Feasibility Study of Business Expansion by the Exploitation through Existhing Strength in a Construction Company

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การศึกษาความเป็นไปได้ของการขยายธุรกิจโดยใช้ประโยชน์จากจุดแข็งที่มีอยู่ของบริษัทรับเหมาก่อสร้าง

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กรคุณ จารุพรพาณิช : การศึกษาความเป็นไปได้ของการขยายธุรกิจโดยใช้ประโยชน์จากจุดแข็งที่มีอยู่ของบริษัทรับเหมาก่อสร้าง. (Feasibility Study of Business Expansion by the Exploitation through Existhing Strength in a Construction Company) อ.ที่ปรึกษาหลัก : รศ.จิรพัฒน์ เงาประเสริฐวงศ์

บริษัท รับเหมาก่อสร้างที่เรียกว่า คอมปะนี-เอ ในเอกสารฉบับนี้ประสบปัญหาทางการเงินเนื่องจากกระแสเงินสดที่ไม่สม่ำเสมอซึ่งทำให้เกิดความเสี่ยงอย่างมากต่อ บริษัท เพื่อลดความเสี่ยงการศึกษานี้มีวัตถุประสงค์เพื่อขยายธุรกิจไปยังอสังหาริมทรัพย์เพื่อให้มีรายรับ เข้าอย่างสม่ำเสมอจากการใช้ประโยชน์จากจุดแข็งเดิมที่มีอยู่ของ บริษัท รับเหมาก่อสร้าง เพื่อเพิ่มจุดแข็งและข้อได้เปรียบในการแข่งขันให้กับธุรกิจอสังหาริมทรัพย์ การศึกษานี้ทำขึ้นโดยการรวบรวมข้อมูลที่แตกต่างกันรวมถึงเอกสารทางวิชาการและข้อมูลที่จำเป็นในการทำกลยุทธ์ทางธุรกิจของโครงการอสังหาริมทรัพย์ที่เลือกไว้และดำเนินการศึกษาความเป็นไปได้ของโครงการเพื่อดูว่าการขยายธุรกิจนี้ได้ผลหรือไม่

การศึกษานี้แสดงให้เห็นถึงความสัมพันธ์ที่แข็งแรงระหว่างธุรกิจรับเหมาก่อสร้างและธุรกิจอสังหาริมทรัพย์โดยการเติมเต็มความเสี่ยงและจุดอ่อนของกันและกันและยังเพิ่มจุดแข็งโดยรวมให้กับ บริษัท สรุปได้ว่าการขยายธุรกิจนี้ได้ผล

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A construction company that is called Company-A in this paper has been facing financial difficulty due to irregular cash flow which makes huge risks to the company. To reduce the risks, this study aims to expand the business to real estate to earn regular inflows in return by the exploitation through existing strength as a construction company to increase a competitive advantage to the extended business. This study is conducted by different sources of literature and data collection including academic papers, and the needed data to do a business strategy of a chosen real estate project, and to run a project feasibility study to see if this business expansion works or not.

This study shows a strong correlation between a construction business and a real estate business by fulfilling each other's risks and weaknesses and also increasing overall strengths to the company. it concludes that this business expansion works.

Field of Study:	Engineering Management	Student's Signature .....
Academic Year:	2020	Advisor's Signature .....

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Last but not least, I am studying this topic not only for a degree, but it is also for my future career.

Gornekhun Jarupornpanich

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1. Background Information

Construction is a type of business that specializes in construction projects, such as building housing, office centers, bridges, roads and infrastructure, and etc. Construction companies are not single entities. In contrast, they are large-scale and multitasking and involve a huge human capital, engineers and a plenty of techniques and machines. Management of the construction companies as a rule involves a project manager, a construction engineer, a construction manager, and a project architect. Despite constructional works, construction businesses deal with strategic planning, analytical operations, and legal.

Business models for construction companies' growths envisage vertical and horizontal integration. Horizontally, companies grow through the acquisitions with other companies on the market that bring mature benefits. Vertically, companies expand their involvement in different industries, for example from construction to real estate. History knows successful examples of both integrations, if implemented skillfully and professionally.

1.1 Background of a Construction Company in Thailand

A Thai construction company that will be called in this paper Company-A was first established in 2000. The company is a well-known construction company that specialize in building retail stores, supermarkets and factories. It was not a good start at the beginning of the company since there was a bubble burst effect that happened in Thailand in 1997 and had caused bad recessions to Thai economy, especially in financial sectors and real estate sectors (Colombo, 2014). As a result, due to the failure of the financial sector and the developers failing to receive money from their clients, it caused domino effects to the developers' suppliers, such as construction companies, raw material companies, and etc.

Throughout the years, Company-A had climbed over many obstructions. It was a difficult task to present a new company to well-known developers, nevertheless, Company-A had an opportunity to join a bidding event of a very well-known retail store and fortunately won the project and that was like a passport to the business. Company-A received many projects constantly from the retail store for more than 10 years. The revenue that earned by the retail store was around 70 to 80 percent of the total company revenue. However, Company-A ended up relying too much on the retail store and as a result, it caused a huge risk. The frustration of the economy and the developers' decision can cause a direct effect in both negative and positive to the company. Even though Company-A has been trying to prevent the risk by expanding customer targets to other sectors, for instant, factory, residential, and commercial, there is still a huge risk for the same reason. Moreover, since each construction company has its own competitive advantage and expertise on specific types of projects, they do not want their competitors getting in their way. They would try very hard to block new companies from stealing their clients by doing a competitive pricing strategy or offering some special services to their clients. Therefore, Company-A sometimes

runs out of projects for a couple months but the company still has to operate the company with high fixed costs and without any income. As a result, the company got buried by the mismatch of the income and outcome.

1.2 Financial Report of Company-A

In order to understand construction business or any businesses, the financial report is one of the tools that would help you to understand the current performance and the future possibility of the business from the historical data. Therefore, to understand the pros and the cons of construction business, let's start with the financial report of Company-A. The financial report of Company-A is contained with the historical data from 2015 to 2019. Each row shows different types of matrix that are required in this analysis which are the total revenue, the direct expense, the direct profit, the bank interest, the operation cost, the total expenses, and the net profit. The last column shows the line-graphs of each matrix that present the changes of the data by year through year for easier understanding. This table will not include VAT also known as "withholding Tax" since it is a mandatory and the company can have some of it back if the net profit is lower than 10%. In addition, this data is collected in the years that did not have economic issues or Covid-19 pandemic in Thailand. Therefore, the use of this analysis might not work in a year that those circumstances occurred. Here, the financial report of Company-A.

ANNUAL FINANCIAL REPORT 2019

COMPANY-A

ALL METRICS

METRIC NAME	2015	2016	2017	2018	2019	5 YEAR TREND
TOTAL REVENUE	฿572,960,313.61	฿604,001,728.24	฿615,708,312.38	฿567,375,139.41	฿706,344,602.23	
		5.14%	1.90%	-8.52%	19.67%	
DIRECT EXPENSE	-฿511,773,445.39	-฿492,045,939.96	-฿496,027,551.79	-฿474,226,049.18	-฿655,545,372.25	
		-4%	1%	-5%	28%	
DIRECT PROFIT	฿61,186,868.22	฿111,955,788.28	฿119,680,760.59	฿93,149,090.23	฿50,799,229.98	
	10.68%	18.54%	19.44%	16.42%	7.19%	
BANK INTEREST	-฿4,985,784.67	-฿4,664,143.44	-฿2,844,928.43	-฿5,052,679.56	-฿5,516,328.56	
OPERATION COST	-฿53,838,850.47	-฿54,551,349.85	-฿67,078,730.20	-฿62,898,103.37	-฿172,290,007.85	
	9.40%	9.03%	10.89%	11.09%	10.23%	
TOTAL EXPENSE	-฿570,598,080.53	-฿551,261,433.25	-฿565,951,210.42	-฿542,176,832.11	-฿733,351,708.66	
	99.59%	91.27%	91.92%	95.56%	103.82%	
NET PROFIT	฿2,362,233.08	฿52,740,294.99	฿49,757,101.96	฿25,198,307.30	-฿27,007,106.43	
	0.41%	8.73%	8.08%	4.44%	-3.82%	

Table 1. Annual Financial Report

As you can see in Table 1, the first matrix of the table is the total revenues between 2015 - 2019. You can clearly see that there was a rise in revenue throughout the years. The trend of the total revenue shows quite a positive performance of the company. It shows that the revenue increased by 5.14% in 2016 from about 572.9 million to 604 million and it stayed quite stable until 2017, nevertheless, there was a huge drop in the revenue in 2018 due to the fact that the main client of the company slowed down expanding their business and that costed the company to realize that they cannot rely on the only one main client alone anymore, so on the 4th quarter of 2018, the company tried to expand its customer target from only building supermarkets and factories to something new like residential projects. Unfortunately, it worked in terms of the revenue! There was a huge gain through so much suffering. Company-A had a chance to receive projects that had never been done, such

as an apartment, an office building, and a hotel in 2019 while still keeping a good relationship with the main client. Thus, the revenue of the company in 2019 jumped from 2018 by 19.67%.

The second matrix shows the direct expenditure of the company. The direct expenditure, here, means the expenditures that happen on construction sites, for example, the expenditure for raw materials, man powers, machines, equipment, and etc. In practice, the direct expenditure should be related to the revenue. In other words, the direct expenditure should be higher or lower based on the change in revenue. However, for construction business, there are many unforeseen factors that are hard to predict for both before and during construction. Almost all the projects that Company-A has received and constructed, came from bidding events which mean that the project prices are not certain. There is a small space between the company losing its capital and the company losing a project when joining the bidding events and that space is where Company-A and its competitors are aiming for. There is some time that construction companies lose bidding for many times and run out of projects and income for a while, they tend to quote a ridiculously low price and win a project eventually but before they realize, they already step in a nightmare. Moreover, things can always happen during constructions since this business still requires human power as its core capital unlike other businesses, nowadays, have much better technologies support compared to the last century. Human errors are a common thing that always happen in construction sites and those human errors can be fixed with money. As you can see in Table 1, the direct expenditure in 2015 is higher than the direct expenditure in 2016 even though the revenue in 2015 is lowest than the revenue in 2016. Therefore, you can easily analyze from data in 2016 and 2017 that they had a better

efficiency in both "before" and "during" processes than in 2015. However, if you compare 2015 with 2019, it is a totally different sad story. You can see that the revenue in 2019 increased from 2018 by 19.67%, nonetheless, the direct expenditure increased by 28% which is not a good sign for the business at all. Let's move on to the next matrix.

Based on the previous two matrices, the direct profit is calculated by setting the value of the total revenue minus the value of direct expenditure and the percentage below the direct profit comes from the value of the revenue divided by the value of the direct expenditure and time a hundred. It clearly shows in the table that all the five years gained its direct profits. However, there are other internal costs like the bank interest and the operation cost. These factors play a big role in construction business since most construction projects require the contractor to invest first, for example, if you were a contractor, your client most likely pays you by the progress of the work you have done based on the contract both of you agreed with, such as, weekly and/or monthly. Sometimes they gave you 10% - 20% of advance money but that money would help only the very first months of the project. Therefore, knowing how to use financial tools is very important. Thai banks come up with many types of loans to help SME and corporate companies to have better liquidity in their business and that help cost some interests that you have to repay. Moreover, what really an issue of big companies is that they have a high operation cost. Operation cost is contained with salaries, allowance, bonuses, office's utilities, company trips, and etc. these costs can decide whether you win or lose a bidding event. If you have a low operation cost, you can already have a competitive advantage over your competitors since your competitors and you have to build the same thing. Now, let's go back to Table 1, you can see that the operation cost of Company-A had increased every year from 2015 to 2019. The operation

cost was only around 50 million in 2015 and because of the economic boom that time drove the real estate sector upward. By the end of 2015 to the early 2018, there were too many projects coming to the company that the company sadly needed to give up some of them and due to the exceeded amount of projects, the company had to hire more and more full-time staff to match the number of projects received and that made the operation cost rise to about 67 million by the end of 2017, nevertheless, not thing last forever, in 2018 there was a downturn of the business circle in the real estate sector. As mentioned, the company ran out of any projects for a while and due to the lead time of the project received, it cost a bad bullwhip effect to the company. As a result, the company needed to get out of the comfort zone to something new, to something bigger. That time, there was an invitation to Company-A to join a bidding event of a 5 stars resort project that had been abandoned from a previous construction company due to the fact that the previous company had faced a lot of problems during construction and finally ran out of money to continue the project. Due to the hunger of projects at that time, Company-A saw the 5 stars resort as an opportunity to expand the company size and a customer target, so the company fought for a price and won the project eventually. That was a big mistake for the company for several reasons:

1. The project is too big for Company-A. It required huge financial liquidity and numbers of staff which forced the operation cost to rise even more.
2. The staff had no experiences. It was a new type of project that had never been done. Company-A used to build only supermarkets and factories. Those types of buildings do not require much architecture details. On the other hand, a 5-star hotel is all about architectural works.

3. It was the second hand project that the previous contractor failed to do. Company-A was handed over with about 70% of the remaining works. There were tons of hidden problems like water leakage, wrong specification of materials, and wrong construction procedures everywhere in the first 30%. As you know, starting from the beginning is much easier than starting from somebody else's mistakes.

This project was such an experience for Company-A since the company had to give up all the profits for 2 years for this project. As you can see in Table 1, even though there were some direct profits in 2019, there was a huge loss in the net profit in 2019 due to the high direct expenditure and the high operation cost. As a result, the company lost more than 27 million Baht in 2019 even though that nightmare project was only half way done and would have to finish another half in 2020. The next section will analyse what happened in 2019 in detail.

1.2.1 Analysis of 2019

2019 was one of the hardest years of Company-A so far. It is a perfect example of how risky a construction company could be in a normal circumstance. For now, let's skip 2020 since, as one knows, the whole world's economy shrinks due to Covid-19 pandemic. For Company-A, 2020 has been like a disaster after a nightmare. However, let's focus on 2019. According to Table 1, it shows that the problem that happened to the company was not that there was a lack of revenues but it was because of high direct expenditures cost and high fixed internal costs. Therefore, let's break those costs into detail to analyse the problems.

1.2.1.1 Direct Profits and Direct Expenditures

Direct Profits & Direct Expenditures

2019

YEAR	PROJECTS	INCOME	OUTCOME	DIFF	%
Unfinished Project from 2018	Retentions	THB 619,891.50	THB 6,737,271.81	(THB 6,117,380.31)	-987%
	Project.1	THB 10,970,836.84	THB 9,497,250.66	THB 1,473,586.18	13%
	Project.2	THB 6,583,813.77	THB 8,554,635.03	(THB 1,970,821.26)	-30%
	Project.3	THB 29,942,672.66	THB 27,379,798.19	THB 2,562,874.47	9%
Projects of 2019	Project.4	THB 218,668,518.45	THB 217,689,420.25	THB 979,098.20	0%
	Project.5	THB 5,621,000.00	THB 4,504,417.77	THB 1,116,582.23	20%
	Project.6	THB 5,780,000.00	THB 4,181,563.51	THB 1,598,436.49	28%
	Project.7	THB 129,444,786.63	THB 112,838,596.85	THB 16,606,189.78	13%
	Project.8	THB 23,356,693.32	THB 19,764,415.02	THB 3,592,278.30	15%
	Project.9	THB 59,155,142.70	THB 59,703,032.35	(THB 547,889.65)	-1%
	Project.10	THB 125,057,342.99	THB 107,114,393.03	THB 17,942,949.96	14%
	Project.11	THB 34,995,245.00	THB 28,832,755.28	THB 6,162,489.72	18%
	Project.12	THB 9,542,093.04	THB 6,976,234.71	THB 2,565,858.33	27%
	Project.13	THB 44,356,565.10	THB 40,782,948.25	THB 3,573,616.85	8%
	Project.14	THB 140,000.00	THB 79,860.00	THB 60,140.00	43%
	Project.15	THB 2,100,000.00	THB 908,779.54	THB 1,191,220.46	57%
	Total	THB 706,334,602.00	THB 655,545,372.25	THB 50,789,229.75	7%

Table 2: direct profits & direct expenditures (2019)

According to Table 2, it shows all the direct incomes and the direct outcomes within 2019. Retention, as you can see in the first row of the matrix, is the contract warranty that Company-A agrees with each client in the previous years. Some projects have a 1-year warranty and some have more which means that within the warranty, the company has to keep fixing all of the issues that the company has agreed. The problem, here, is that there are some local clients that intend to delay the retention payments and many times this problem needs to be solved at a court. As it shows in the table, the retention income is only 619,891.5 Thai Baht while the outcome is almost 7 million which is almost a thousand

percent difference. Other than the retention works, there were 3 unfinished projects from 2018. These projects mostly started in the 3rd or the 4th quarters of the previous year. As you can see, there was quite a huge loss in Project.2, nonetheless, this might not be 100% true since this project might have made a profit in the first half and the amount of this project revenue is less than 1% of the total revenue, so it was not considered as a critical issue. In addition, there were 12 projects that started within 2019. As it shows, most of the projects managed to earn some direct profits except Project.4 and Project.9. These two projects happened to be projects that Company-A had never done before. Project.4 is a 5-stars hotel & resort or also known as a nightmare project for the company while Project.9 is an office building. The problem of Project.9 is that Company-A's staff lack experience in building a low-rise building since the company always built factories and supermarkets that had less than 3 floors. Project.9 did not go well in both construction procedure and manpower wages/ salaries. As one knows, when there is something wrong, money can fix it and this theory works very well in the construction business. Company-A had to hire a couple expert engineers to fix the issues that had occurred and also had to pay some compensations for the project delay. On the other hand, for Project.4, even though the difference between income and outcome is still positive, the bubble was about to explode due to the fact that Company-A was provided with 20% advance payment from the client at the beginning of the project. it means that from the second until the end payment, the company could receive only 80% of the total progress of the work and the progress of Project.4 that shows in the table was only half way done but the advance payment had been used up and with this information, you can easily predict what happened in 2020. To sum up,

at the end of 2019, the company managed to earn 7% of direct profit. However, what really hurt the company is not only high direct expenditures but also the high operation costs that put so much pressure on the company's shoulder. The operation costs are actually the cost that really haunt the company and it kept rising from about 50 million Baht in 2015 to about 70 million Bath in 2019. The question is what made it increase so much in only 4 years? Therefore, the next section will go through each operation's cost and analyse them in detail.

