4%	42%
	normal case	฿2,685,310.37	31.6%	88%
3,148,650.00	scenario 1.3: partnership(automotive)			
	worst case	฿222,467.19	8.7%	7%
	normal case	฿1,782,047.26	24.4%	57%
17,160,400.00	scenario 2.1: Buy a new land in industrial zone			
	worst case	฿13,473,854.26	23.50%	79%
	normal case	฿22,134,411.07	33.43%	129%
9,483,220.00	scenario 2.2: electronic goods partner(industrial zone)			
	worst case	฿4,013,454.51	16.79%	42%
	normal case	฿10,151,570.21	30.97%	107%
9,565,720.00	scenario 2.3: automotive partner(industrial zone)			
	worst case	฿7,893,917.57	25.34%	83%
	normal case	฿9,702,489.62	29.89%	101%

Results (Table31) show that there are several best financial ratio results; the best in NPV is alternative 2.1 which is completed owned investment in the industrial area from main company. While making the highest ratio of ROI and IRR on the worst case is alternative 2.3 which is joint venture investment with automotive partner on the industrial zone area.

Chapter 5
Result and Decision

Research result

According to Hill's framework analysis and VRIO of VIRIYALOHAKIJ company, had made the most suitable investment scenario on 1.1 to accomplish sustainable development on company's owned resources and get closed to company goals and mission statement strategy by invest on company's owned land and properties, this alternative can represents the outcome on exploding VRIO the best compare with others choices, However after scoring the outcome is a bit difference from author's expect.

During the financial calculation, since the possibility of income flow through the company is fixed according to main company production and machine capacity. The outcome of calculation was founded in 2 different perspectives. 1. Taking the lowest risk of investment by focusing on the worst, the alternative 1.3 will need to be picked. 2. Taking the highest return on investment alternative 2.1 will be selected. However, use the method by combining both RBV analysis and financial result.

By using the idea of RBV and Financial results, the top 3 ranking of RBV coming out with alternative 1.2, 1.1 and 2.3. In contrast, even alternative 1.2 and 1.1 gain positive in NPV and IRR but only 1.1 ROI is more than 100% which lead to the value is worth investing. However compare 1.1(2^{nd} raking) with alternative 2.3(3^{rd} ranking) the ratio of ROI is drastically different in worst case scenario.

Since the current situation of company and Thailand's economic is not stable as it should concern as normal case. The author decides to suggest alternative 2.3 to the company for making the decision of investment. This alternative can gain the amount of sales in the industrial zone customer, furthermore the automotive market has enough gaps to get through and growth along with market growth expected.

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APPENDIX

Appendix A

Scenario 1- Alternative 1: Investment on main company's owned land

WORST CASE

Alternative 1.1 yearly Cash Flow Projection(worst case)

VIRIYALOHAKIJ slitting line project (company's owned land) มิ.ย.-16		Capacity (MT) 75	Capacity (MT) 125	Capacity (MT) 175	Capacity (MT) 225	Capacity (MT) 235	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	5,543,000	100,000	282,630	910,556	1,553,325	2,304,265	
2. CASH RECEIPTS							
Company's Revenue		900,000	1,350,000	2,100,000	2,295,000	2,820,000	9,465,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	-	1,080,000	1,440,000	1,080,000	1,440,000	1,080,000	6,120,000
3. TOTAL CASH RECEIPTS	-	2,080,000	2,890,000	3,280,000	3,835,000	4,000,000	16,085,000
4. TOTAL CASH AVAILABLE	5,543,000	2,180,000	3,172,630	4,190,556	5,388,325	6,304,265	
5. CASH PAID OUT							
Purchases (Machine)	3,170,000	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,260,000	882,000	1,008,000	1,029,000	1,080,450	1,134,473	5,133,923
Payroll Expenses (Taxes, etc.)	126,000	88,200	100,800	102,900	108,045	113,447	513,392
Outside Services	-	-	-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000

Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	630,000	540,000	540,000	540,000	594,000	594,000	2,808,000
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	145,170	351,275	793,331	1,129,565	1,409,668	3,829,009
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	5,443,000	1,897,370	2,262,075	2,637,231	3,084,060	3,473,588	13,354,323
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	-	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	-	-	-	-	-	-
6. TOTAL CASH PAID OUT	5,443,000	1,897,37	2,262,07	2,637,23	3,084,06	3,473,58	13,354,3

		0	5	1	0	8	23
7. CASH POSITION	100,000	282,630	910,556	1,553,325	2,304,265	2,830,677	

NORMAL CASE

Alternative 1.1 yearly Cash Flow Projection(normal case)

VIRIYALOHAKIJ slitting line project (company's owned land)		Capacity(MT)	Capacity(MT)	Capacity(MT)	Capacity(MT)	Capacity(MT)	
มิ.ย.-16		125	175	225	225	260	
	Y0	Y1	Y2	Y3	Y4	Y5	**TOTAL**
CASH ON HAND [Beginning of year]	5,543,000	100,000	980,820	2,400,393	3,265,563	4,026,041	
2. CASH RECEIPTS							
Company's Revenue		1,500,000	2,100,000	2,700,000	2,700,000	3,120,000	12,120,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	-	1,440,000	1,800,000	1,440,000	1,800,000	1,440,000	7,920,000
3. TOTAL CASH RECEIPTS	-	3,040,000	4,000,000	4,240,000	4,600,000	4,660,000	20,540,000
4. TOTAL CASH AVAILABLE	5,543,000	3,140,000	4,980,820	6,640,393	7,865,563	8,686,041	
5. CASH PAID OUT							
Purchases (Machine)	3,170,000	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,260,000	1,008,000	1,058,400	1,310,400	1,375,920	1,444,716	6,197,436
Payroll Expenses (Taxes, etc.)	126,000	100,800	105,840	131,040	137,592	144,472	619,744
Outside Services	-	-	-	-	-	-	-

Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	630,000	540,000	540,000	540,000	594,000	594,000	2,808,000
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	268,380	614,187	1,221,390	1,560,010	1,817,770	5,481,737
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	5,443,000	2,159,180	2,580,427	3,374,830	3,839,522	4,222,958	16,176,917
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	-	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	-	-	-	-	-	-

6. TOTAL CASH PAID OUT	5,443,000	2,159,180	2,580,427	3,374,830	3,839,522	4,222,958	16,176,917
7. CASH POSITION	100,000	980,820	2,400,393	3,265,563	4,026,041	4,463,083	

Scenario 1- Alternative 2: Joint venture with electronic goods partner

WORST CASE

Scenario1.2 yearly Cash Flow Projection(worst case)

VIRIYALOHAKIJ joint venture with electronic goods partner มิ.ย.-16		Sales (MT) 100	Sales (MT) 150	Sales (MT) 175	Sales (MT) 175	Sales (MT) 250	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	3,043,650	100,000	613,344	932,253	1,185,423	1,165,012	
2. CASH RECEIPTS							
Company's Revenue		1,200,000	1,620,000	2,100,000	1,785,000	3,000,000	9,705,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	2,499,350	1,101,600	1,468,800	1,101,600	1,468,800	1,101,600	6,242,400
3. TOTAL CASH RECEIPTS	2,499,350	2,401,600	3,188,800	3,301,600	3,353,800	4,201,600	16,447,400
4. TOTAL CASH AVAILABLE	5,543,000	2,501,600	3,802,144	4,233,853	4,539,223	5,366,612	
5. CASH PAID OUT							
Purchases (Machine)	3,170,000	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,260,000	882,000	1,008,000	1,029,000	1,080,450	1,134,473	5,133,923
Payroll Expenses (Taxes, etc.)	126,000	88,200	100,800	102,900	108,045	113,447	513,392
Outside Services			-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal							