1.2.1.2 Operation Costs

Operation Costs				
		2015	**2019**	Diff
1	Salary	**THB 29,723,000.00**	**THB 42,983,473.50**	31%
2	Incentive	THB 1,676,769.41	THB 2,412,000.00	30%
3	Severance compensation	THB 1,300,000.00	THB 1,665,560.00	22%
4	Consultant	THB 4,300,000.00	THB 4,972,000.00	14%
5	Machine depreciation	THB 6,230,000.00	THB 8,014,915.72	22%
6	Financial cost	THB 4,800,000.00	THB 5,383,305.48	11%
7	Ground rent	THB 2,330,000.00	THB 3,080,000.00	24%
8	Head office maintenance cost	THB 923,400.00	THB 1,100,087.16	16%
9	Security	THB 243,000.00	THB 234,500.00	-4%
10	Office utility	THB 432,000.00	THB 429,782.25	-1%
11	DC storage	THB 943,000.00	THB 932,000.00	-1%
12	Printer/ Document	THB 180,324.00	THB 207,505.89	13%
13	Social security	THB 757,356.59	THB 874,878.00	13%
	Total	**THB 53,838,850.00**	**THB 72,290,008.00**	26%

Table 3: Operation Costs (2015 & 2019)

According to Table 3, it shows the rise of the operation costs between 2015 and 2019. As you can see, the total operation cost rose about 20 million in only 4 years which is about 26% increased, but what is the reason? The first reason is that there was an increase in

revenue. Based on Table 1, the revenue of the company in 2015 was around 573 million Baht and it increased to around 706 million Baht in 2019 which means that the revenue increased by 19%. Therefore, it would not be surprising since most of the operation costs are fixed costs and no matter if the company has a project or not, the company still has to pay them, for example, salary, machine depreciation, office utility, and etc. In addition, the second is that, as you can see in Table 3, there are also many operation costs that increase more than 19% in four years, especially the salary. As mentioned earlier, when there is a problem, the fastest way to fix the problem is using money. Here, the company, in 2019, needed to hire many more engineers and staff to do the jobs. As a result, the company had to carry a huge amount of employees' salaries and when the problem was done, there was a mismatch of the number of staff and projects which made the company get burdened by the high operation costs. As a result, the company needs to keep chasing new projects to maximize the use and the value of the operation costs.

1.3 Problem Statement

"High risk, high return" could be a good phrase to describe construction business. As mentioned, there are risks everywhere in construction business, for example, financial risks, legal risk, safety risks, and etc. However, some of the risks can be mitigated by being prepared. Offering the right price for the project is the first step. The right price, here, means that not too low to lose all profit, and not too high to lose a bidding. Then, having the right construction methods and the construction procedure is the second. Things can go way too wrong to be fixed if you do not have the right method and procedure before starting a project. As you know, fixing requires more time and money than starting from the beginning.

Next, hiding the right professionals who have experiences in a specific type of project is the third. Just like a phrase that says that "Put the right man to the right job". The best way to fix problems is to prevent them before they occur. Those professionals know what to do, and what to prepare in both before and during a project. Lastly, having just enough machines is the fourth. Some construction companies have their own machines, and some rent them. Both are fine but as you can see in Table 3, the high machine depreciation cost can be troublesome to the marketing team since they have to keep finding new projects to cover the cost. Company-A mostly rents big machines since the construction machine rental market is quite competitive in Thailand, so the rental price is acceptable and the company can also reduce the maintenance cost and the land rental cost to keep them. At the same time, having just enough machines also means that the company must not be too frugal with machines since they have a direct effect on both time and quality of a work. Having these four things can surely reduce the problems and the risks of construction business. On the other hand, there are also some problems and risks that a construction company cannot avoid.

1. Unforeseen problems that occur during a construction. Terrains and climates of an expected project area must be studied before beginning construction. An underground work could be a classic example of unforeseen problems since it is very hard to predict what is down there. Contractor, sometimes, have to deal with underground rocks or groundwater during piling works. Moreover, concrete, as you know, can be damaged and lose strength if there is rain during cementing, so it is not a very good idea of building something during a rainy season.

2. Human errors. There is not much improvement in technology and technique in construction business for the last decades. Unlike other businesses, there are more involvements of new technologies and new innovations that can increase accuracy and quality of a product or a service. Construction business still requires a lot of manpower. As one knows, humans are not machines, they make mistakes all the time.
3. Sensitive to economic uncertainty. Construction business is very sensitive to economic fluctuations since the business highly depends on their suppliers and clients. Building something requires a huge amount of investment, so if there is an uncertainty of the economy, investors tend to delay or even stop the investment. Therefore, if a company was not prepared and had some savings for such a situation, the company could run out of work for a while and in the worst case might have to close down. Smaller construction companies may have higher possibility to survive than the bigger companies in this situation since the bigger companies have to carry a huge amount of operation cost.
4. High financial risks. Construction business requires a very high financial liquidity. Financial liquidity is very important for construction business since liquidity is an ability to use its current asset or in this case "cash" to meet its short-term liability or in this case "raw materials". In Thailand, many local suppliers do not allow contractors to buy their supplies on credit, they accept only cash, so the only way is you must have cash on hand. In addition, construction, as mentioned, is a type of businesses that contractors have to

invest first and charge clients by progresses of a work and 5 to 10 percent of the payment would be cut out as a retention for a certain time depending on a contact that a contractor makes with a client. Secondly, another problem is that not every client is a good client, some clients are tricky. They sometimes try to take advantage of a contractor by delaying or not paying payment with some unacceptable reasons. Last but not least, most of corporates' KPI is to increase profit by increasing revenue and/or reducing internal cost, and the construction cost is one of the biggest costs. Therefore, they come up with a digital E-Auction platform for their contractors and suppliers to seize the cheapest prize as possible. In the downturn of the economy when there were not many new construction projects, the platform made the bidding not much different from gambling.

To sum up, some of the problems and the risks in construction business can be reduced by offering the right price, having the right construction methods, hiding professionals, and having the right and enough machines. However, there are some other problems and risks that are like the nature of construction business, such as unforeseen problems, human errors, very sensitive to economic uncertainty, and high financial risks. As you can see, even knowing all these problems, it is still very hard to prevent them and most of the times more than one of them would likely to happen at the same time. Therefore, this research will study the effectiveness of business expansion by the exploitation through existing strength in a construction business on what business would help reduce the existing risks and problems. At this point, one might think that there is nothing good about a construction business but in fact, the strength of this business is it is able to generate money very fast and

also can grow double and/or triple size in a short length of time. By having right staff and partners, that deeply understand these problems and have expertise in all types of construction like structural, architectural, mechanical, and electrical combining together can minimize cost of construction to the lowest to compete in a competitive market that every construction company tries to win price wars which is one of the strength that could be benefit the future extended business. The next section will be the objectives of this research.

2. Research Objective

The paper aims to investigate both positive and negative effects of business expansion by doing vertical integration for a construction company.

In particular, the research will focus on:

1. Expanding the business by using existing strengths to earn a competitive advantage in a new market segment.
2. Using the strength from the extended business to fulfill the existing weakness of the business

2.1 Research Question

The research questions are as follows:

1. What kind of businesses would bring out the best from the existing strength in a construction company?
2. Is business expansion of a construction company advantageous to the extended business and which specific benefits it brings to the company in return?
3. What could be risks and threats of this business expansion?

3. Hypotheses

We hypothesize that business expansion by doing vertical integration of a construction company is a highly effective business strategy that allows to decrease the impact of external threats in the industry and also increase some strengths and opportunities.

4. Research Methodology

The research is conducted by means of the critical analysis of literature and the needed data to run feasibility studies from different sources. The discourse of the literature corresponds to the topic of the research. Having analyzed the literature and the collected data, we would manage to achieve all the objectives of the research and to derive importing findings that are presented in the section Results and Expectation Benefits.

5. Literature Review

To conduct the study, we have chosen different sources of literature, including previous researchers and online publications. The discourse is rather broad and refers to both theoretical papers and studies that reveal practical implications of the vertical integration business strategy. In overall, the sources of literature were chosen in a way to research the issue of vertical integration from different aspects.

The article by Tarver (2019) provides an overview on vertical integration, comparing business strategy with horizontal integration. This article is important to the research, as it

reveals the major features of vertical integration, including the benefits it brings to a business. Also, the core difference with the opposite business strategy, horizontal integration, is explained. According to the author, the main idea of the vertical integration refers to the acquisition of business operations within the same production vertical (Tarver, 2019). The major benefits of the strategy refer to boosting profit and immediate access to consumers. To compare, a horizontal integration refers to the acquisition of one company with another company that operates at the same level in an industry. In this case, the integration helps to expand business in size, to achieve greater diversification of the products and services, to reduce competition and to enter new lucrative markets (Tarver, 2019).

The reasons for vertical integration can be different and depend on the company's performance. Therefore, some companies have on purpose to enforce their supply chain, while others have on purpose to reduce production costs and obtain access to the new distribution channels.

Vertical integration can be achieved through different ways, such as internal expansion, an acquisition, or a merger (Tarver, 2019). There are also two ways of vertical integration: backward and forward. In our research, we will focus on a forward integration, which refers to a control of the post-production process and will also explain the reason why not to choose the backward vertical integration in the analysis section.

The article by Daibes (2017), discusses major benefits of investing in real estate. The article is highly important for the research, as it uncovers some positive features of a vertical integration of a construction company. As the research has a specific focus – an integration to

a real estate company, the article will make a significant contribution to the research. However, the article is rather limited as it reveals only the benefits of investing in real estate and does not specifically deal with vertical integration, regarding different ways of investment.

According to Daibes (2017), the benefits of real estate investing include steady income, long term financial security, tax benefits, covered mortgage payments, appreciation of capital assets, inflation, and a complete autonomy and control over the real estate investment. For example, the scholar is convinced that investing in real estate deals with long-term financial security, as land and buildings are appreciating assets. Talking about taxation, the scholar suggests that rental income is not subject to self-employed tax. What is more, there are different governmental tax breaks that bring numerous advantages to the investors. One more example refers to inflation. Daibes (2017) suggests that high rates of inflation have a positive effect on the businesses, as property value raises in such cases.

The topic under research deals with a construction company, so it is critically important to assess the risks in the industry. According to the research by Stakeholder Map (2019), the sphere of construction is risky enough but the risks are moderate if compared with other industries, such as software or engineering. The risk management overview offers important information to the current research, such major reasons of risks in construction from a historical point of view. For example, the reasons include high levels of disputes and litigation, poor safety and occupational health record, pressure to save time and money, intense competition for work and many others (Stakeholder Map, 2019).

Also, the research by Stakeholder Map (2019) reveals risk types in construction. They include client risks, contractor risks, health and safety risks, and fire risks in construction projects. The classification of risks helps to conduct an adequate assessment of forward vertical integration prospects to a construction company.

The study by Koeleman et al (2019) deals with practical experiences in business transformation rather than theories and concepts. Specifically, the study discusses the engineering and construction companies that have captured the full benefit of digital across their enterprises. Five practices are differentiated by the researchers to reveal a digital transformation: focus on fixing pain points, implementation of digital use cases, reskilling and restructuring engineering teams, adjusting project baselines to capture value and connecting projects to unlock impact within the company (Koeleman et al, 2019).

The study by Koeleman et al (2019) can make a significant contribution into the current research, as it reveals a practical process of organizational transformation. The problem of the study refers to the construction companies stuck in "the analogue era" by which they mean lack of digitized operations. One of the causes of insufficient digitation refers to the short expectations by the companies. Therefore, digital transformations are not associated with long-lasting improvements of business sustainability. As vertical integration to a real estate company is also a transformation, it will be important to derive some wise lessons from the study by Koeleman et al (2019) on construction companies' transformation. What is more, digitizing is one of the segments to be updated in case of the vertical integration to a real estate company, as it will increase business sustainability. The challenges discussed in the study by Koeleman et al (2019), such as fragmentation,

decentralization, etc. refer specifically to the construction companies and would be useful to our study as well.

The article Stfalcon.com (2019) discusses main tendencies and trends in real estate concerning digital transformation in the nearest future. The article supports and develops that ideas by Koeleman et al (2019), suggesting that digital transformation in real estate is inevitable as the relative advantages are really impressive. For instance, it is suggested that technologies would help the real estate companies to manage big data on owners, renters, agents, etc. CRM tools can be absolutely reliable and highly effective in this case. Also, a shift to the cloud makes a sense to make the process of communication with clients more effective. One more advantage refers to mobility, achieved with the help of the real estate applications that allow quick and permanent access to all the important documents on the go.

The article by Stuckey and White (1993) on when and when not to vertically integrate will add to the current research quite more objectivity. Indeed, any business strategy is effective in theory because they have their benefits and successful implications on practice. However, it is always important to conduct an adequate analysis before jumping into a certain type of integration. According to the scholars, vertical integration is a risky strategy because it is complex and expensive. However, they also offer to consider four major reasons to integrate vertically. First, the integration would bring benefits if the market involves many risks and is highly unreliable. Second, other companies in adjacent stages of the industry chain have more market power. Third, integration should increase market power by allowing price discrimination. Last, the market is either young or declining. In the first case, the

company will contribute to market development. The scholars are convinced that the first reason is the most beneficial for vertical integration. A similar article by Jurevicius (2013) provides an even broader theoretical overview of a vertical integration. The article provides a list of vertical integration disadvantages that are important to investigate to obtain objective results.

6. Analysis of the Vertical Integration

Vertical integration is a business strategy used by different companies in different industries. For example, such world recognized companies as Amazon, Volkswagen, Huawei, Apple and many others resorted to vertical integration at certain stages of their development. Construction industry is not an exception and also can benefit from vertical integration both backward and forward. Our specific focus was made to forward integration, as the real estate operations refer to the post-production process.

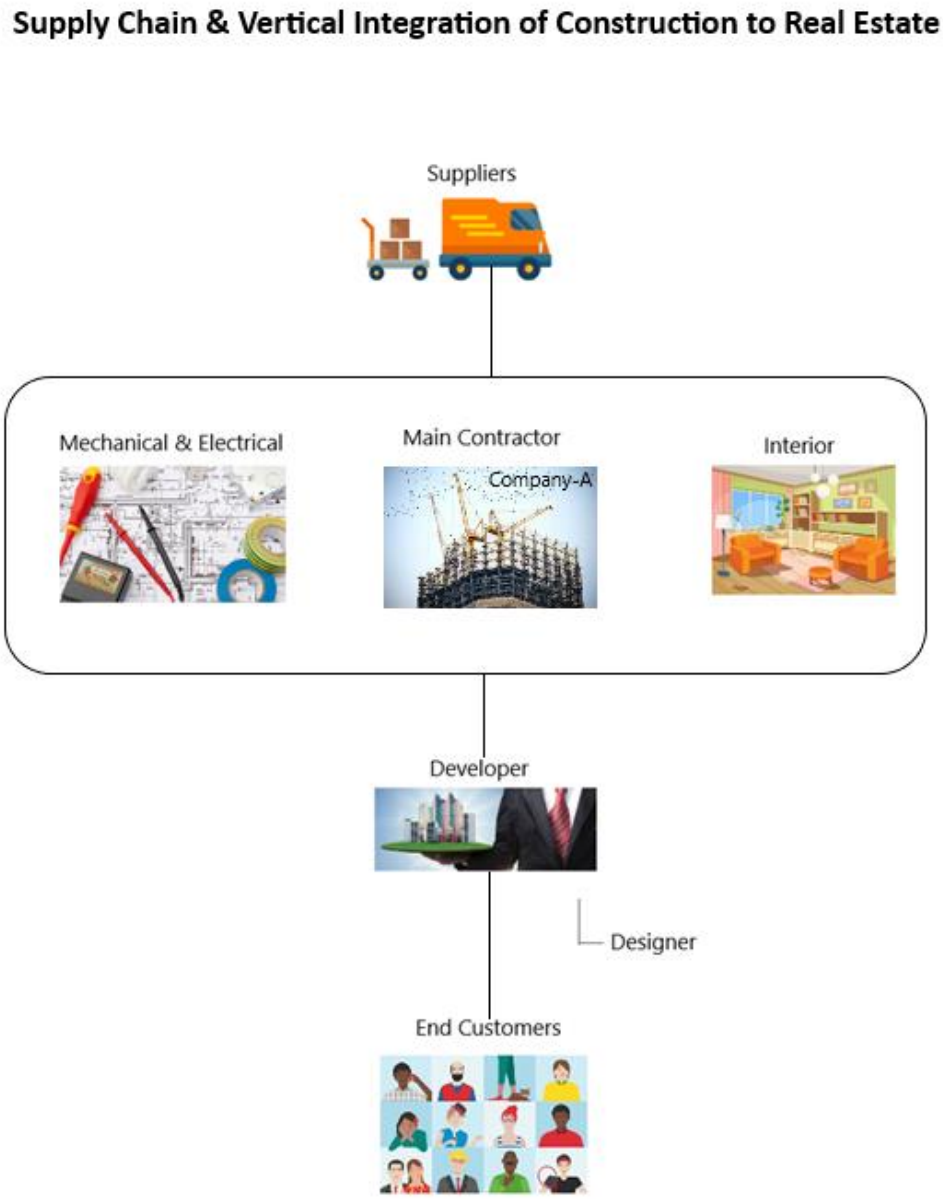


Figure 1. Supply Chain & Vertical Integration of Construction to Real Estate

According to figure 1, vertical integration (VI) is a strategy that allows to gain control over the value chain of the industry. In other words, the strategy allows the company to participate in multiple activities (industries) instead of one. For example, a construction company that is engaged in building and planning can also enroll in retailing of their finished construction projects.

Prior to integration, it is crucially important to consider two issues: costs and scope of the company (Jurevicius, 2013). Therefore, it was found that VI would be effective when the costs of making the product inside the company do not exceed the costs of buying that product in the market. Also, a company should consider its current competencies – specifically whether they would not be weakened by the integration. In case of VI, the range of new activities and business operations significantly increases. As a result, management and control becomes more complicated and the company would require new specialists and new workers. In such a way, prior to VI it is important to analyze a company's sustainability and use obtained data to predict the level of integration – whether it would be partial or full.

Industry value chain involves the following elements: raw materials, intermediate goods, manufacturing, marketing sales and after-sales services (Jurevicius, 2013). A company with a none level of integration deals only with construction. In case of partial VI, a company can also enroll in marketing sales for instance. If the level of integration is full, the company is engaged in all the industries within the value chain. The integration from a construction to real estate does not require a full level of integration. Correspondingly, a transformation would not bring striking changes to a company which prevents business destabilization.