	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	630,000	540,000	540,000	540,000	594,000	594,000	2,808,000
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	112,410	287,248	325,548	551,978	721,442	1,998,626
Interest	-			-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	5,443,000	1,864,610	2,198,048	2,169,448	2,506,473	2,785,362	11,523,941
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	-	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	23,646	671,843	878,982.00	867,738	1,111,563	3,553,772
6. TOTAL CASH PAID OUT	5,443,000	1,888,256	2,869,891	3,048,430	3,374,211	3,896,925	15,077,713
7. CASH POSITION	100,000	613,344	932,253	1,185,423	1,165,012	1,469,687	

NORMAL CASE

Scenario1.2 yearly Cash Flow Projection(normal case)

VIRIYALOHAKIJ joint venture with electronic goods partner มิ.ย.-16		Sales (MT) 150	Sales (MT) 175	Sales (MT) 225	Sales (MT) 260	Sales (MT) 260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	3,093,650	100,000	774,402	1,319,874	1,374,518	2,250,001	
2. CASH RECEIPTS							
Company's Revenue		1,800,000	2,100,000	2,700,000	3,120,000	3,120,000	12,840,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	2,449,350	1,468,800	1,836,000	1,468,800	1,836,000	1,468,800	8,078,400
3. TOTAL CASH RECEIPTS	2,449,350	3,368,800	4,036,000	4,268,800	5,056,000	4,688,800	21,418,400
4. TOTAL CASH AVAILABLE	5,543,000	3,468,800	4,810,402	5,588,674	6,430,518	6,938,801	
5. CASH PAID OUT							
Purchases (Machine)	3,170,000	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,260,000	1,008,000	1,058,400	1,310,400	1,375,920	1,444,716	6,197,436
Payroll Expenses (Taxes, etc.)	126,000	100,800	105,840	131,040	137,592	144,472	619,744
Outside Services	-	-	-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal							

	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	630,000	540,000	540,000	540,000	594,000	594,000	2,808,000
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	240,450	514,846	1,006,564	130,550	1,791,162	3,683,572
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	5,443,000	2,131,250	2,481,086	3,160,004	2,410,062	4,196,350	14,378,751
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	-	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	563,148	1,009,442	1,054,152.00	1,770,455	1,195,353	5,592,550
6. TOTAL CASH PAID OUT	5,443,000	2,694,398	3,490,528	4,214,156	4,180,517	5,391,703	19,971,301
7. CASH POSITION	100,000	774,402	1,319,874	1,374,518	2,250,001	1,547,099	

Scenario 1- Alternative 3: Joint venture with automotive partner (main company's land)

WORST CASE

Scenario1.3 yearly Cash Flow Projection(worst case)
VIRIYALOHAKIJ joint venture with automotive goods partner
มิ.ย.-16

		Capacity (MT)	Capacity(MT)	Capacity (MT)	Capacity (MT)	Capacity (MT)	
		105	155	175	180	250	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	3,148,650	100,000	394,921	801,340	924,809	899,482	
2. CASH RECEIPTS							
Company's Revenue		1,260,000	1,674,000	2,100,000	1,836,000	3,000,000	9,870,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	2,494,350	1,080,000	1,440,000	1,080,000	1,440,000	1,080,000	6,120,000
3. TOTAL CASH RECEIPTS	2,494,350	2,440,000	3,214,000	3,280,000	3,376,000	4,180,000	16,490,000
4. TOTAL CASH AVAILABLE	5,643,000	2,540,000	3,608,921	4,081,340	4,300,809	5,079,482	
5. CASH PAID OUT							
Purchases (Machine)	3,170,000	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,260,000	882,000	1,008,000	1,029,000	1,080,450	1,134,473	5,133,923
Payroll Expenses (Taxes, etc.)	126,000	88,200	100,800	102,900	108,045	113,447	513,392
Outside Services	100,000	50,000	50,000	50,000	50,000	50,000	250,000
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance							

	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	630,000	540,000	540,000	540,000	594,000	594,000	2,808,000
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	110,670	282,050	596,876	751,802	1,014,658	2,756,055
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	5,543,000	1,912,870	2,242,850	2,490,776	2,756,297	3,128,577	12,531,370
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	-	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	232,209	564,732	665,754.00	645,031	827,907	2,935,633
6. TOTAL CASH PAID OUT	5,543,00	2,145,07	2,807,58	3,156,53	3,401,32	3,956,48	15,467,

	0	9	2	0	8	4	003
7. CASH POSITION	100,000	394,921	801,340	924,809	899,482	1,122,997	

NORMAL CASE

Scenario1.3 yearly Cash Flow Projection(normal ase)

VIRIYALOHAKIJ joint venture with automotive goods partner

มิ.ย.-16

		Capacity (MT)	Capacity (MT)	Capacity(MT)	Capacity (MT)	Capacity (MT)	
		150	175	225	260	260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	3,148,650	100,000	750,876	1,195,661	1,316,989	1,549,573	
2. CASH RECEIPTS							
Company's Revenue		1,800,000	2,100,000	2,700,000	3,120,000	3,120,000	12,840,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	2,494,350	1,440,000	1,800,000	1,440,000	1,800,000	1,440,000	7,920,000
3. TOTAL CASH RECEIPTS	2,494,350	3,340,000	4,000,000	4,240,000	5,020,000	4,660,000	21,260,000
4. TOTAL CASH AVAILABLE	5,643,000	3,440,000	4,750,876	5,435,661	6,336,989	6,209,573	
5. CASH PAID OUT							
Purchases (Machine)	3,170,000	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,260,000	1,008,000	1,058,400	1,310,400	1,375,920	1,444,716	6,197,436
Payroll Expenses (Taxes, etc.)	126,000	100,800	105,840	131,040	137,592	144,472	619,744
Outside Services	100,000	50,000	50,000	50,000	50,000	50,000	250,000
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000

Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	630,000	540,000	540,000	540,000	594,000	594,000	2,808,000
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	224,880	651,616	928,605	1,280,981	1,465,748	4,551,830
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	5,543,000	2,165,680	2,667,856	3,132,045	3,610,493	3,920,935	15,497,009
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	-	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	523,444	887,359	986,627.00	1,176,923	979,887	4,554,240
6. TOTAL CASH PAID OUT	5,543,000	2,689,124	3,555,215	4,118,672	4,787,416	4,900,822	20,051,249
7. CASH POSITION	100,000	750,876	1,195,66	1,316,98	1,549,57	1,308,75	

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Appendix B

Scenario 2- Alternative 1: Investment on the land of industrial zone

WORST CASE

Alternative 2.1 yearly Cash Flow

Projection(worst case)

VIRIYALOHAKIJ slitting line project (industrial zone)		Capacity (MT)	Capacity (MT)	Capacity (MT)	Capacity (MT)	Capacity(MT)	
มิ.ย.-16		100	150	200	250	260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	17,160,400	100,000	1,198,500	2,918,400	5,125,200	7,781,940	
2. CASH RECEIPTS							
Company's Revenue		1,200,000	1,620,000	2,400,000	2,550,000	3,120,000	10,890,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	-	1,080,000	1,440,000	1,080,000	1,440,000	14,130,000	19,170,000
3. TOTAL CASH RECEIPTS	-	2,380,000	3,160,000	3,580,000	4,090,000	17,350,000	30,560,000
4. TOTAL CASH AVAILABLE	17,160,400	2,480,000	4,358,500	6,498,400	9,215,200	25,131,940	
5. CASH PAID OUT							
Purchases (Machine)	2,948,100	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,323,000	945,000	1,071,000	1,092,000	1,146,600	1,203,930	5,458,530
Payroll Expenses (Taxes, etc.)	132,300	94,500	107,100	109,200	114,660	120,393	545,853
Outside Services	-	-	-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising							