On the other hand, in case of a construction company, why not backward VI? There is a simple answer to this. In this case, backward VI cannot reduce or prevent the problems that a construction is facing in both short-term and long-term. Even though backward VI could gain the company in revenue and profit in the long-term, it will eventually face the same problems which are relying too much on economic and real estate developers. Moreover, it is much harder to accomplish as a raw-material distributor since every

distributor sells the same things such as concrete, steel, glasses and etc. There is not much difference in innovation of the materials between the distributors. Therefore, the best business strategy is price leadership and that requires an enormous amount of investment. Another question would be "why not horizontal integration?". The answer is very simple. It is because horizontal integration, in this case, might increase the revenue and profit but it does not solve the problems that the company is facing.

6.1 Challenges of Construction Companies

Contemporary business environment on the markets is highly competitive and includes many threats. The same refers to the construction industries. Construction companies of present days face serious challenges that may significantly affect their sustainability and growth. The major challenges to consider refer to labor shortages, stagnant productivity levels, safety, technology adoption and others (Jones, 2018).

The critical analysis of the literature showed that today it is difficult to find skillful professionals in construction, especially in the developed countries. For example, in the US over 20% of the employees in the construction industry are 50 and older. In comparison, only 9% of the employees are 24 and younger (Jones 2018). Also, many professionals in construction retired over the last decades. As a result, the industry of construction faces another challenge – adoption of new technology. Indeed, we found a connection between two mentioned challenges – labor shortages

and technology adoption. Technologies and innovations are welcomed by young ambitious workers, while older employees got used to methods and approaches they use for ages and consider effective and reliable. There is a high probability that the construction industry is slow at adopting new technologies, such as drones, robots, 3D printers, VR headsets, BIM and others, because older workers do not want to spend their time and efforts on mastering new approaches and methods in construction.

According to a brief overview of the risks by the Stakeholder Map study (2019), there are some risks that occurred historically and have a significant impact on the industry until present days. For example, they mention such historical reasons as poor record of completion to cost and time or poor safety and occupational health record, and others (Stakeholder Map study, 2019). The analysis of other articles showed that the vast majority of the reasons can be effectively eliminated in cases of technologies implementation. What is more, the construction risk management process indispensably requires introduction of new technologies to update the assessment procedures.

Currently, they distinguish several types of risks in construction. Below is the classification of the risks, provided by the Stakeholder Map study (2019).

Client risks refer to the factors of cost time and quality. This category deals with such risks as feasibility risk, design risk, funding risk and commercial risk.

Contractor risk deals with the tender stage, when commitments are made to project's price and timescale.

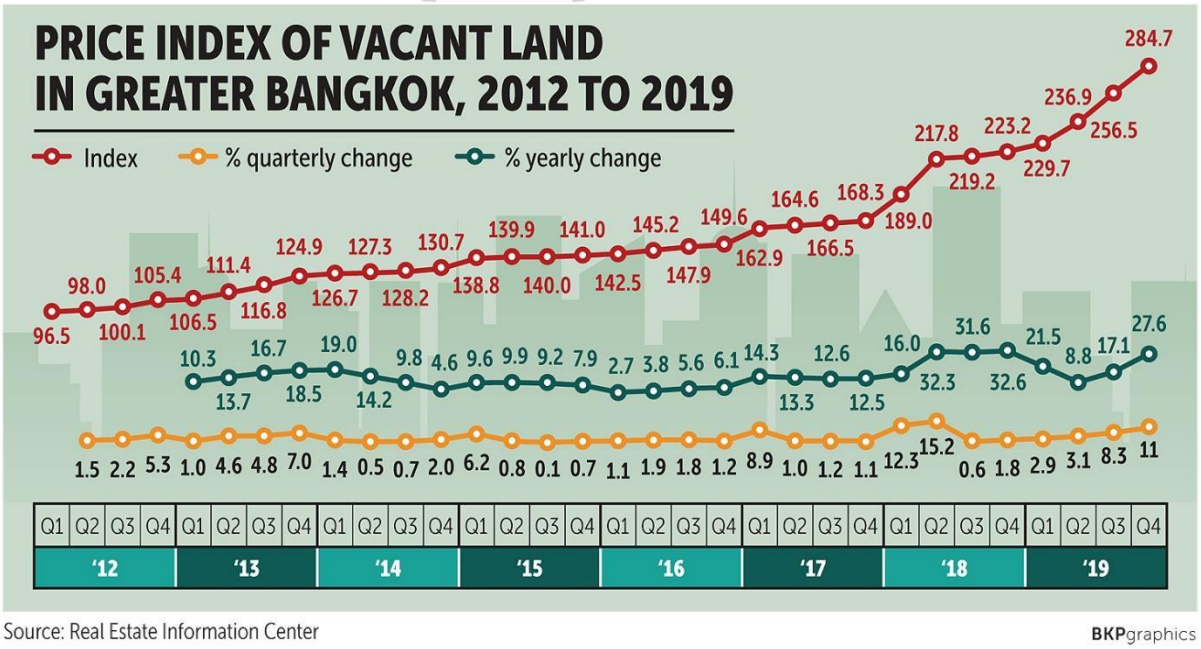
Health and safety risks refer to the workers in the construction industry, which is highly hazardous. Every week two people die on construction sites according to the statistical data. What is more, 90% of the cases can be avoided with the help of effective management of health and safety risks.

Fire risks have been always topical for the construction industry. To prevent them, it is important to use inflammable construction materials, to provide fire-fighting equipment and to instruct people how to use it. Innovative technologies also can be helpful in this case.

The analysis showed that there is a contradiction between the construction industry and the real estate industry on the basis of the technologies adoption. Therefore, the construction industry is featured with a slow technological adoption, while the real estate industry adopts innovations and technologies rapidly. This contradiction can cause both benefits and problems to the company. On the one hand, different levels of technological advancement of the industries can affect the overall sustainability of the company. The company should demonstrate wholeness on the other hand, so the integration to a real estate company can be a good basis for technological upgrade of the business.

6.2 Prospects of Real Estate Company

Real estate company is a company that buys, sells, and rents properties. Real estate companies have numerous advantages in comparison with construction companies, which refers to different spheres of organizational life. First, real estate companies refer to the reliable sources of income. By this the scholars mean that the real estate industry deals not only with sales but also with rents, which is a passive source of income. What is more, rental prices increase in cases of economic fluctuations. Also, rental cash flow can increase if you rent the properties in different locations or even in different markets. It is possible if the construction company operates on the international market or on several foreign markets.



Diagrams 1: Price Index of Vacant land in Greater Bangkok, 2012 to 2019

According to Diagram 1, it proves the price index of vacant land in Bangkok, Thailand has risen over the years. Real estate industry offers long term financial security. The feeling of security is associated with the property's appreciation in value over time. Obviously, there are no 100 percent guarantees that the value would grow, but if the buildings are located in different markets, some of them will obviously get higher in prices.

Real estate companies often benefit from taxation policies, as there are numerous tax breaks provided by the national governments. What is more, long term investment in real estate means lower tax rates. In addition, the mortgage payments can be held from the tenants to prevent not paying rent and to maintain good relationships with them.

Appreciation is also a very important benefit of the real estate industry. The experts are convinced that investment in real estate is lucrative because the property owned by the company will be worth in decades from the present time and it allows to establish far-reaching strategic plans.

Unlike a construction industry, a real estate industry is more defended in cases of economic turmoil. For example, high inflation would contribute to the increase of rental income and property value.

Eventually, a real estate company is more flexible and independent in decision making. Factors mentioned above might contribute to business long-term stability and financial autonomy, which allows a management team to enroll in risky deals and to boost their business.

To conclude, the real estate industry is an attractive industry for vertical integration because it opens doors to numerous prospects of business development.

7. Business Strategy & Data Collection for Projects Feasibility Studies

The objective of this section is to collect the data and study physical possibilities of real estate including economic, land selection, land restriction/legal, types of real estate, financial and any other factors that may have effects on the success rate on investing in real estate. First, let's start with the big picture of Thailand by using PEST analysis.

7.1 PEST Analysis of Thailand

PEST analysis is a tool used to identify macro forces facing an organization which in this case is Thailand. The letters stand for Political, Economic, Social, and Technology. The outcome of this analysis can lead to opportunity and threat in SWOT analysis. Moreover, the organization that can successfully monitor and respond to the change of PEST analysis can create competitive advantage over their competitors (Oxford, 2016). Let's start with some facts about Thailand before moving to PEST analysis.

Facts of Thailand

Indicator	Description
Population	69,330,400: 51.1% live in urban (4Q 2020)
Life expectancy	73.6 years (71.2 - man, 76.1 women)
Land Area	513,120 Sq. km (Density = 137 person per Sq. km)

Administrative Geography	6 regions with 77 provinces
Language	Thai (1st), English (2nd), Chiese (3rd), ethnic and regional dialects
Religion	Buddhist (93%), Muslim (5.5%), Christian (0.9%), and others
Literacy	98.14% (15 year and above) (2018)
Currency	Thai Baht (THB)// 1 USD = 31.2 THB (4Q 2020)
GDP	543. 65 Billions USD (2019)
GDP per Capita	6,502.60 USD (2019)
Capital City	Bangkok
International tourist	40 million people (2019), Bangkok is the most visited country in the world

Table 4: Fact of Thailand

7.1.1 Political

Politics is always a very fragile and sensitive topic for most people all around the world. Friends can have a big argument or even unfriend each other by just having different perspectives about politics or supporting a different government party. It depends on where you are to look at it. Same as many other countries, Thailand has also been facing many political problems for the last decade. There was always at least one person who was unsatisfied with the government. The past prime ministers of Thailand always faced many political rallies that went against them with civil commotions and finally cost them to leave

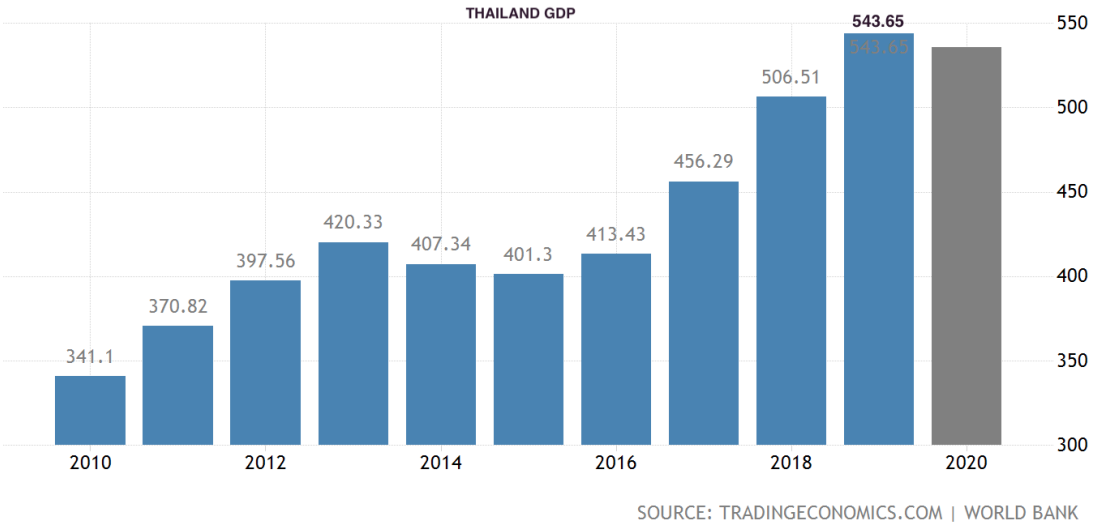
the position and that cost huge economic recessions to Thailand, until today, the scar still remains. Unfortunately, even though the scare does not yet heal, the same issue is happening again to the current prime minister. Again, there are political rallies who have doubts about the president and want him to leave the position (Prashanth, 2020). This certainly has effects to Thai economy.

Covid-19, as you know, has been one of the biggest threats in world history, nonetheless, the Thai government did quite a good job dealing with this pandemic situation. The government and Bank of Thailand agreed to enforce the law to help SMEs and big corporations by providing a special soft loan with a very small interest rate from 7% down to 2% and also allow them to pause the principal payment by paying only interests for 12 months (Bank of Thailand, 2020).

7.1.2 Economic

Thailand is a country located in Southeast Asia where it is surrounded by Myanmar to the west, Laos to the northeast, and Cambodia to the southeast, and the Gulf of Thailand to the south. Moreover, Thailand is the only country in Southeast Asia that has never been colonized by any European countries in world war II. (Derek, 2019). Doesn't it sound interesting? As you can see, Thailand is located in the strategic location where it is in the middle of Southeast Asia. Therefore, Thailand is one of the first countries in Southeast Asia that international investors consider expanding their business to since their products or their business can easily expand to the neighborhood counties.

Thai currency is called Baht and the exchange rate of Baht to US Dollar is about 30 Baht equal to 1 USD which is about the same as Taiwan Dollar.



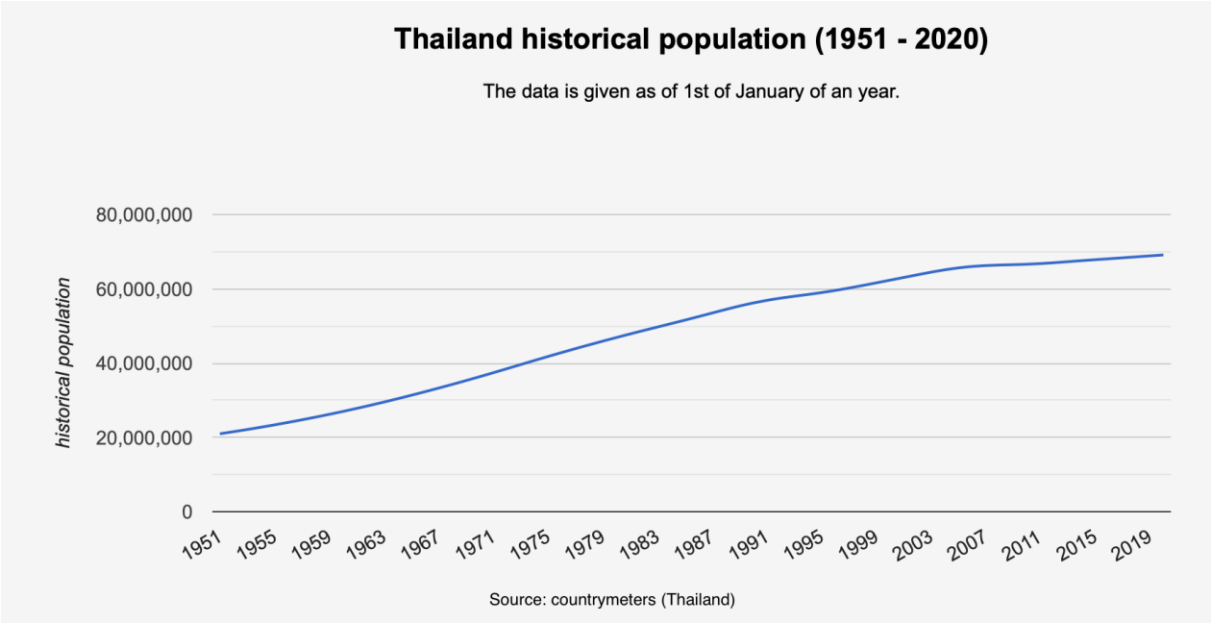
Diagrams 2: Thailand GDP

According to Diagram 2, it shows that Thai GDP rises constantly over the years. In 2019, GDP of Thailand reached 543.65 billion USD which is ranked in numbers 23 of the most earned GDP country. However, Thailand is one of the countries that has a huge gap between rich and poor people. Even if the GDP of Thailand is ranked in number 23, the GDP per capita of Thailand is way lower than that. Unfortunately, the GDP per capita of Thailand is ranked in number 85 due to the fact that the average earned per one person is only 8,194 USD per year (StatisticTimes, 2020). In contrast, what is good about Thailand is that the living fee is very low. The price of one meal can start from less than 1 USD and there are many budget apartments that are located in the downtown that cost less than 100 USD per month. As a result, by comparing the percentage of homeless per population with the other developed countries like the UK or USA, the number of Thailand's homeless community is surprisingly low. There are only about 3,300 homeless people all around Thailand and that is only 0.005 percent of Thai population (Stuart, 2017).

In addition, even though the Covid-19 pandemic occurred at the beginning of 2020, the unemployment rate in Thailand does not seem to hit the roof. According to Trading Economics, it shows that the unemployment rate in Thailand was always about 1 percent since 2001, however, due to the Covid-19 pandemic, it costs the rise in the number of unemployment rate to 1.9 percent. Nevertheless, there is data that shows that Thailand is still in the top 10 countries that has the lowest unemployment rate in the world (Walters, 2020). However, the problem, here, is that the pandemic has huge effects on the real estate sector since the people are afraid to spend money on big assets like a house or a car. Plus, huge investors like Chinese people cannot come to Thailand due to flight cancellations. As a result, the supplies are over the demands.

7.1.3 Social

According to Table 4, you can see that the population of Thailand is reaching 70 million and about 51.1% live in the urban area. However, based on Countrymeter (Thailand 2020), it shows that the population growth rate of Thailand has been decreasing throughout the years, nevertheless, the growth rate stopped decreasing in 2015 and stayed still at 0.38% until 2020.



Diagrams 3: Thailand historical population (1951 - 2020)

As you can see in Diagram 3, it shows that the slope of the population growth rate has been dropping by a bit throughout the years and if the slope hit to the peak of the curve and the line becomes perfectly horizontal, the population growth would stop and start to decline. This is just like any other county in the world that they are heading to an aging society. Thai population growth rate is expected to drop below zero in 2030. Thailand is also one of the countries that is heading to an aging society which, one day, would have elderly citizens more than working age citizens. This means that Thailand would probably face a shortage in income in the future since the working age citizens are the one who produce tax for the country the most. However, the life expectancy of Thai people is 73.6 years which is more than the average of the world that is only 71 years. According to Nikkie Asian, it shows that Japan is one of the first countries that pushed the limit of retirement age from 60 to 65 and even tried to extend it even more to 80 years to fix the aging society issue. This solution would never work if the average life expectancy of the country is low.

In addition, the land area of Thailand is 513,120 square meters which is ranked in number 13 of Asian countries and number 3 of Southeast Asia countries after Indonesia and Myanmar respectively (Geoba, n.d.). Thailand has 6 regions which are the capital of Thailand, Bangkok, Eastern Thailand, Northern Thailand, Northeast or also known as Isan, Southern Thailand, and Western Thailand which all divide into 77 provinces. There is a little bit of difference in dialect between each region, nevertheless, all Thai children are forced to learn in the capital dialect in their class room, and learn English as their 2nd language as you can see in the table. Moreover, Thailand is very well known for its culture, like the gesture when Thais say hello or goodbye, food and places like temples. There are a wide range of people and cultures that mixed together in Thailand, nonetheless, more than 90% of Thai people are Buddhists (CountryMeters, n.d.). By all the reasons mentioned, Thailand has become one of the destination countries that people all around the world would love to visit. According to Statista (2020), it shows that the number of tourists that visit Thailand has rocked up every year. The number shows that in 2019, there are almost 40 million travelers visiting Thailand which is about 60% of the Thai population. By this information, you can predict that tourism is very important for Thailand. It is one of the biggest business sectors that drive the Thai economy and because of Covid-19 pandemic at the beginning of 2020, Thailand has been facing a huge economic recession. Thai GDP is expected to drop around 8.3% at the end of 2020 which is higher than the average of the world recession that is only 3.2% (Munprasert, 2020).