	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	-	-	-	-	-	-	-
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
							-
Miscellaneous	-	-					-
Subtotal	4,660,400	1,281,500	1,440,100	1,373,200	1,433,260	1,546,323	7,074,383
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	12,400,000	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	-	-	-	-	-	-
6. TOTAL CASH PAID OUT	17,060,400	1,281,500	1,440,100	1,373,200	1,433,260	1,546,323	7,074,383
7. CASH POSITION	100,000	1,198,500	2,918,400	5,125,200	7,781,940	23,585,617	

NORMAL CASE

Alternative 2.1 yearly Cash Flow Projection(normal case)

VIRIYALOHAKIJ slitting line project (industrial zone)		Capacity(MT)	Capacity(MT)	Capacity(MT)	Capacity(MT)	Capacity(MT)	
มิ.ย.-16		150	200	250	250	260	
	Y0	Y1	Y2	Y3	Y4	Y5	**TOTAL**
CASH ON HAND [Beginning of year]	17,160,400	100,000	2,019,900	4,820,895	7,674,690	10,812,775	
2. CASH RECEIPTS							
Company's Revenue		1,800,000	2,400,000	3,000,000	3,000,000	3,120,000	13,320,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	-	1,440,000	1,800,000	1,440,000	1,800,000	14,490,000	20,970,000
3. TOTAL CASH RECEIPTS	-	3,340,000	4,300,000	4,540,000	4,900,000	17,710,000	34,790,000
4. TOTAL CASH AVAILABLE	17,160,400	3,440,000	6,319,900	9,360,895	12,574,690	28,522,775	
5. CASH PAID OUT							
Purchases (Machine)	2,948,100	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,323,000	1,071,000	1,124,550	1,376,550	1,445,378	1,517,646	6,535,124
Payroll Expenses (Taxes, etc.)	132,300	107,100	112,455	137,655	144,538	151,765	653,512
Outside Services	-	-	-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal							

	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	-	-	-	-	-	-	-
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
							-
Miscellaneous	-	-					-
Subtotal	4,660,400	1,420,100	1,499,005	1,686,205	1,761,915	1,891,411	8,258,636
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	12,400,000	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	-	-	-	-	-	-
6. TOTAL CASH PAID OUT	17,060,400	1,420,100	1,499,005	1,686,205	1,761,915	1,891,411	8,258,636
7. CASH POSITION	100,000	2,019,900	4,820,895	7,674,690	10,812,775	26,631,364	

Scenario 2- Alternative 2: Joint venture with electronic goods partner (industrial zone)

WORST CASE

Scenario2.2 yearly Cash Flow Projection(worst case)

VIRIYALOHAKIJ joint venture with electronic goods partner(industrial zone)		Capacity (MT)	Capacity (MT)	Capacity(MT)	Capacity (MT)	Capacity(MT)	
มิ.ย.-16		125	175	250	250	260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	9,483,220	100,000	864,870	1,573,593	2,377,541	2,708,395	
2. CASH RECEIPTS							
Company's Revenue		1,500,000	1,890,000	3,000,000	2,550,000	3,120,000	12,060,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	7,677,180	1,101,600	1,468,800	1,101,600	1,468,800	14,151,600	19,292,400
3. TOTAL CASH RECEIPTS	7,677,180	2,701,600	3,458,800	4,201,600	4,118,800	17,371,600	31,852,400
4. TOTAL CASH AVAILABLE	17,160,400	2,801,600	4,323,670	5,775,193	6,496,341	20,079,995	
5. CASH PAID OUT							
Purchases (Machine)	2,948,100	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,323,000	945,000	1,071,000	1,092,000	1,146,600	1,203,930	5,458,530
Payroll Expenses (Taxes, etc.)	132,300	94,500	107,100	109,200	114,660	120,393	545,853
Outside Services			-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000

Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	-	-	-	-	-	-	-
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
							-
Miscellaneous	-	-					-
Subtotal	4,660,400	1,281,500	1,440,100	1,373,200	1,433,260	1,546,323	7,074,383
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	12,400,000	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	655,230	1,309,977	2,024,452.00	2,354,686	8,450,833	14,795,178
6. TOTAL CASH PAID OUT	17,060,400	1,936,730	2,750,077	3,397,652	3,787,946	9,997,156	21,869,561

7. CASH POSITION	100,000	864,870	1,573,593	2,377,541	2,708,395	10,082,839	

NORMAL CASE

Scenario2.2 yearly Cash Flow Projection(normal case)

VIRIYALOHAKIJ joint venture with electronic goods partner(industrial zone)

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		Capacity(MT)	Capacity(MT)	Capacity (MT)	Capacity(MT)	Capacity(MT)	
		175	200	250	260	260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	9,483,220	100,000	1,553,600	2,886,898	3,855,548	4,847,543	
2. CASH RECEIPTS							
Company's Revenue		2,100,000	2,400,000	3,000,000	3,120,000	3,120,000	13,740,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	7,677,180	1,468,800	1,836,000	1,468,800	1,836,000	14,518,800	21,128,400
3. TOTAL CASH RECEIPTS	7,677,180	3,668,800	4,336,000	4,568,800	5,056,000	17,738,800	35,368,400
4. TOTAL CASH AVAILABLE	17,160,400	3,768,800	5,889,600	7,455,698	8,911,548	22,586,343	
5. CASH PAID OUT							
Purchases (Machine)	2,948,100	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,323,000	1,071,000	1,124,550	1,376,550	1,445,378	1,517,646	6,535,124
Payroll Expenses (Taxes, etc.)	132,300	107,100	112,455	137,655	144,538	151,765	653,512
Outside Services	-	-	-	-	-	-	-
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000

Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	-	-	-	-	-	-	-
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	4,660,400	1,420,100	1,499,005	1,686,205	1,761,915	1,891,411	8,258,636
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	12,400,000	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal							

	-	795,100	1,503,697	1,913,945.00	2,302,090	8,166,275	14,681,107
6. TOTAL CASH PAID OUT	17,060,400	2,215,200	3,002,702	3,600,150	4,064,005	10,057,686	22,939,743
7. CASH POSITION	100,000	1,553,600	2,886,898	3,855,548	4,847,543	12,528,657	

Scenario 2- Alternative 3: Joint venture with automotive goods partner (industrial zone)

WORST CASE

Scenario2.3 yearly Cash Flow Projection(worst case)

VIRIYALOHAKIJ joint venture with automotive goods partner(industrial zone) มิ.ย.-16		Capacity(MT) 130	Capacity(MT) 180	Capacity(MT) 255	Capacity(MT) 255	Capacity (MT) 260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	9,565,720	100,000	1,088,990	2,153,219	3,389,455	4,202,958	
2. CASH RECEIPTS							
Company's Revenue		1,560,000	1,944,000	3,060,000	2,601,000	3,120,000	12,285,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	7,744,680	1,080,000	1,440,000	1,080,000	1,440,000	14,130,000	19,170,000
3. TOTAL CASH RECEIPTS	7,744,680	2,740,000	3,484,000	4,240,000	4,141,000	17,350,000	31,955,000
4. TOTAL CASH AVAILABLE	17,310,400	2,840,000	4,572,990	6,393,219	7,530,455	21,552,958	
5. CASH PAID OUT							
Purchases (Machine)	2,948,100	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,323,000	945,000	1,071,000	1,092,000	1,146,600	1,203,930	5,458,530
Payroll Expenses (Taxes, etc.)	132,300	94,500	107,100	109,200	114,660	120,393	545,853
Outside Services	150000	30,000	30,000	30,000	30,000	30,000	150,000

Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,000
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	-	-	-	-	-	-	-
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Miscellaneous	-	-					-
Subtotal	4,810,400	1,311,500	1,470,100	1,403,200	1,463,260	1,576,323	7,224,383
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	12,400,000	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]							

	-	-	-	-	-	-	-
Partner's withdrawal	-	439,510	949,671	1,600,564.00	1,864,237	7,904,066	-
6. TOTAL CASH PAID OUT	17,210,400	1,751,010	2,419,771	3,003,764	3,327,497	9,480,389	19,982,431
7. CASH POSITION	100,000	1,088,990	2,153,219	3,389,455	4,202,958	12,072,569	