7.1.4 Technology

Due to the fact that, nowadays, the world is in the digital era and social media are all around places. There are digital disruptions to many businesses, that many of them who do

not adapt to it, have to close down. To be able to write and read is required to live and work in society. Thailand is one of the developing countries that are aiming to be a developed country in a short future. Thus, it is the government and parents' job to increase the potential of the youth. Plus, there is a high competition for professional employees across the world. There are more options for the employers to pick the best employees for the positions and many time they pick expat employees, so this forces Thai people to try harder and to learn more and as a result by collecting data from Thai youths between 15 - 24 years, the literacy rate goes above 98% which is ranked in number 8 in Asia (Moore, 2020).

There is a huge gap between the capital city and the countryside of Thailand. As one knows, Bangkok is one of the most developed cities in the world while many parts of Thailand are still in the green area. According to Statista Researching Department 2020, it shows that the number of the Thai smartphone users have been rising since 2015 due to the fact that Thai internet service companies can provide a much greater signal range of internet service throughout the country and also provide it with a much better quality of the signal. Moreover, due to Covid-19 pandemic, ecommerce platforms and/or e-market platforms have become the trend of the world. During the quarantine, many Thai people started to learn how to online shopping and buying food from smartphone applications. As a result, it shows that the smartphone users in Thailand is expected to reach 52.71 million people in the end of 2020 and that is about 76% of the Thai population and the percentage is expected to reach 100% in 5 years (Statista, 2020).

Social media is a trend nowadays. People express their opinions, show off their cool/memorable pictures, learn new things, and even earn money from social media.

Thailand is ranked in number 8 of the most Facebook users in the world even Though Thai population is much smaller in number compared to the countries that are in the better rank. This shows that Thai people see the use of technologies and are flexible to learn new things.

Figure 2: New Train Line in Bangkok

In addition, according to Figure 2, the Thai government has announced and confirmed that there will be thirteen new train lines across Bangkok city. Some of them are already under construction and expected them to be done in a few years. The deeper details of the new train lines will be provided in the feasibility study section.

After analyzing PEST analysis of Thailand, it concisely gives some explaining and situations about what is going on in Thailand right now in the 4 perspective points of view. This information could be used in the future SWOT analysis section to decide what are

strengths, weaknesses, opportunities, and threats based on the location and type of the project that would have the highest rate of success for Company-A since every land and location has its own character and demand. You cannot use the same SWOT analysis or any other analyses for 2 real estate projects that are located in different areas. Therefore, the next section will decide where the expected project location is and what could be the restrictions of the location.

7.2 Location & Restriction of the Expected Project

The location of the project for the project feasibility study will be chosen from the assets of Company-A since Company-A has been collecting several raw lands in order to gain trust and credits from banks and planning to develop them in the future. Moreover, it would be much easier in terms of financial for the company to start investing in real estate on its own asset as their first project since the company does not have to buy new land. Each of the assets is located in different areas. Each of them has different price, size, demand, and target customers, nevertheless, all these assets have potential to be developed into something in the future. All the factors mentioned will be counted into consideration to pick the most potential asset and use it for the feasibility study in the next section.

According to Home Loan Experts, there are five things to watch out before investing in real estate as provided below.

1. Location & zoning: as one knows, location could be one of the most important factor to consider to invest on a land and it is also a factor to choose what kind of real estate could it be since there are differences in target customers in each area and also the usage restrictions that are applicable in each zoning, for example, you can

only build a high-rise building in urban area, and you can only build a huge factory in industrial areas that are restricted by government.

2. Size & shape: size is also one thing to consider due to the fact that if the land is very huge, it is also hard to sell, and if you want to develop it by yourself, it requires a huge amount of investment. Likewise, if the shape of the land is very rough and not in any kind of square shape, it would be also hard to develop and sell.
3. Infrastructure: infrastructure here includes access roads, and public utilities such as electricity and water. Even though the size and the shape of the land is perfect, it would be very hard to consider from banks if the land does not have direct access roads and the access of any utilities.
4. Your financial position: you cannot loan money from a bank to buy raw land to just wait and sell it at a higher price without any project finance. The best way is you must have your own savings to buy raw land, and then you can request a project finance of the raw land from a bank to develop the land. Moreover, in order to develop real estate, there are so many additional costs such as legal costs, surveyor fees, land tax, and etc. Therefore, the amount of money you have and the size of your expected project must be matched.
5. Property history: there are always reasons for a cheap property or an expensive property. Some cheap lands in the middle of a city might seem like a good deal but those lands could be contaminated with dangerous chemicals. Whereas, an old house in a rural area could be surprisingly expensive due to a reason that it used to own by a well-known person. Therefore, before investing in a property or a raw land, you must re-check the history of the property or the land cautiously.

As you can see, if you want to buy a house or rent an apartment, these five factors could be a very good guideline and a checklist before spending money on it. However, other than these five things to watch out, in order to have a higher rate of success on your project if you want to be a real estate owner, there are several more factors that should be taken into consideration, for example, if you have a raw land and plan to develop it into something, the first thing you should do is to decide whether your land has potentials to make profit or not by seeing the surrounding business, expected competitors, expected customers, and etc. Then, you can use that information to decide what type of projects could be in that location before starting investing on the chosen location but what is more important is you must have a completed detail of business strategy and business feasibility that show a positive result. The key success factor is that you must not lie to yourself about the data and always prepare with the worst case scenario since a land owner, as one says, always thinks that his or her own land is the best. Here, the purpose of Company-A wants to vertically integrate into real estate is to earn passive incomes to reduce risks when there is an economic crisis and to help the company to pay the operation cost when the company runs out of projects. As a result, there are three potential properties that could be a pilot project of Company-A. They are in different sizes, shapes, and located in different areas which would be called in this study; Property-X, Property-Y, and Property-Z. The details of each property and the analysis to select the most potential one would be provided as follows.

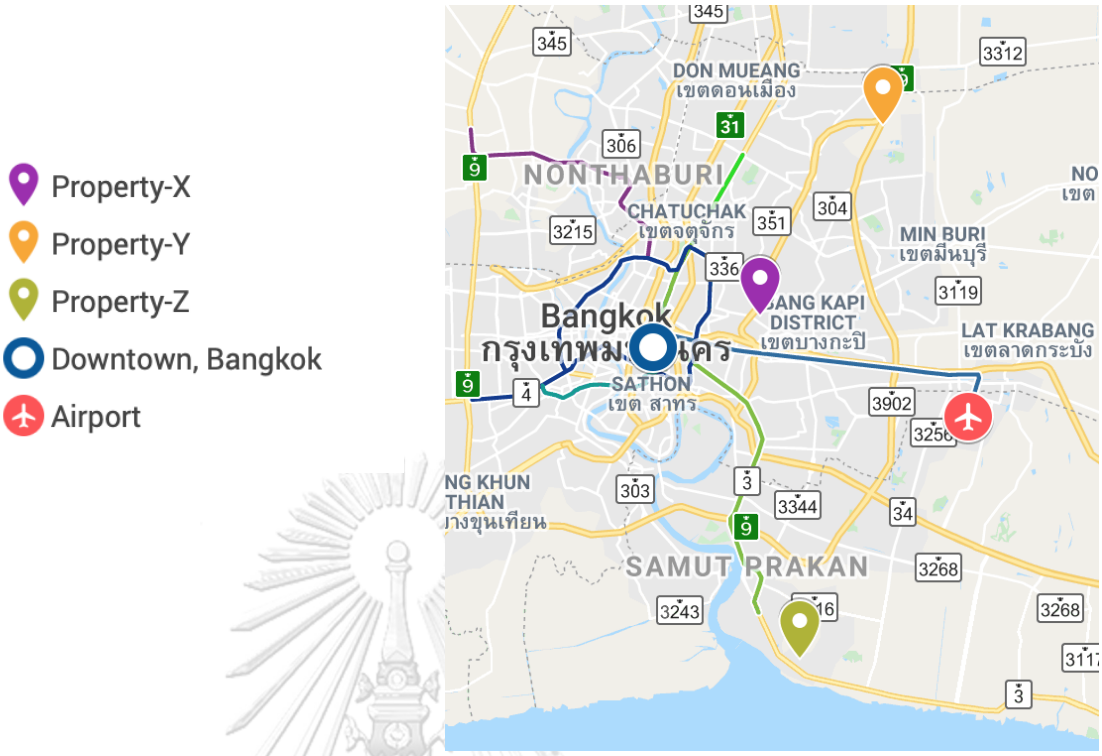


Figure 3: Strategic Locations

According to Figure 3, there are five strategic locations that should be taken into consideration which are the locations that show in the map. Property-X is in the pinpoint shape in purple color, Property-Y is in the pinpoint shape in orange color, Property-Z is in the pinpoint shape in green color, the downtown is in blue circle and the airport is the red airport icon. it shows that all the properties are located in different areas which means that in order to choose the most potential property to develop, it is also required the land restriction, and target customers of each property. However, one thing that is clear is that all the three properties are not in the center area of Bangkok, so the project cannot be a high-rise building.

7.2.1 Comparing & choosing a land

Property-X

Figure 4: Property-X's Map

According to Figure 4, the red box is the area of Property-X. The size of the land in the red box is approximately 470 square wahs or 1,880 square meters and the shape of the property is approximately in square shape where the main road is in front and the sup-roads are on the left and right of the property. The price of this raw land is about 100,000 baht per square wahs, so the total price of the land is 47 million baht. This property is the closest to the downtown among the three properties as you can see in figure 3. It is about 14 kilometers far from downtown and about 25 kilometers from the airport. Most of the surroundings in the area are offices, houses, and restaurants.

Property-Y

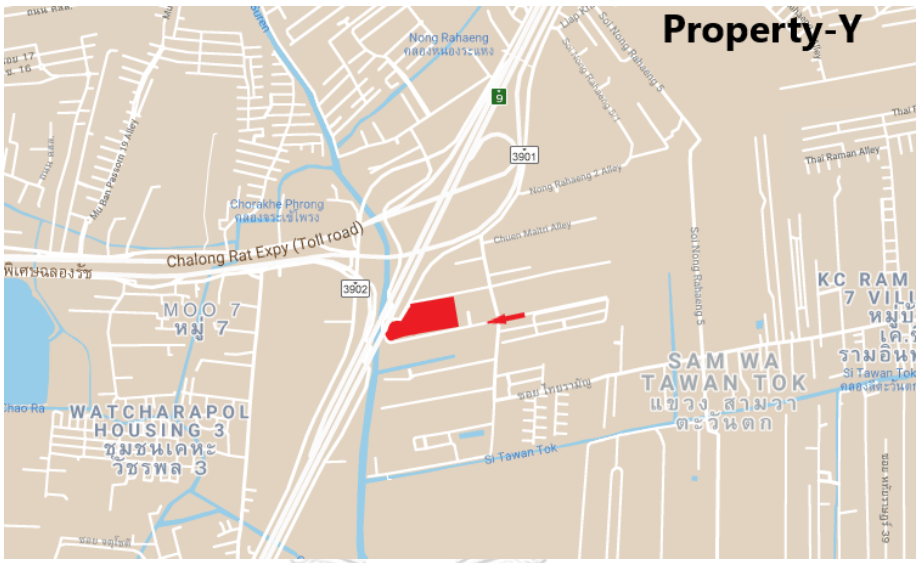


Figure 5: Property-Y's Map

According to Figure 5, the red area is the area of Property-Y. As you can see in the map, the shape of Property-Y is somewhere in between square and pentagon shape, and the size is about 2,800 square wahs or 11,200 square meters which is a lot bigger than Property-X. However, there is only one way in and out since the access road is blind alley. Therefore, the price of the property is about 15,000 baht per square wahs or 42 million baht in total. This property is located in a rural area where it takes 31 kilometers to the downtown and 27 kilometers to the airport. Most of the surroundings in the area are villages and farms.

Property-Z

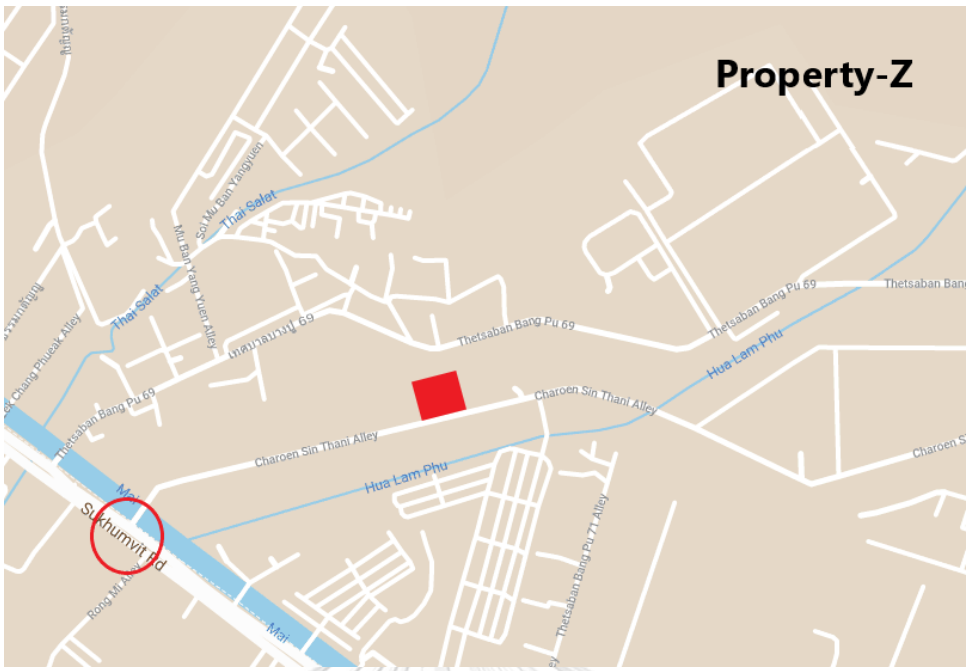


Figure 6: Property-Z's Map

According to Figure 6, the red box is the area of Property-Z. The shape of the land is almost in a perfect square and the size of the land is about 800 square wahs or 3,200 square meters where there is a road on one side of the property and the road is connected to the main road of Thailand as it shows in a red circle. The price of the raw land is about 25,000 baht per square wahs or 20 million baht in total. The distance between Property-Z to the downtown is similar to Property-Y, which takes about 32 kilometers to the downtown and 35 kilometers to the airport, nevertheless, this property is located in an industrial area where most of the surroundings are factories and storages.

7.2.1.1 Properties Analysis

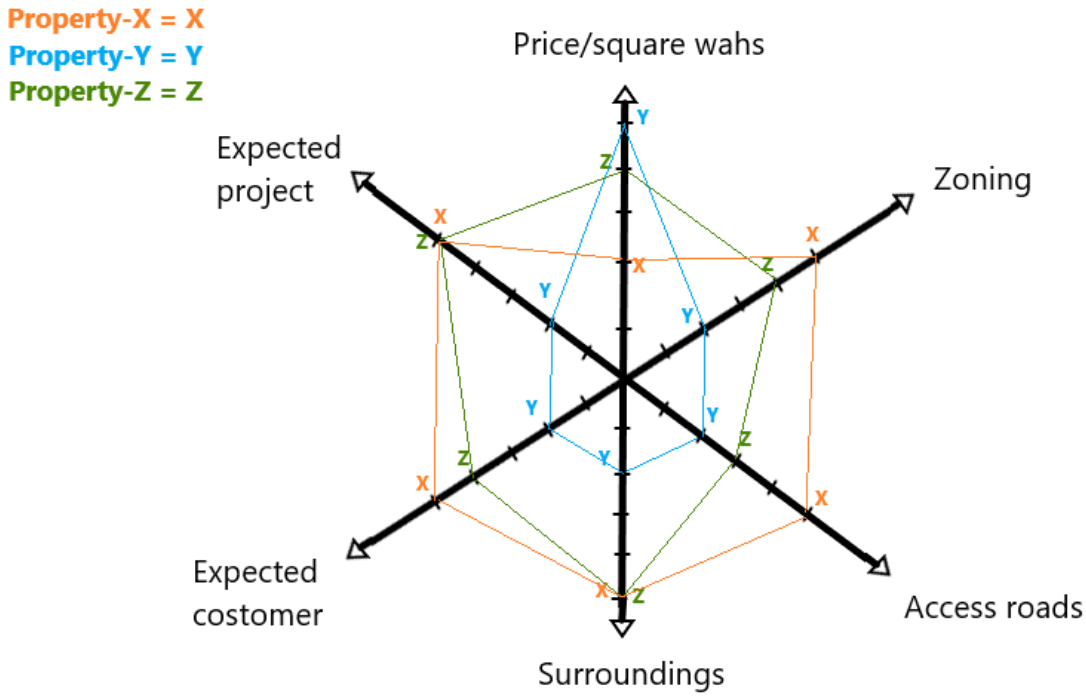
Property	**Property-X**	**Property-Y**	**Property-Z**
Criteria			

Size & Price	**470 sq. wahs** **100,000 Baht/sq.w**	**2,800 sq. wahs** **15,000 Baht/sq.w**	**800 sq. wahs** **25,000 Baht/sq.w**
Zoning / Area	**Urban area** **14 kg to downtown** **25 kg to airport**	**Rural area** **31 kg to downtown** **27 kg to airport**	**Industrial area** **32 kg to downtown** **35 kg to airport**
Access Roads	**3 sides around the property**	**1 side in front the road is blind alley**	**1 side in front and the road is connected to the main road of Thailand**
Surrounding & population density	**Offices, homes, restaurants**	**Villages, farms**	**Factories, storages**
Expected Customers (purchasing power)	**Office workers, business owners, small families**	**Big families, farmers**	**Factory workers, business owners**
Expected Project Commercial or residential project (passive income)	**Office, apartment, condominium, home, commercial building**	**Storage, village, farm**	**Storage, factory, apartment, home**

Table 5: each property characteristic

Every property, every land, and every location has its own unique characteristic and charm. Each of them has different strengths and weaknesses. It depends on what type of real estate you plan to develop and who your customer target is. As you can see, all Property-X, Property-Y, and Property-Z have potential to develop into something, nonetheless, there will be only one property to be chosen to be the pilot project for Company-A.

According to Table 5, it shows that Property-Y has the biggest in size among the three properties, however, its price is pretty fair compared to the other two. Whereas, Property-X and Property-Z are smaller in size compared to Property-Y, and they are surrounded with more varieties of businesses, like offices and factories, nevertheless, the price of the raw lands are much higher in return, especially Property-X. In order to choose one out of the three properties, there are 6 criteria that will be shown in a diagram that would be taken into account which are Price, Zoning, Access Roads, Surroundings (population density), Expected customers (purchasing power), and Expected projects (passive income). Each criterion will have the maximum of 5 points and which property earns the most points will be chosen to be the pilot project of Company-A and will be analysed in detail in terms of business strategy in the next section.



	Price/Sq. wahs	Zoning	Access Roads	Surrounding (Population density)	Expected Customer (purchasing power)	Expected Project (Passive income)	Total
Property-X	2	5	5	5	5	5	27
Property-Y	5	2	2	2	2	2	15
Property-Z	4	4	3	5	4	5	25

Diagrams 4: Properties Comparison

The statement below will analyze the diagram and the table and cut the least potential property one by one to decide which property would be the candidate of the project. According to Diagram 4, Property-X is orange line, Property-Y is blue line, and Property-Z is green line. It clearly shows that Property-Y has the smallest statistics among the three of them. Even though it shows that it has the cheapest price, it is not a match for the other two. As you can see, for all the stats other than price, Property-Y has significantly less potential due to the fact that it is located in a rural area where there are not many businesses around and even though the size of the property is big, this could be a double-edged knife because it also determines that it would require a high amount of money to invest on the land. On top of that, the surroundings of Property-Y do not convince Company-A to be able to invest on something that can receive passive incomes since most of the surroundings are villages and farms which also has the least population density amoung the three locations. As a result, the total score of Property-Y is 15 out of 30 which is the lowest among the three of them.

On the other hand, the stats of Property-X and Property-Z are very close which are 27 and 25 out of 30, here are some reasons. In terms of the surroundings, both of them have about the same level of attractiveness since they are located in the areas that are surrounded with many businesses, so it is much easier for Company-A to come out with a project and to predict and analyze the areas' supply and demand which will lead to the expected project that could possibly be a long term investment project, such as, an office or an apartment that can be the company's passive income in the future. As a result, both properties earn the maximum score for the surroundings and expected projects criteria. However, there is a huge gap between the price of Property-X and Property-Z. As one knows, price of lands is one of the most important factors that you must consider before investing in real estate since it is a factor that directly reflects your project and customers, nevertheless, it is not everything since if you can come up with the right project, and the right business strategies, whatever price is acceptable as long as you can afford it. Based on Diagram 4, you can see that Property-Z has a higher score in price compared to Property-X. However, it makes sense that Property-X is a higher price since it is located closer to the downtown, and the area contains a higher density of population. Plus, the people around the area have more purchasing power, so due to the high demand and customer power, it raises the value of the project in return. For example, in order to invest in Property-X, it might require a lot more money than the other two properties but if the property can sell or rent it at a higher price, it might take a shorter time to break-even and even earn more profit. Furthermore, the magic of real estate is that the price of lands always rises through time. Some lands' prices rise every year, and some take longer depending on the factors that have been mentioned above. As a result, Property-X is the winner since it earns the highest score

in overall criteria, so this property is chosen to be the pilot project for Company-A and to see how a long-term investment in real estate could reduce risks in a construction company.

7.2.2 Surrounding details

One said that there are three rules you must remember before investing in real estate and the rules are Location, Location, and Location. However, that is not always true! Even though you have the best land location in a city, if you came up with an unsuitable project to the area, your project would never be successful. After having Property-X as the pilot property of this vertical integration, then you must decide what type of project you are going to develop to maximize the capability and the values of the land according to its price, the surrounding businesses, the citizens around the area, the expected competitors, and main public transportations in order to earn the maximum profit out of the land. Here, there are some places that should be taken into consideration around the property which are government offices, department stores, schools/universities and hospitals because these places are important factors for our future customers to decide to lease or to rent a property. The reason that offices and houses are not included is because here Property-X is already located in the area that is surrounded with offices and houses. Moreover, the reason that houses are not one of the places that should consider is because of the goal of this vertical integration is to reduce the risks of Company-A in the long term, building a house for sale, in a short period, is not the answer for this integration even though it might earn more profit as a single real estate company. Therefore, more information about the property will be provided as follows.

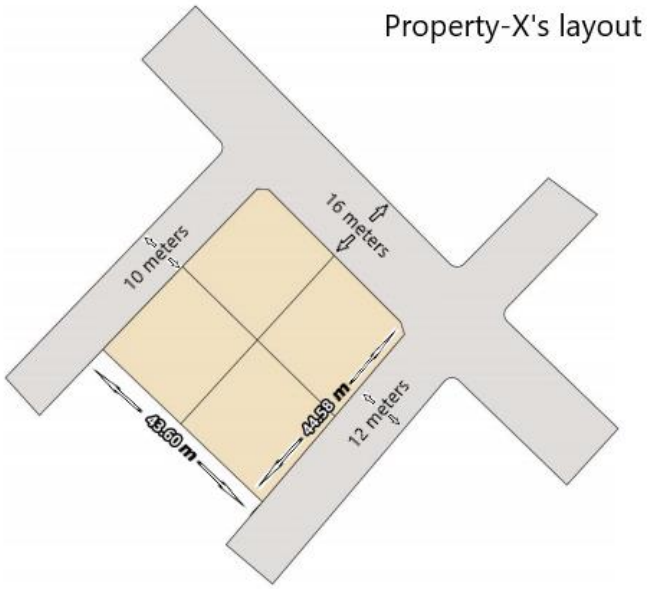


Figure 7: Property-X's layout

According to Figure 7, the shape of the Property-X is almost perfect square. It has 43.60 meters in length and 44.58 meters in width where there are 3 access roads around the property. As it shows, the main access road on the top is 16 meters wide, the one on the left is 10 meters wide, and the one on the right is 12 meters wide. These numbers are needed to decide how big and tall the building can be built according to the area restriction. The next section will show the surroundings of Property-X.

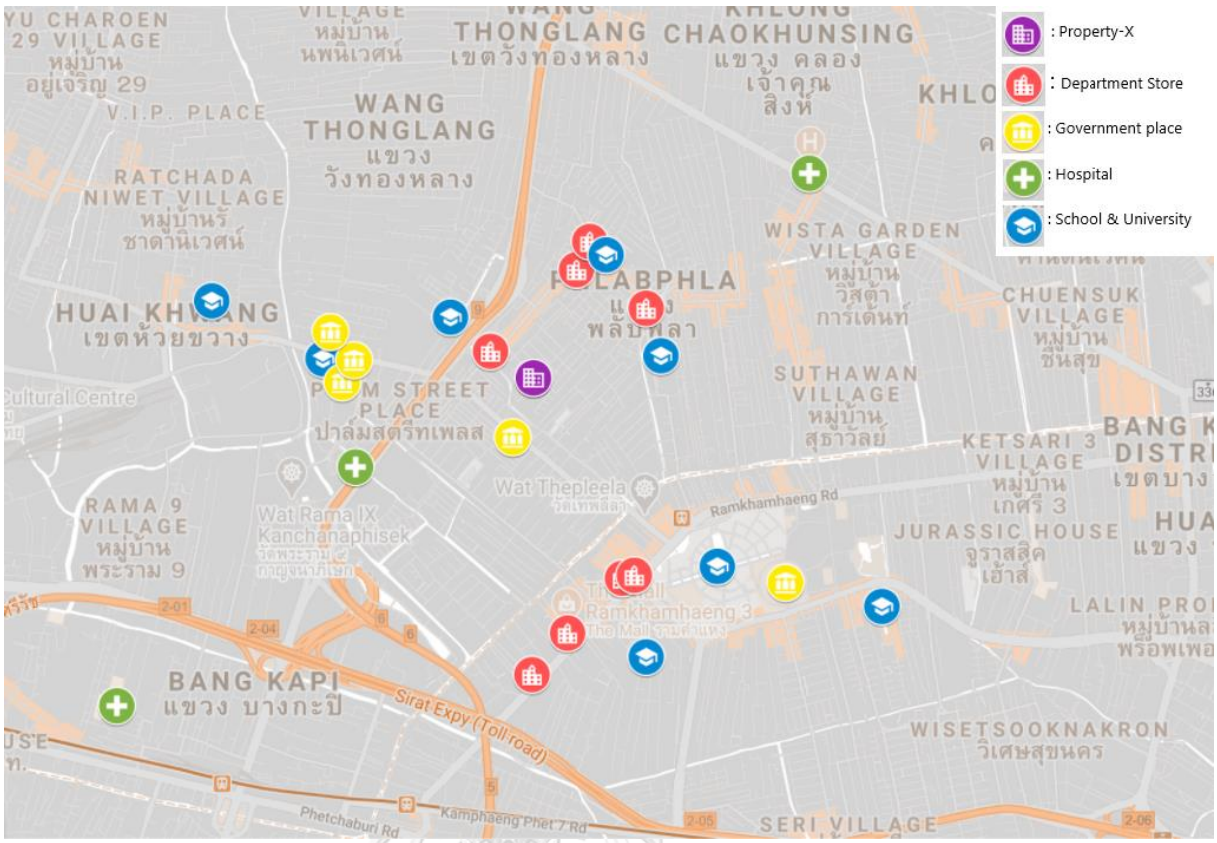


Figure 8: Property-X's Surroundings

According to Figure 8, it shows the attraction places around Property-X within 5 kilometers. As you can see, Property-X is the purple icon in the middle of the map where it is surrounded with many department stores, schools/a university, government places, and hospitals. Here, it shows that there are 8 Department Stores in the red icons, 7 schools and 1 university in the blue icons, 5 government places in the yellow icons, 3 hospitals in the green icons. By this information, it can make a rough assumption that Property-X is located in quite a strategic area where there should be demand in itself.

In addition, there is a public announcement from the thai government that there are plans to build thirteen new lines of public trains across the city of Bangkok as it shows below

(Malilee, 2020). Fortunately, Property-X is located in the middle of three of them as shown below.

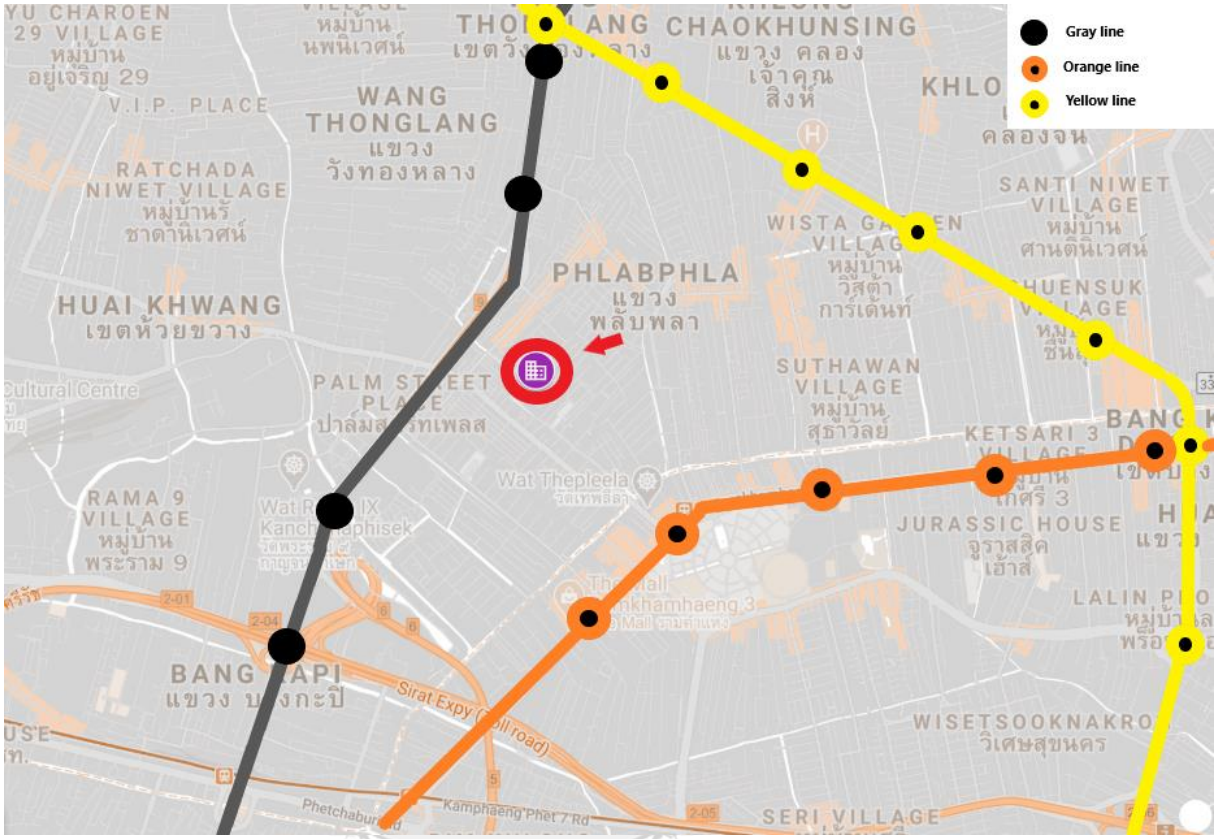


Figure 9: New public trains road map

According to Malilee, there will be three new public train lines constructed close to Property-X that shows in Figure 9.

1. Grey line is an electric monorail sky train which has an approximate length of 39.91 kilometers through the downtown and this train line will be connected to the current main train line. Expected start date of the construction is 2021.
2. Yellow line is also an electric monorail sky train which has an approximate length of 30 kilometers across the east side of the city and this train line is

connected to the airport link. This line has been under construction since 2019 and the expected finish date is in 2021.

3. Orange line is a heavy rail transit system which has an approximate length of 35.9 kilometers. 27 kilometers of the train line is constructed underground and another 8.9 kilometers is constructed on ground. This line starts from the uptown to the suburb of Bangkok. This line is also under construction and the expected finish date is in 2023.

As a result, you can see that, based on the stated information, there are lists of facilities around the property that should fulfill most of the requirements for its future customers. For example, let assume that this property would be developed into an apartment or an office, the future citizens who live or work in the building would not have to worry about the food and about their sickness at all since they are surrounded with department stores and hospitals. Furthermore, if you are a parent, you have at least 7 options to choose a school for your kids that are located close to your home or your workplace, and only 5 kilometers from the property, there are 3 train lines that go across the city, such as, downtown, suburb, and airport. Thus, the three rules that say that a location is the most important factor for real estate developers might be true in this case but it must be a location with the right business strategy. The next section will talk about the zoning restriction of Property-X.

7.2.3 Zoning/Area restriction

Many wonder why there are no high-rise buildings in rural areas, why there are no factories in urban areas. It is because each country's government has to make restrictions on

areas in a country to arrange each area properly. For example, they will separate an industrial area out of a city where there are houses and schools. Moreover, they do not let you build a high-rise building in the middle of nowhere. You can only build it in the chosen area where the government allows. Therefore, you have to check the area restriction of the chosen land before deciding the size and the height of your building. This is very important for real estate developers because if you do not study it well or even make a small mistake that is against the chosen area restriction, your brand new building could be shut downed by the government before even starting using it, so whatever the project is must not be against the area restriction. The study of the legalities of the chosen property area is required. Therefore, this section will focus on the land legal of Property-X.

CPD one stop service is the Thai government agency that is in charge of the area restriction all over Thailand. Their job is to make each area restrictions and update them to Thai citizens which also means that each area restrictions are always updated every 5 to 10 years. For example, the areas that are able to build a high-rise building would expand every year based on the population density growth in that area. In addition, there are 10 different categories of area restrictions and each specific category is differentiated by the color shows in the map that CPD one stop service provided, here is the definitions of each area colors,

Color		**Category**
Yellow		Residential with low density of population
Orange		Residential with medium density of population
Brown		Residential with high density of population

Red		Commercial residential
Purple		Industrial
Pink		Storage
Laver		Specific industrial
Green		Agricultural
Dark Green		Educational
Light Green		Conserve for indigenous people
Light Brown		Conserve for arts and cultural
Gray		Religion
Blue		Government

Table 6: Area Category

According to Table 6, it shows the definitions of each color. As you can see, yellow, orange, brown and red colors are residential areas where raw lands that are located in yellow areas are the cheapest and raw land that located in red areas are the most expensive due to the fact that the red areas allows real estate developers to build a high-rise building up to 40 or more floors depending on the size of the land, the width of the access roads, and any other requirements while the other color like brown, orange, and yellow allows developers less and less respectively. Moreover, purple, pink, and laver colors are industrial areas where the government allows businessmen or entrepreneurs to build huge storages, and factories with some extra privileges, such as reducing pollution tax for controlling factories out of residential areas. In addition, green, dark green, and light green areas could

be the least consideration but the most important areas for the citizens because those areas are the areas where the government allows farmers to grow crops, livestock without any disruptions from the noise pollution from the city and the toxic pollution from the factories. Last but not least, light brown, gray, and blue areas spread throughout the city by small areas. Its definitions are as it shows in Table 6 which are the area for conserving for arts and culture, religious, and government respectively (CPD.Bangkok, n.d.). Therefore, in order to decide what kind of project can be developed on the area that Property-X is located, you have to check the area restriction in that county. The next paragraph will talk about the area color of Property-X and what specific restrictions that Company-A has to follow.

7.2.3.1 Relevant restrictions of Property-X

In order to analyse this feasibility study as actual as possible, it requires the actual and the most recent restrictions of the area of the location of Property-X. As the result, from looking into the details of the area, it shows that Property-X is located in the orange area where there is a medium density of populations as it shows down below (CPD.Bangkok, n.d.).