NORMAL CASE

Scenario2.3 yearly Cash Flow Projection(normal case)

VIRIYALOHAKIJ joint venture with automotive goods partner(industrial zone)

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		Capacity(MT)	Capacity(MT)	Capacity(MT)	Capacity(MT)	Capacity(MT)	
		180	205	255	260	260	
	Y0	Y1	Y2	Y3	Y4	Y5	TOTAL
CASH ON HAND [Beginning of year]	9,565,720	100,000	1,529,510	2,832,098	3,774,318	4,701,317	
2. CASH RECEIPTS							
Company's Revenue		2,160,000	2,460,000	3,060,000	3,120,000	3,120,000	13,920,000
Credit customer		100,000	100,000	100,000	100,000	100,000	500,000
Viriyalohakij's Revenue	7,744,680	1,440,000	1,800,000	1,440,000	1,800,000	14,490,000	20,970,000
3. TOTAL CASH RECEIPTS	7,744,680	3,700,000	4,360,000	4,600,000	5,020,000	17,710,000	35,390,000
4. TOTAL CASH AVAILABLE	17,310,400	3,800,000	5,889,510	7,432,098	8,794,318	22,411,317	
5. CASH PAID OUT							
Purchases (Machine)	2,948,100	-	-	-	-	-	-
Gross Wages (excludes withdrawals)	1,323,000	1,071,000	1,124,550	1,376,550	1,445,378	1,517,646	6,535,124
Payroll Expenses (Taxes, etc.)	132,300	107,100	112,455	137,655	144,538	151,765	653,512
Outside Services	150,000	30,000	30,000	30,000	30,000	30,000	150,000
Supplies (Office and operating)	50,000	40,000	20,000	20,000	20,000	20,000	120,000
Repairs and Maintenance	-	-	50,000	-	-	50,000	100,00

							0
Advertising	100,000	80,000	80,000	50,000	50,000	50,000	310,000
Auto, Delivery, and Travel	-	-	-	-	-	-	-
Accounting and Legal	20,000	25,000	25,000	25,000	25,000	25,000	125,000
Rent	-	-	-	-	-	-	-
Telephone and communication	12,000	12,000	12,000	12,000	12,000	12,000	60,000
Utilities	50,000	60,000	50,000	40,000	40,000	40,000	230,000
Insurance	25,000	25,000	25,000	25,000	25,000	25,000	125,000
Taxes (Real Estate, etc.)	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
							-
Miscellaneous	-	-					-
Subtotal	4,810,400	1,450,100	1,529,005	1,716,205	1,791,915	1,921,411	8,408,636
Loan Principal Payment	-	-	-	-	-	-	-
Capital Purchases [land, building]	12,400,000	-	-	-	-	-	-
Other Start-up Costs	-	-	-	-	-	-	-
Reserve and/or Escrow [Specify]	-	-	-	-	-	-	-
Partner's withdrawal	-	820,390	1,528,407	1,941,575.00	2,301,086	8,152,763	14,744,221

6. TOTAL CASH PAID OUT	17,210,400	2,270,490	3,057,412	3,657,780	4,093,001	10,074,174	23,152,857
7. CASH POSITION	100,000	1,529,510	2,832,098	3,774,318	4,701,317	12,337,143	

VITA

Mr. Phumikron Viriyarungrong was born on 26th Feburary 1989. He studied in Saraburi since elementary to high school in math- science major. He graduated bachelor degree in industrial engineer from Thammasat University English Program of Engineering. During his study, he was a trainee in Electricity Generating Authority of Thailand.

He is currently taking responsibility as project manager of Viriyalohakij co., ltd and General manager of PDR travel company co., ltd. For his study, he is currently taking Engineering business management course at Regional Centre for Manufacturing System Engineering, Chulalongkron University (Cooperative project with the University of Warwick, UK). His research was conduct by his company which is Viriyalohakij to improve and expand business.