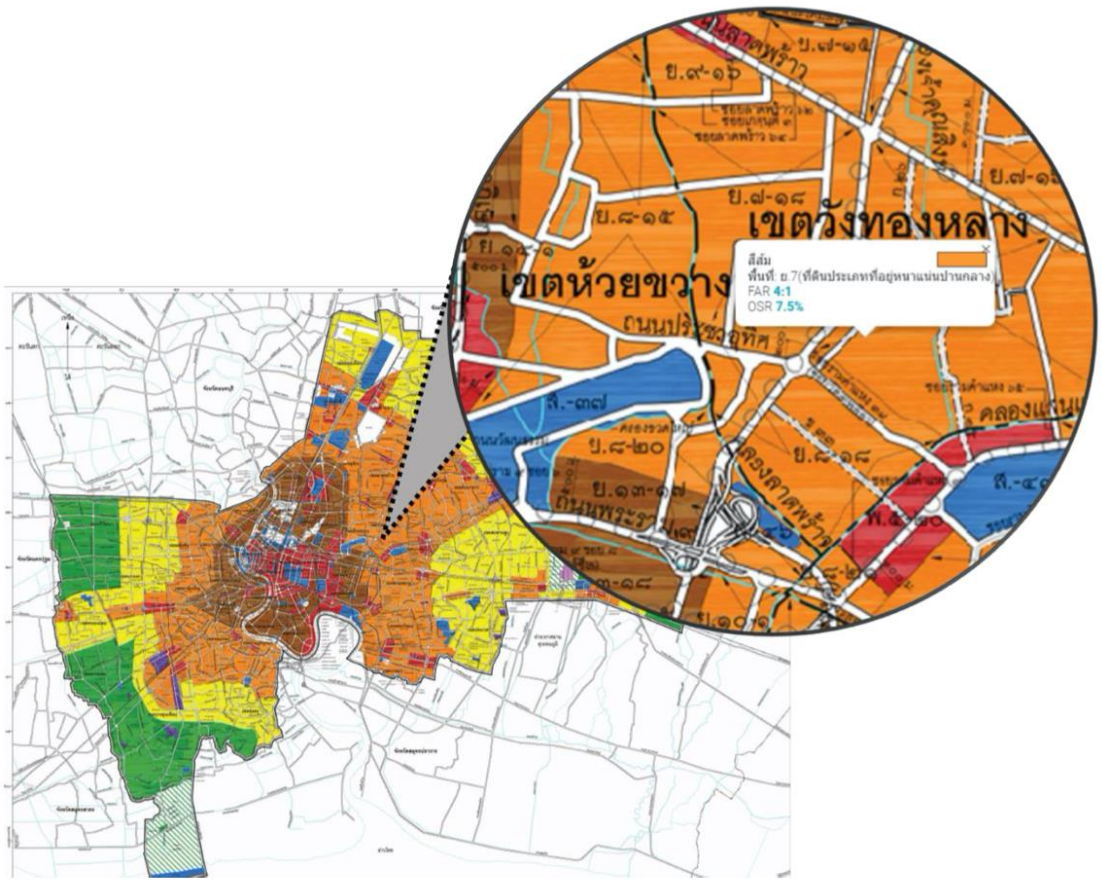


Figure 10: Bangkok Map

According to Figure 10, it shows all the different kinds of areas of Bangkok, Thailand. The big circle in the map is the zoomed picture area of Property-X county. You can see that most of the areas in the county are orange, nevertheless, it is very close to the brown areas which mean that there is a high possibility that this county would, one day, change from orange to brown. However, you never know the future, so this thesis would focus on the orange area restriction. As it shows in the zoomed picture, there are FAR & OSR ratios which FAR stand for "Floor Area Ratio" and OSR stand for "Open Space Ratio". It is the easiest way to roughly predict the size of the project you are going to do. These ratios are the ratios that

can calculate the maximum capacity of the building in the chosen land and how much open space in the building is required (Tooktee, 2019). Here are the calculations,

- FAR: let assume that there is 1,600 square meter raw land in the same area of Property-X which means that the FAR ratio equal to 4, so

Capacity of the expected building (Sq. meter) = FAR x size of the raw land in square meter

= 4 x 1,600 sq.m

= 6,400 sq.m

- OSR is to determine the open spaces in the building, so let use the information earlier to calculate. This area has OSR equal to 7.5%, so

Open space (sq.m) = OSR x Capacity of the building

= 7.5% x 6,400 sq.m

= 480 sq. m of open area

you can see that your expected project capacity could be up to 6,400 sq. m and out of the area, there must be 480 sq.m open space in the building, nonetheless, it is just a rough calculation. There are many more factors and restrictions to determine the size and the type of the building. Here, there are 8 general restrictions of the orange color areas (CPD.Bangkok, n.d.).

1. Cannot build a residential building that has a capacity more than 10,000 sq. m. that is close to the edge of the land. Unless, the access road of the land is at least 30 meters

wide or the land is within 500 meters from a public train station. However, in all cases, a building cannot be taller than 22 meters.

2. Cannot build a commercial building that has a capacity between 2,000 - 5,000 sq. m that is close to the edge of the land. Unless, the access road of the land is 16 meters wide or the land is within 650 meters from a public train station.
3. Cannot build a commercial building that has a capacity between 5,000 - 10,000 sq. m that is close to the edge of the land. Unless, the access road of the land is 30 meters wide or the land is within 500 meters from a public train station.
4. Cannot build an office building that has a capacity between 301 - 500 sq. m that is close to the edge of the land. Unless, the access road of the land is 12 meters wide or the land is within 800 meters from a public train station.
5. Cannot build an office building that has a capacity between 301 - 1,000 sq. m that is close to the edge of the land. Unless, the access road of the land is 12 meters wide or the land is within 800 meters from a public train station.
6. Cannot build an office building that has a capacity between 1,001 - 2,000 sq. m that is close to the edge of the land. Unless, the access road of the land is 16 meters wide or the land is within 650 meters from a public train station.
7. Cannot build a hotel that has numbers of rooms between 51 - 80 rooms. Unless, the access road of the hotel is 16 meters wide or the land is within 650 meters from a public train station.
8. Cannot build a hotel that has more than 81 rooms. Unless, the access road of the hotel is 30 meters wide or the land is within 500 meters from a public train station.

In addition, since Property-X is also located in the low-rise office area, it has some specific restrictions that has to follow as provided below (CPD.Bangkok, n.d.),

1. If the building has at most 3 floors, the building must be built at least 6 meters far from the edge of the land. If the building has more than 3 floors, there must be at least 12 meters far from the edge of the land. If there is a parking lot on the ground floor, the height from the ground to the ceiling must be at least 5 meters in between.
2. The maximum height of the building cannot exceed 15 meters and the usable area of the building cannot exceed 2,000 square meters.
3. Spaces between building to building
    a. If the height of the building is less than 9 meters, and another building next to it is also less than 9 meters, the space between 2 buildings must be at least 4 meters.
    b. If the height of the building is less than 9 meters, and another building next to it is higher than 9 meters but less than 23 meters, the space between 2 buildings must be at least 5 meters.
    c. If the height of the building is more than 9 meters but less than 23 meters, and another building next to it is also higher than 9 meters but less than 23 meters, the space between 2 buildings must be at least 6 meters.
4. Fire escape
    a. If the building has at most 4 floors or 15 meters high from the ground, there must be at least one stair.

b. If the building has more than 4 floors or a 3 floors building that has a rooftop deck area bigger than 16 square meters, there must be at least 2 stairs. One inside of the building and another one outside of the building.

As a result of analysing the location & the restrictions of the expected project, it concludes that Property-X is the best choice among the three potential assets of Company-A by taking many factors into account like the surroundings, infrastructure, transportation, and etc. Property-X earns 27 out of 30 while the others earn only 15 and 25 out of 30 which means that Property-X won the unanimous decision. In addition, the research shows that Property-X is located in the orange area which stands for a residential area with medium density of population. There are several restrictions that have to be followed as it stated. However, by all those restrictions, there are some restrictions that directly affect Property-X, especially the general restrictions number 4, 5, and 6, and all the specific restrictions from 1 to 4. You can see that even though the FAR ratio is 4 and the OSR ratio is 7.5% which can be predicted that the maximum capacity is;

Max Capacity = FAR x Area of Property-X (square meter)

= 4 x 1,880 sq. m

= 7,520 sq. m

, the capacity per one building cannot exceed 2,000 sq. m due to the general restriction number 6 and the specific restriction number 2. However, there is still a way to maximize the value and the capability of the land, for example, Company-A can split the land into 2 or more pieces. All this information will be used for the next sections to decide what type of

project is the best for Company-A for reducing risks, earning passive income, and having the shortest time to break even.

7.3 Business strategy of the chosen property

This section would analyse different kinds of analysis, such as, SWOT analysis, competitor analysis, and with the information from the location and restriction of the expected project section, it can determine what project would benefit Company-A the most, in other words, the project that is able to reduce the risks that Company-A faces. Let start with SWOT analysis

7.3.1 SWOT Analysis of the chosen property

This SWOT analysis, here, is to see the strengths, the weaknesses, the opportunities, and the threats of the real estate sector in Thailand. The main objective of this analysis is to help Company-A expand a full awareness of all the factors involved in choosing a type of project. This analysis allows you to see the real estate sector in four different kinds of angles. The SWOT analysis of Thai real estate market is presented as follows;

Strengths	Weaknesses
Overview: Thailand is a business hub of SouthEast Asian Countries which has many foreign investors and over 40 millions tourists in 2019	**Overview**: the supplies are greater than the demands, plus the downturn of the market & The uncertainty of the economy and the politics

Property-X's view: located in an office area close to malls and schools close to downtown convenient transportation	**Property-X's view**: the land is quite small & a new real estate developer requires efforts and time to gain customer trusts.
Opportunities	**Threats**
Overview: there are still tons of raw lands available to be developed & new policies benefit foreign investors **Property-X's view**: future train lines -> lead to rise in land price & changed in area restriction -> increase in the value and the price of the land	**Overview**: Covid19 pandemic. US & China trade war. lack of Thai labors. Thai currency appreciates -> foreigners delay their investments. **Property-X's view**: too crowded, hard to find a parking lot .

Table 7: Property-X's SWOT

According to Table 7, it shows the SWOT analysis of Property-X in the overviews of the real estate sector and Property-X itself.

Strengths

Overview: as mentioned in PEST earlier, Thailand is located in the middle of Southeast Asia which gives Thailand a competitive advantage in terms of business and travel. Many foreign investors use Thailand as a business hub before spreading its products or

services to other Southeast Asian countries. Moreover, the number of foreign tourists in Thailand has been increasing every year. In 2019, there were around 40 million foreign tourists that come to Thailand which make a huge circulating fund in all business sectors, especially in tourism and real estate business. By this information, it can roughly calculate that if there are 40 million tourists, the number of hotel rooms sold must be more than that since each tourist might stay more than 1 night. According to Thaiwebsites, it shows that each tourist spent about 50,000 Thai Baht in Thailand trip, so by multiplying the number with the number of the tourists in 2019. It shows that Thailand can create about 2 trillion Thai Baht of revenue by the foreign tourists alone.

Property-X's view: you can see that the strengths of this property is it is located in a strategic area where it is surrounded with many offices, houses and the facilities like departments stores, hospitals and public transportations which shows that this area already has its demand and already surrounded with many types of people like business owners, employees, students, and etc. Moreover, it is easy to reach the property since there are three roads around the property, and it takes only 14 kilometers to get to downtown.

Weaknesses

Overview: the supplies are greater than the demands, plus the downturn of the market. Years earlier, there was a boom in the real estate market. The charm of the real estate market at the time pulled many riches, and investors from all kinds of other businesses came to test the feeling of being a real estate owner. Owning a village, or a building was not so hard at the time since there was a huge demand waiting for them and because of this, the investors kept investing in new projects on and on, until there were tons

of real estate projects everywhere, especially in the downtown, so now the power shipped from the supply to the demand. The customers, at the time, had so many options to choose which forced the investors to do pricing strategy. Those that can manage their cost and can sell low prices survive, while others try not to die. As a result, the real estate market dropped to the lowest point in 2019. Moreover, the uncertainty of the economy and the politics, in Thailand, have always been with Thai people for decades. Some of the plans of improving the infrastructures, all around the country, have been disrupted and delayed for a long time which has bad effects to the real estate sector in many ways.

Property-X's view: there are some weaknesses by the same reason for the strength since the property is located in the prime area, there might be many experienced real estate developers who might see this area as the same as this study sees and starting investing in this area, and become Company-A's competitors and since Company-A has only 470 square wahs in the area, it quite miss an opportunity to create something bigger and since Company-A was not yet recognized as a real estate developer, it might take some effort and time to be trusted since most people also consider branding.

Opportunities

Overview: The government has been trying to make Thailand as a business hub of Southeast Asia which came up with many policies that give benefits to expats and foreigners to attract them to come to live, travel, and invest in Thailand. As a developing country, opportunities are everywhere waiting for someone to be seen and taken since there are numbers of raw lands and things waiting to be developed.

Property-X's view: the government has already approved the project of the new 13 train lines across the Bangkok city. Fortunately, the property is surrounded with the three of them within 5 kilometers. Due to the improvements of the surrounding area in both living facilities and infrastructures, it tends to increase the value of the property organically throughout the years. Moreover, the high density area restriction would expand every year following the new infrastructures of the city and if the area restriction color changes to higher density, the price and the value of the land will dramatically increase. In the worst case scenario, if the expected project fails, the raw-land alone already makes huge profits by itself since the company had bought the land for more than 30 years which makes it a sunk cost of the company.

Threats

Overview: the real estate market in Thailand has been disrupted by many factors like the economic recession caused by Covid-19 pandemic, and the trade war between the US and China that made huge fluctuations in both the money market and the stock market in Thailand. The Thai currency has appreciated to its peak at the end of 2019 which made foreign investors delay investing in the Thai businesses like tourism, industrials, and real estates. Many foreign factories and companies had to move their production lines to other countries like Vietnam, Myanma, Cambodia, and Indonesia due to the rise in the minimum wage rate in Thailand, it made those countries have much lower cost in manpower to the investors and It surely has negative effects to Thai labor. In addition, these days Thai people do not want to work as a construction labor anymore. They either choose to work in an office or a freelance job which makes it very difficult for Thai construction companies to find skilled labor, and most of the time, they have to import laborers from the neighborhood

countries. In addition, 2020 is another year from 2019 that Thai investors have to adapt to these negative factors even though Thai government came up with many stimulus policies to help them.

Property-X's view: the area is too crowded in the rush hours, so it is hard to find a parking lot and it might be one of the requirements that the future customers might consider. Thus, to solve the problem, the company might need to cut some of the land areas to be a parking lot which would make the usable area even smaller.

To decide what type of a project would be the most suitable for the area, studying the expected customers and the expected competitors is a must. Therefore, the next section will be about the future competitors.

7.3.2 Competitors & Demands

Knowing about your competitors is one of the key success factors in any business. This section will focus on future competitors of Property-X's future project by collecting data from the surrounding projects like offices and apartments. The collected data, in this feasibility, will be public information that can be found publicly in real estate brokers and/or in real estate market websites and this research would only focus on rental projects since the goal of this research is to increase the stability of Company-A. The data will include locations, style, floor numbers, function, usable area, rental price, rental price per one square meter, sell rate, customer target, and facilities. These data will be a guideline for the company to decide on its own project. Let's start with the location of the competitors.

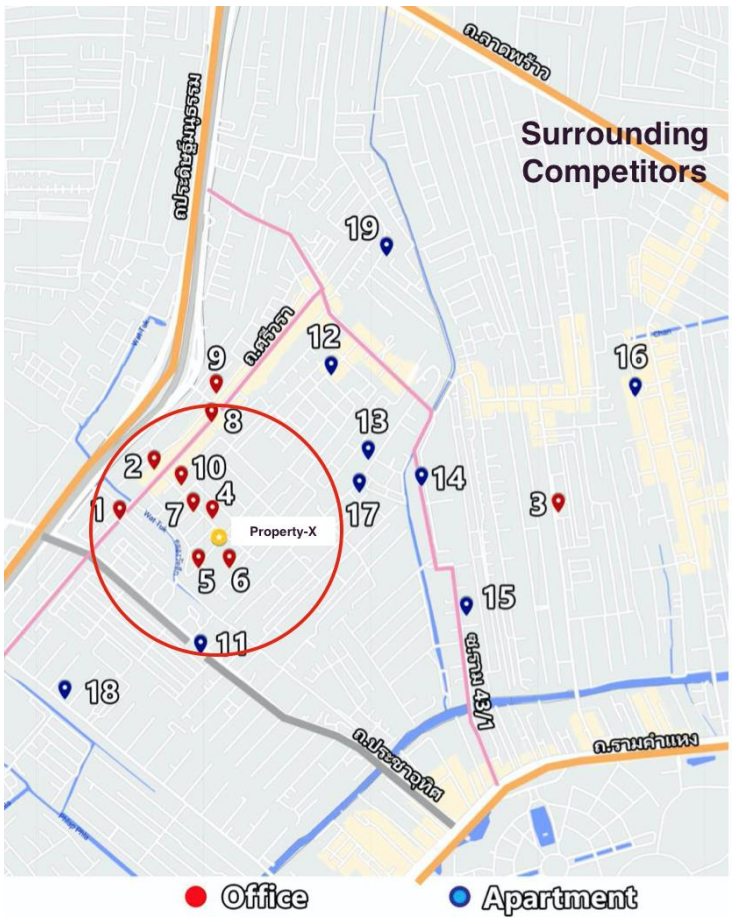


Figure 11: The Surrounding Competitors

As you can see in Figure 11, there are many offices for rent and apartments around the area that Property-X is located. The red icons represent the location of offices and the blue icons represent the location of apartments. There are 10 offices and 9 apartments around the area that provide data publicly. As you can see in the red circle, it shows that within 1 kilometer of Property-X, there are a lot of offices for rent which show that this area is quite a popular place for entrepreneurs who look for an office. Whereas, the apartments tend to be farther away from the property which having an apartment in the circle might be a solution for the employees who look for a place to live around there. The table below will show the details of each building.

7.3.2.1 Office

The Surrounding Offices Information										
No.	**Name**	**Number of Floor**	**Rental Style**	**Function per One Building**	**Usable Area SQ .M**	**Monthly Fee**	**Price per Sq. m**	**Rental Rate**	**Their Customers**	**Facility**
1	Office 1	4	whole building	7 toilets, 6 parking lots	490	150,000.00	306	N.D.	Beauty Clinic, IT Offices	security guards, private lift
2	Office 2	4	whole building	share common area with a huge parking lot	200	55,000.00	275	N.D.	Grocery Stores, Restaurants	security guards & cams, garden
3	Office 3	4	whole building & partly	3 rooms, 3 toilets, 2 parking lots	250	40,000.00	160	90%	Creative Offices, Production studios	security guards
4	Office 4	4	whole building	4 toilets, 10 parking lots	130	30,000.00	231	90%	Real estate office, Media offices	none
5	Office 5	4	floor by floor	share common area with a huge parking lot	120	35,000.00	292	95%	Event Organizers	security guards
6	Office 6 (under construction)	4	whole building	half office, half storage	609	200,000.00	329	30%	Exporting Companies	security guards
7	Office 7	3	whole building	10 rooms, 5 toilets	1,200	350,000.00	292	N.D.	Creative Offices, Production studios	none
8	Office 8	3	whole building & partly	share common area, and a huge parking lot	200	65,000.00	325	90%	Restaurants	private lift
9	Office 9	4	whole building	4 toilets, 5 parking lots	753	270,000.00	359	N.D.	N.D.	private lift
10	Office 10	4	whole building	4 toilets, 5 parking lots	1,400	250,000.00	179	N.D.	N.D.	none

Table 8: The Surrounding Offices Information

According to Table 8, it shows the information of the chosen surrounding offices that mentioned earlier. The information includes the names of each project which would call in this research "Project + a number" as it shows, numbers of floors, function, usable area, monthly fee, rental price per one square meter, rental rate, their current clients, and provided facilities. The number of each office is related to the shown number in Figure 11.

From the information, the first thing that can be confirmed is the relevant restrictions in the earlier section right. Based on the specific restriction number 2, it says that the buildings in the area cannot be higher than 15 meters which shows in Table 8 that the maximum number of floors of the buildings in the area is 4 and by dividing 4 to 15, it shows that the average floor height is around 3.75 meters which is very reasonable and it also says that the usable

area of a building cannot exceed 2,000 square meters which also apply here. The styles and the functions of all the projects are pretty similar since all of them are office buildings for rent. It is a common thing for the office owner to provide at least toilets and parking lots for renters. The next one is usable area, usable area is one of the consideration factors for renters since the size of the office has to relate to the type of the business of the renters. As you can see, there are several options for renters since there are a variety of sizes of the office in the area. Nevertheless, what could be the most important consideration factor for renters is the rental price. As you can see, you have to compare between the monthly fee and the price per one square meter since you have to rent the whole building for most of the provided projects in the area, except Office 3, 5, and 8 that you can rent it party or floor by floor. The renters have to weigh between the size of the building and the necessity of space by themselves. One thing you can conclude from the information of the rental price per one square meter is that the prices do not always relate to the size of the buildings since the rental prices per one square meter of the provided buildings are random. Most of the time the rental price per one square meter should be lower if the usable area is bigger. However, the outstanding rental price is Office 3, and Office 10 since the average price is way lower than their competitors, nonetheless, one thing that is missing from the table is the condition of each building. There must be a reason for the low price, for example, the condition inside the building could be very bad and requires a lot of maintenance. Lastly, the table shows that there are definitely demands in the area since some of them show the rental rate of their projects. They show that about 90% of their projects have already been rented in a long term contract. Moreover, even though Office 6 is under construction, 30% of the area is already reserved.

7.3.2.2 Apartment

The Surrounding Apartments Information											
No.	Name	Number of Floor	Number of room	Style	Room size (Sq. m)	Monthly Fee	Daily Fee	Rental Price per one SQ. M	Rental Rate	Facilities	Provided Equipments
11	Apartment 11	7	130	studio	26	5,600	-	215	70%	security guards & cams, keycard, WIFI, cable TV	fully furnished
				suit	40	8,400	-	210			
12	Apartment 12	7	215	one bed	36	8,000	1,000	222	80%	swimming pool, fitness, security guards & cams, WIFI	fully furnished
13	Apartment 13	7	140	studio	20	4,320	-	216	90%	lift, washing machine, security guards, WIFI	fully furnished
14	Apartment 14	7	150	one bed	32	5,000	-	156	70%	washing machine, security guards, WIFI	fully furnished
15	Apartment 15	5	75	superior	26	4,000	-	154	95%	lift, washing machine, security guards, WIFI	fully furnished
				deluxe	30	5,200	-	173			
				villa	32	5,600	-	175			
				daily	35	-	750	21			
16	Apartment 16	7	224	studio	26	8,000	900	308	50%	swimming pool, fitness, lift, washing machine, security guards, WIFI	fully furnished
				one bed	45	15,000	-	333			
				two bed	60	18,000	-	300			
17	Apartment 17	5	76	one bed	24	5,500	-	229	70%	security guards & cams	fully furnished
18	Apartment 18	4	19	one bed	50	15,000	-	300	85%	room service, fitness, security guards & cams	fully furnished
19	Apartment 19	4	40	studio	27	3,000	-	111	75%	keycard, security guards & cams	fully furnished
				two bed	54	6,000	-	111			

Table 9: The Surrounding Apartment Information

According to Table 9, it shows the information of the apartment around the area. The currency is in Thai Baht. The names of each apartment is related to the resented locations that show in Figure 11. As you see in Figure 11, all the apartments are at least 1 kilometer far away from Property-X which the stated specific restrictions in the earlier section do not apply to these apartments. However, they are still in the orange area where the buildings still need to follow the general restrictions, especially the general restriction number one in this case. The restriction says that you can only build a building that has a usable area more than 10,000 sq. m only if the access road is wider than 30 meters, and no matter what the building cannot be taller than 22 meters. Therefore, as you can see Table 9, most of the apartments have 7 floors, and some have 5 or 4 floors, this is due to the size of the raw land. The building in a smaller land tends to have more floors while the building in a bigger land tends to have less floor. In addition, it shows that some of the apartments have

more than 1 style to choose, such as, studio, one bedroom, two bedrooms, and etc. These could be either good or bad at the same time depending on the marketing and customer targets of each apartment. Apartment 15 is the winner in terms of rental rate. It shows that 95% of its rooms have been rented and it quite makes sense if you see at the rental price per one square meter of all the types of the rooms. They are very cheap while still giving you quite a full options of facilities compared with the others. Unlike the office building, people in the area could be looking for a budget place to live since most of them are employees who work in the area. Based on the data, 200 Thai baht per one square meter could probably be the most suitable price for this area.

To sum up, based on the research, Property-X could be developed to be either an apartment or offices for rent since there are demands for both projects in the area. The research shows that the area has a high potential due to the fact that it is close to the downtown and has many facilities around the area like department stores, hospitals, schools, and etc. Moreover, there will be 3 new train lines across the area which will surely increase demands and values of the property. In conclusion, it shows that

- Office: most of the rental rates of the offices around the area are at least 90% and the most suitable price and affordable price should be between 200 - 375 Thai Baht per one sq. m.
- Apartment: the rental rates of the apartments around the area are about 70% - 90%. The monthly fee is between 4,000 - 8,000 Thai Baht per room or around 150 - 300 Thai Baht per one sq. m.

This data will be necessary and used for the feasibility study section in the next section.

8. Feasibility Studies

To see the result of the integration, feasibility studies would be one of the best ways to confirm that the method really works. The result of this feasibility study would help Company-A to decide to integrate to real estate or not and how the integration would decrease or increase the risks that the company is facing.

This section will do feasibility studies of both apartment and office projects. The feasibility study will include draft layouts that are based on the study of the area restrictions, construction cost & a master plan, and the financial analysis that based on the collected data of both projects to see which project has fit this vertical integration better by analysing from the passive turnover, and the breakeven times. Finally, a result of this section will be used in the next section that would combine a construction company with a real estate company to see if the vertical integration in a construction company works or not.

8.1 Project Layouts

A layout of a real estate project is something that someone might not pay so much attention to because if they just wanted to build a shop, a restaurant, or a house, they did not need to use the full capacity of the area since the bigger the building, the higher the cost of construction. However, a layout of a project is actually very important for every real estate developer because in order to earn maximum profit out of the land, they must maximize the capacity of every inch of the land based on the restriction area. In other words, the more the

usable area, the better the income. Therefore, according to the general restrictions and the specific restrictions that say that

1. 3 floors buildings must be built at least 6 meters far from the edge of the land. More than 3 floors buildings must be built at least 12 meters far from the edge of the land.
2. Building cannot exceed 15 meters tall and the usable area of the building cannot exceed 2,000 square meters.
3. and there are some specific spaces between one building to another.

Based on the specific restriction number 2 that says that the usable area of a building cannot exceed 2,000 sq.m, so in order to maximize value of the land, the land must be divided into 2 or more pieces. Here, there are three potential options since there are three access roads around Property-X which has 16 meters wide on the top, 10 meters wide on the left, and 12 meters wide on the right which fulfil all the requirements of the general restrictions.

Therefore, in order to maximize the capability of the usable area of the project, let's assume that both apartment and office have a very similar layout of a building. the three possible options are presented as followed:

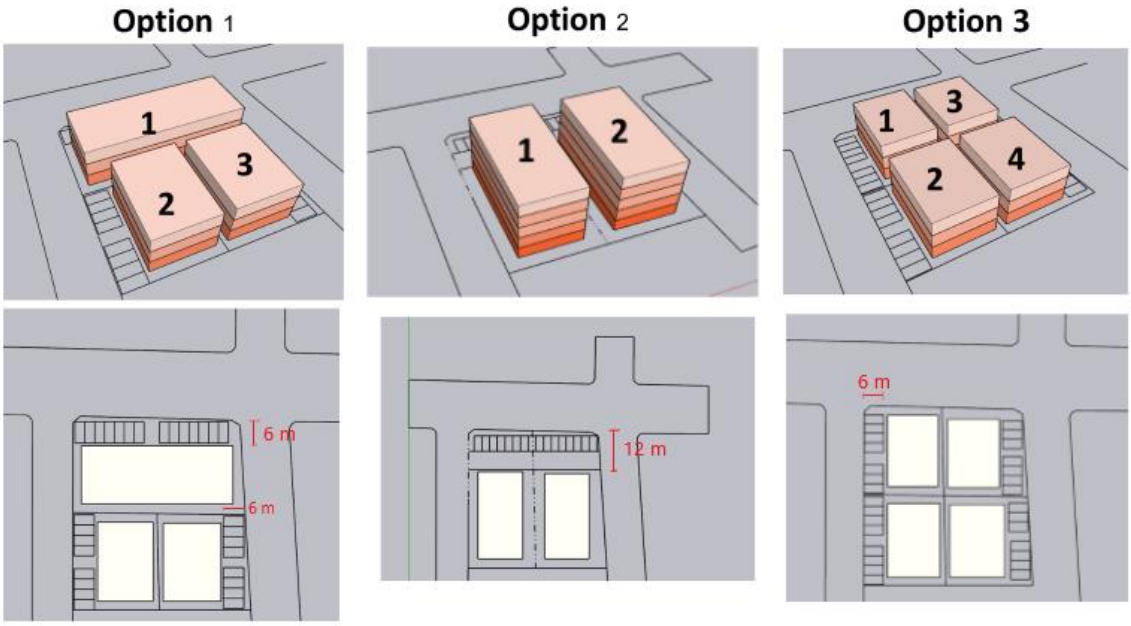


Figure 12: layouts

Option 1

According to Figure 12, option 1 divided the land to three pieces individually, as you can see, which each of them has its own parking lots that has 6 meters wide, so based on the specific restriction number 1, the buildings can have at most 3 floors. By calculating the area of each building from calculated the amount of the area in the square time the number of the floors, it shows that the building 1 has 1,510.50 sq.m of usable area, the building 2 has 753.22 sq. m of usable area, and the building 3 has 772.96 sq.m of usable area. Thus, the overall usable area is 3,036.68 sq.m.

Option 2

From the result of option 1, it shows that the biggest constraint is actually the limitation of the number of the floors due to the length from the edge of the land to the buildings is only 6 meters. Therefore, to have more than 3 floors, there must be at least 12 meters between the edge of the land and the buildings. As a result, from option 1, option 2

has to sacrifice some spaces of the land to be parking lots or a garden to fulfill the requirement, as you can see in figure 12. Here, the land is divided into 2 pieces and each of them has 5 floors which the building 1 has 1,985.44 sq.m of usable area and the building 2 has 1,956.89 sq.m of usable area. Thus, the overall usable area is 3,942.33 sq.m.

Option 3

Last but at least, after trying to divide the land into 2 and 3 pieces, the results came out satisfactory since there was a significant difference between them. Therefore, the question is what if the land is divided into 4 pieces and use the left and the right access roads as the main roads. As a result, it is found that the floor limitation restriction has a huge impact on usable areas. Option 3's total usable areas is even smaller than option 1 since there was a restriction about spaces between building to building. Here, the building 1 has 704.64 sq.m of usable areas, building 2 has 752.29 sq.m of useable area, building 3 has 697.92 sq.m of usable area, and building 4 has 773.26 sq.m of usable area. Thus, the overall usable area is 2,928.11 sq.m which is the smallest among them.

As a result, option 2 layout can produce the most usable areas out of the land since it has about 1 thousand square meters of usable area more than the other two options which is decided to be used as a case study layout for both office and apartment projects. Draft perspectives of the buildings are shown in Figure 13 down below:

Figure 13: Draft Perspectives

8.2 Construction Cost & Plan

This section will focus on the cost of construction of the chosen building layout in the previous section and a draft construction plan of the project. The plan includes a master schedule of the project, and machinery schedule which are necessary for better estimating the cost of the project since the length of the project, and the number of machines would have a direct effect on the cost of construction. Therefore, the estimated cost would be from the plan, and the average cost of construction of the relevant projects that Company-A used to offer to clients.

8.2.1 Construction Plan

A construction plan is very important for both real estate developers and contractors to know what to do during a project like to track processes of the project and to know the deadlines of each part and process. It is a lot easier to track critical paths to forecast future obstacles and to prevent it before time. Moreover, the plan of the project will have direct effects on the cost of construction. For example, if it is a fast track project that requires a short length of time, it would require more costs on machines and manpower, on the other hand, if it is a long length project, it would have to leave both the machines and the staffs have to standby there for a long time which would lose opportunities to do another project. Therefore, the construction plan, here, includes the master schedule, and machinery schedule of the project to find the optimal points for the length, the number of machines.

8.2.1.1 Master Schedule

The master schedule, here, would show the processes of the construction in detail which will separate into four parts which are preliminary works, structural works, architectural works, and mechanical & electrical works.

Item	Description	Duration	1				2				3				4				5				6				7				8				9			
			W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
	OPTION 2 LAYOUT	**273**																																				
1	**Preliminary Work**																																					
1.1	Mobilization	14																																				
2	**Structural Works**	**126**																																				
2.1	Bore Pile	30																																				
2.2	Foundation	30																																				
2.3	1 st Floor	24																																				
2.4	2 nd Floor	15																																				
2.5	3 rd Floor	15																																				
2.6	4 th Floor	15																																				
2.7	5 th Floor	15																																				
2.8	Roof	15																																				
3	**Architectural Works**	**176**																																				
3.1	Wall and Partition Works	45																																				
3.2	Floor Finish Works	45																																				
3.3	Ceiling Works	45																																				
3.4	Door & Window Works	50																																				
3.5	Sanitary Fixtures and Accessories	35																																				
3.6	Painting Works	100																																				
3.7	Staircase and Handrail Works	40																																				
3.8	Miscellinious Works	55																																				
3.9	Cleaning Works	30																																				
4	**M&E Works**	**159**																																				
4.1	Sanitary Works	75																																				
4.2	Electrical Works	90																																				
4.3	Air Condition Works	75																																				
4.4	Lift Works	30																																				
4.5	Completioning Test	30																																				
	Total																																				

Table 10: Master Schedule

According to Table 10, it shows the master schedule of the construction of the building layout in the previous section. You can see that there are 4 big parts of the construction which are preliminary works, structural works, architectural works, and M&E works. The preliminary works, here, are the indirect works in the construction site before and during the project, such as, site mobilization, site labor camps, site machineries, site equipment, site transportations, site safety, site utilities, and etc. Some might wonder why the site machineries and the site equipment are indirect cost, it is because those are the construction company's assets which can be reused in other projects. As a result, the preliminary works are in every part of the processes from the beginning until the end of the project. The second process is the structural works which begin with piling works, foundation works, beams, columns, and floors works, and the roof work respectively. The first floor would take about 21 days or about 3 weeks to be built since there are 2 buildings and formworks and table forms need to be assembled in this floor, and those can be reused for the rest of the floors. From the second floor to the roof takes only 14 days each floor to

be built. Therefore, the structural works take 126 days or about 5 months, as you can see in the table. The third process is architectural works. This process usually requires more time and money to do since it requires skilled workers and/or professionals to do it, especially the floor finishing works, door & windows works, and painting works which most of the time would be troublesome when delivered to clients. Here, the wall and the partition works can be started right after finishing constructing the third floor structure due to the standard safety. There must be 2 floors in between since the concrete requires time to fully activate the strength. After the wall and the partition works, the workers, now, can start the floor finishing works, ceiling works, door & window works, and accessories works respectively. The painting works include both internal and external paint of the buildings which would take about 20 days each floor, so to finish the whole buildings, it requires 100 days since this process requires skilled workers to do it because this process is like the skin of the buildings if they are not smooth, the client will likely force you to fix it again and again. Including the staircase works, the handrail works, the miscellaneous works, and the final cleaning works, the total length of architectural work is 176 days or about 6 months. Last but not least, the electrical & the mechanical works have to be started about the same time with the architectural works since there are many kinds of sleeves that have to be assembled in the walls and/ or above the ceilings, such as, electrical pipe sleeves, water pipe sleeves, and air condition sleeves. In total, it shows that the optimal length of the construction for the project is 273 days or about 9 months. Here, the question is why the time length of the project affects the price of the construction. The reason is that it affects the number of machines and works. The next section will have a prediction of the machines & equipment schedule based on the master schedule.

8.2.1.2 Machine & Equipment Schedule

This section will analyse the necessary machines and the necessary equipment that should have on each process of the construction based on the master schedule in the previous section since these machines and equipment will be one of the costs in the preliminary works, so to have the most accurate prediction, this section is very helpful. To be able to apply to Company-A's policy, all the machines and most of the equipment have to be outsourced or rented in order to be lean as possible.

Item	Description	1				2				3				4				5				6				7				8				9			
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
	OPTION 2 LAYOUT																																				
	Machine & Equipment																																				
1	Bore Pile			2	2	2	2																														
2	Mobile Crane	1	1	1	1																																
3	Tower Crane					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										
4	Backhole	1	1	2	2	2	2	2	2	2	2																										
5	Truck			2	2	2	2	2	2	2	2																										
6	Generator	1	1	1	1																																
7	Welding Carbinet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
8	Steel Cutting&Bending Machine					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																
9	Concrete Pendant.					4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4																
10	Mortar Mixer													4	4	4	4	4	4	4	4	4															
11	Pump	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
12	Jack & Drill	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
13	Other																																				
	รวมทั้งหมด	**9**	**9**	**14**	**14**	**19**	**19**	**17**	**17**	**17**	**17**	**13**	**13**	**13**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**11**	**7**	**7**	**7**	**7**	**7**	**6**	**6**	**6**	**6**	**4**	**4**	**2**	**2**	**2**	**2**

Table 11: Machines & Equipment Schedule

According to Table 11, it shows all the necessary machines and equipment on each process based on the master schedule. It shows that in the first month of the project, there must be at least 1 mobile crane, 1 backhoe, 1 electric generator, 2 welding cabinets, 2 pumps, and 1 each jack & drill. As one knows, pumps, jacks and drills are the basic equipment that are useful for multi purposes, for example, a pump can be a generator for many other equipment like a water jet gun, a nail gun, and etc. Therefore, this equipment would be needed since the beginning for the project. The mobile crane and the backhoe are for preparing the site layout for the construction by moving raw materials in places, and grading ground. The generator is usually needed for the very first month of the construction only because it takes some time to do some documents to ask for temporary utilities in the

construction site. Based on the master schedule, piling works start in the 3 week of the first month, so each building would have 1 piling machine to do the work and predicted to finish all in 30 days. By the time, the tower crane can be assembled since it has to be on the piles and it is cheaper and more compact than the mobile crane. As you can see in the table, it shows that the peak of the usage of the machines, and the equipment is in between the first month and the fifth month which is the structural work since the architectural works and M&E works for a building project do not require a huge machine. By the numbers of each machine and equipment shown in Table 11, they can be converted to the cost of rental that will later be distributed to both preliminary cost and structural cost. The next section will be the summary of the construction cost of the chosen type of building.

8.2.2 Construction Cost

Cost of construction is one of the biggest factors that determines whether a landowner would develop the land to something or not because many landowners got land heritages from their parents who bought the lands when the price of the lands were very cheap as their assets and when they heritage to their kids, the inheritors do not have enough money and knowledge to develop it. Therefore, they, most of the time, choose to sell them to real estate developers since it costs no risk and also due to the reason that a cost of construction is usually more expensive than the cost of its raw land, except if the land is in a prime area and its project size is unmatched to the area of the land. Nevertheless, in this case, the cost of the construction of either apartments or offices will surely be more expensive than the price of the raw land of Property-X. The cost estimate of the chosen building is shown as follows,

The preliminary costs include many indirect costs, for example, machinery & equipment rental costs, operation costs and etc that are mentioned earlier. The details show as follows,

Preliminary						
		Num	Q'TY	Unit	Price	Total
Machinery & Equipment	Cranes + gas	1	7	month	200,000	1,400,000
	Backhoe + gas	2	2	month	150,000	600,000
	Trucks + gas	2	2	month	150,000	600,000
	Equipment	1	9	month	100,000	900,000
					Sum machinery and equipment	3,500,000
Site Operation Cost	Labor camp rental	1	9	month	100,000	900,000
	labor camp & site utilities	1	9	month	120,000	1,080,000
	Temporary site office & doc	1	9	month	60,000	540,000
	Staff Overtime	1	9	month	50,000	450,000
	etc.	1	1	LS	91,007	91,007
					Sum Site Operation Cost	3,061,007
Head Office Operation Cost	About 10 % of the Total Revenue	1	1	LS	7,884,660	7,884,660
					Sum Head Office Operation Cost	7,884,660
					SUM TOTAL	14,445,667

Table 12: Preliminary

According to Table 12, it shows the preliminary costs of the chosen project in detail. As you can see, the biggest part of the preliminary cost is the head office operation cost which is about 10% of the total revenue of each project based on Table 1 in the very first section. The second biggest cost is the machinery and equipment rental cost due to the fact a machine like a crane or a backhoe requires gas and the machine has to be filled with the gas every day and the sum up cost of the gas in one month is about the same as the monthly rental cost of its machine. Last but not least, the site operation cost is also mandatory to every project as you can see in the table. The workers need a place to stay during a project and you definitely cannot deny the utilities bill or the cost of the document that you have to

do with the project owner. As a result, the total preliminary cost sum up to 14,445,667.00 Thai Baht.

The direct cost of the construction includes structural cost, architectural cost, mechanical cost, and electrical cost as shown as follows.

ITEM	DESCRIPTION	Q'TY	UNIT	MATERIAL		LABOUR		TOTAL AMOUT
				UNIT	TOTAL	UNIT	TOTAL	
A	Preliminary Costs	1.00	L.S.					14,445,667.00
B	Structural Costs	1.00	L.S.					15,243,697.00
C	Architectural Costs	1.00	L.S.					20,203,989.00
D	Sanitary Costs	1.00	L.S.					2,430,464.90
E	Electrical Costs	1.00	L.S.					5,286,945.00
F	Air Condition Costs	1.00	L.S.					6,900,092.00
	Sub Total							64,510,854.90
	Overhead & Profit	10%						6,451,085
	Total							70,961,940

Table 13: Construction Cost

According to Table 13, it shows the total cost of construction of the chosen building which is divided into 6 parts which are preliminary cost, structural cost, architectural cost, sanitary cost, electrical cost, and air condition cost which all combined plus 10% profit resulting in 70,961,940.00 Thai Baht which is about 18,000 Thai Baht per one sq.m of the chosen layout of the building area.

8.3 Feasibility Study

This section will do feasibility studies of each project by using all the information and data gathered from the previous sections since "Location & restriction of the expected project" to "construction cost & plan". Since both apartments and office projects are long-

term investment projects, the faster the break-even time is the better the project. Moreover, even though Property-X is Company-A's asset and the company would construct the project by itself, the feasibility studies would still include the price of the raw land of Property-X and the overhead profit from the construction in order to see the differences between when you operate a real estate company alone and when you vertically integrate a construction company to real-estate company. Therefore, let's start with the feasibility study of apartments.

8.3.1 Feasibility Study of Apartments

Apartment

Total Building Area	Rental/usable Area	%	Common Area	%	Parking Lots
3,942	2,718	69%	1,224	31%	more than 16

Table 14: Apartment layout and information

According to Table 14, it shows that the total area of the apartment building is 3,942 sq. m, nevertheless, the rental area or the usable area of the building is just 2,718 sq. m due to the fact that there are areas that have to be common areas like walkways, stairs, and lobbies. Moreover, there are 2 sizes of apartment rooms which are 45 sq.m and 47 sq.m because the size of the rooms has to be adjusted based on the left areas that already have stairs, lobbies and MBD rooms for maintenancing electrical and mechanical systems in every floor. Therefore, based on Table 9 that shows the data of the surrounding apartments around Property-X and combining with the chosen layout, it can make an assumption that:

Income

Feasibility Study of Apartments Project

	List	Quantity	Unit	Amount	Unit		
1	**Revenue**						
	Year 1		1	75%	rental rate		
	Year 2		2	80%	rental rate		
	Year 3		3	90%	rental rate		
	Year 4		4	100%	rental rate		
	Year 5 & So on		5	100%	rental rate		
	Type 1 room (45 sq. m)	6	room	13,500	monthly (Baht)	300 Baht / sq.m	
	Type 2 room (47 sq. m)	52	room	14,100	monthly (Baht)	300 Baht / sq.m	
	Type 3 room (-)		room				
	Parking Lots	23	car				
	Rental feen growth rate			3%	every 3 years		
2	**Other revenue**						
	other revenue			3.50%	from total revenue		
	- selling food and beverage						
	- public washing machines						
	- etc.						

Table 15: Apartment Income

According to Table 15, it shows all the aspects of the expected incomes based on the collected data. Here, you can assume that about 75 percent of the rooms are booked in the first year, and in the second and third year the rental rate increases to 80 percent and 90 percent respectively. Finally, in the fourth year and so on, the rental rate of the apartment is expected to hit about 100 percent. In addition, there are 2 types of rooms as mentioned.

Type 1 has only 6 rooms which each room has 45 sq. m of usable area, and the expected rental price is 13,500 Thai Baht per month which is about 300 Thai Baht per one square meter. The fee, as you can see, is quite high in the area compared with others due to the reason that it will be a brand new apartment, and there are new train lines that will be ready to use in a few years and the customer target of this apartment is expected to be A to B classes who will be provided with needed facilities in the future like electric car chargers, a shuttle bus to the nearest train station, and etc. Whereas, Type 2 has 52 rooms which each room has 47 sq. m of usable area and the monthly fee is 14,100 Thai Baht which the fee rate per one square meter is set to be the same as type 1. Therefore, you can make an assumption that if the rental rate is 100 percent, the total revenue of the rental fee, times the 3.5 percent of the indirect incomes is

$\big(((6 \times 13{,}500) + (52 \times 14{,}100)) \times 1.035\%\big) \times 12 = 10{,}112{,}364.00$ Thai Baht annually.

Moreover, the rental fee will increase about 3% every three years which is a common rate for apartments in the city.

Hard Costs

	List	Quantity	Unit	Amount	Unit	sum	
3	**Project cost and budget**						
	Cost of raw-land	469	Sq. wah	100,000	Baht per Sq. wah	46,900,000	Baht
	Cost of construction	3,942	Sq. m	18,000	Baht per Sq. m	70,961,940	Baht
	Infrastructure	0	Sq. m	0	Baht per Sq. m	0	Baht
	Interior			10,000	Baht per room	580,000	Baht
	Electrical appliances			15,000	Baht per room	870,000	Baht
	Architectural design fee			3%	Total project value	2,128,858	Baht
	EIA fee			0	Bath	0	Baht
	Official documents fee			1%	Total project value	709,619	Baht
	Total project cost and budget					**122,150,418**	**Baht**

Table 16: Apartment Hard Costs

According to Table 16, it shows the hard costs of the project, such as, cost of the raw land, and the cost of the construction that are gathered in the previous sections. As mentioned earlier in "location and restriction of the expected project" section, the total area of Property-X is 468 square wahs, and the average raw land price in the area is about 100,000 Thai Baht, so the whole area alone cost about 46 million Thai Baht. Plus, the total cost of the construction of the chosen layout is 70,961,940 Thai Baht as shown in the "Construction Cost" section, and also plus the other costs like interior and electrical appliances equal to 122,150,418.00 Thai Bath as a result.

Soft Costs

	List	Quantity	Unit	Amount	Unit	sum	
4	**Expenditure during operate project**						
	Maintainanace fee			1.5%	total rental fee		
	Insurance			0.01%	cost of construction		
5	**Staff's salary**						
	Manager	1	person	30,000	monthly (Baht)	30,000	monthly (Baht)
	Admin	1	person	20,000	monthly (Baht)	20,000	monthly (Baht)
	Accountant	1	person	15,000	monthly (Baht)	15,000	monthly (Baht)
	Receptionist	2	person	15,000	monthly (Baht)	30,000	monthly (Baht)
	Janitor/housekeeper	2	people	9,500	monthly (Baht)	19,000	monthly (Baht)
	Security guard	2	people	12,000	monthly (Baht)	24,000	monthly (Baht)
	Salary growth rate	0.5%	yearly				
	Total staff's salary					**1,656,000.00**	**yearly (Baht)**
6	**Management & marketing**						
	Marketing fee			1%	total rental fee		
	Management fee			2%	total rental fee		
	Others			0.5%	total rental fee		

Table 17: Apartment Soft Costs

According to Table 17, it shows all the possible soft costs that should be considered and taken into calculation. Once the project starts, there will surely be some maintenance for customers' requests and for keeping the project fresh and always ready to use, so about 1.5% of the total rental revenue and about 0.01% of the total construction cost will be saved for the maintenance cost and the building's insurance. Moreover, staff salary is the biggest soft cost here as it shows in the table. There should be 1 manager, 1 admin, 1 accountant, 1

receptionist each building, 1 janitor each building, 2 security guards and surely their minimum wages will rise about 0.5% yearly, so the total cost of the salaries alone is 1,656,000 Thai Baht in the first year and will increase 0.5% year after year. Last but not least, if you want your business to survive in the digital era, you must have some budget for the online/offline marketing and some business advice from consultants, so about 3.5% of the total incomes will be saved for these costs.

Financial Information

	List	Quantity	Unit	Amount	Unit	sum	
7	**TAX**						
	Income Tax			20%	profit		
	Land & building Tax			0.3%	estimate prices of the land and the building		
8	**Financial struture**						
	Fund (saving)		40%	48,860,167	Baht		
	Loan (bank)		60%	73,290,251	Baht		
	Loan interest rate		7%		yearly		
	Return loan		90%		yearly		

Table 18: Apartment Financial Information

Table 18 shows what you need to know about finance before investing, such as taxation, and the mechanics of financial tools like loans and interest rates. According to ITAX, it shows that

- if net profit is less than 300,000 Thai Baht yearly, you may omit income tax.
- if net profit is in between 300,000 and 3,000,000 Thai Baht yearly, you have to pay 15 percent of net profit for income tax.
- if net profit is more than 3,000,000 Thai Baht yearly, you have to pay 20 percent of net profit for income tax.

Here, based on Table 15, 16, and 17, it can assume that the income tax for this project is 20 percent. Other than the corporate income tax, you may need to pay for the property tax.

Based on DDproperty, it shows that if the estimated value of the property is more than 5 million Thai Baht, and the property is a business and meant to make profit, you have to pay 0.3 percent of property tax.

Financial tools are very important for all businesses. As you can see, a real estate project requires a huge amount of investment to finish the job. A loan from a bank could be one of the answers that you may need to consider. Most of the time, the bank will let you borrow about 50 percent to 90 percent of the value of guaranteed assets and most of the time, the developer would use raw land that would do a project as a guarantee and surely you have to make repayments of both installments and interests and if you cannot make the repayment, the bank will seize the asset. Therefore, 60 percent of the total project value would be a fare ratio for the loan payment for this project and yearly repay about 90 percent of the net profit for the installments, plus 3 percent of the interests.

Now, the next table will run all the data from table 15 to 18 to see how long it takes to break even and how much profit earned in 5 years, 10 years, 15 years, and 20 years to compare with the office project to see which one is better investing for Company-A.

8.3.1.1 Data Analyzing of the Apartment Project

Matrix	%	Year 0 (construction)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Revenue											
Room rental	3%	every 3 years	7,584,111.00	8,089,718.40	9,373,961.20	10,415,734.92	10,415,734.92	10,728,206.97	10,728,206.97	10,728,206.97	11,050,053.18
Public facilities	0.25%		18,960.28	20,224.30	23,434.90	26,039.34	26,039.34	26,820.52	26,820.52	26,820.52	27,625.13
Food and beverage	0.25%		18,960.28	20,224.30	23,434.90	26,039.34	26,039.34	26,820.52	26,820.52	26,820.52	27,625.13
Parking lot	FIX		6,900.00	6,901.00	6,902.00	6,903.00	6,904.00	6,905.00	6,906.00	6,907.00	6,908.00
Others (maintenancing/cleaning serv	3%		227,523.33	242,691.55	281,218.84	312,472.05	312,472.05	321,846.21	321,846.21	321,846.21	331,501.60
Value of the land	1%	every year									
Total revenue			7,856,454.89	8,379,759.54	9,708,951.84	10,787,188.64	10,787,189.64	11,110,599.21	11,110,600.21	11,110,601.21	11,443,713.04
Expenditure											
Investment ratio	100%										
Raw land price		- 46,900,000.00									
Construction price		- 73,800,418.00									
Interior and decoration		- 1,450,000.00									
E.I.A (Environmental document)	0%	-									
Room maintainancing	1.5%	-	- 117,846.82	- 125,696.39	- 145,634.28	- 161,807.83	- 161,807.84	- 166,658.99	- 166,659.00	- 166,659.02	- 171,655.70
Total expenditure		- 122,150,418.00	- 117,846.82	- 125,696.39	- 145,634.28	- 161,807.83	- 161,807.84	- 166,658.99	- 166,659.00	- 166,659.02	- 171,655.70
Gross profit margin		(122,150,418.00)	7,738,608.06	8,254,063.15	9,563,317.56	10,625,380.81	10,625,381.80	10,943,940.22	10,943,941.21	10,943,942.20	11,272,057.34
Management costs											
Staffs salaries	0.5%		- 1,656,000.00	- 1,664,280.00	- 1,672,601.40	- 1,680,964.41	- 1,689,369.23	- 1,697,816.08	- 1,706,305.16	- 1,714,836.68	- 1,723,410.86
Marketing	1%		- 78,564.55	- 83,797.60	- 97,089.52	- 107,871.89	- 107,871.90	- 111,105.99	- 111,106.00	- 111,106.01	- 114,437.13
Management	2%		- 157,129.10	- 167,595.19	- 194,179.04	- 215,743.77	- 215,743.79	- 222,211.98	- 222,212.00	- 222,212.02	- 228,874.26
Others	0.5%		- 39,282.27	- 41,898.80	- 48,544.76	- 53,935.94	- 53,935.95	- 55,553.00	- 55,553.00	- 55,553.01	- 57,218.57
Property yearly tax	0.3%		- 366,451.25	- 366,415.25	- 366,414.25	- 366,413.25	- 366,412.25	- 366,411.25	- 366,410.25	- 366,409.25	- 366,408.25
Total management costs			- 2,297,427.17	- 2,323,986.83	- 2,378,828.96	- 2,424,929.26	- 2,433,333.12	- 2,453,098.30	- 2,461,586.41	- 2,470,116.97	- 2,490,349.07
Gross profit after management cost		(122,150,418.00)	5,441,180.89	5,930,076.32	7,184,488.60	8,200,451.55	8,192,048.68	8,490,841.93	8,482,354.80	8,473,825.22	8,781,708.27
Financial statement											
Fund	40%	- 48,860,167.00									
Loan draw down	60%	- 73,290,251.00									
Loan interest	7%	-	- 5,130,317.57	- 4,755,527.83	- 4,363,443.64	- 3,915,821.92	- 3,425,769.05	- 2,945,744.72	- 2,460,069.69	- 1,984,341.64	- 1,518,367.76
Profit before Tax		(122,150,418.00)	310,863.32	1,174,548.49	2,821,044.96	4,284,629.64	4,766,279.63	5,545,097.20	6,022,285.10	6,489,483.58	7,263,340.51
Tax	20%		62,172.66	234,909.70	564,208.99	856,925.93	953,255.93	1,109,019.44	1,204,457.02	1,297,896.72	1,452,668.10
Net Profit		(122,150,418.00)	248,690.65	939,638.79	2,256,835.97	3,427,703.71	3,813,023.71	4,436,077.76	4,817,828.08	5,191,586.86	5,810,672.41
Loan repayment	90%	-	223,821.59	845,674.91	2,031,152.37	3,084,933.34	3,431,721.34	3,992,469.99	4,336,045.27	4,672,428.18	5,229,605.17
Out standing loan		(73,290,251.00)	(67,936,111.84)	(62,334,909.10)	(55,940,313.09)	(48,939,557.84)	(42,082,067.46)	(35,143,852.75)	(28,347,737.78)	(21,690,967.96)	(14,942,995.03)
Accumulated net profit		- 48,860,167.00	(48,835,297.93)	(48,741,334.06)	(48,515,650.46)	(48,172,880.09)	(47,791,577.72)	(47,347,969.94)	(46,866,187.13)	(46,347,028.45)	(45,765,961.21)

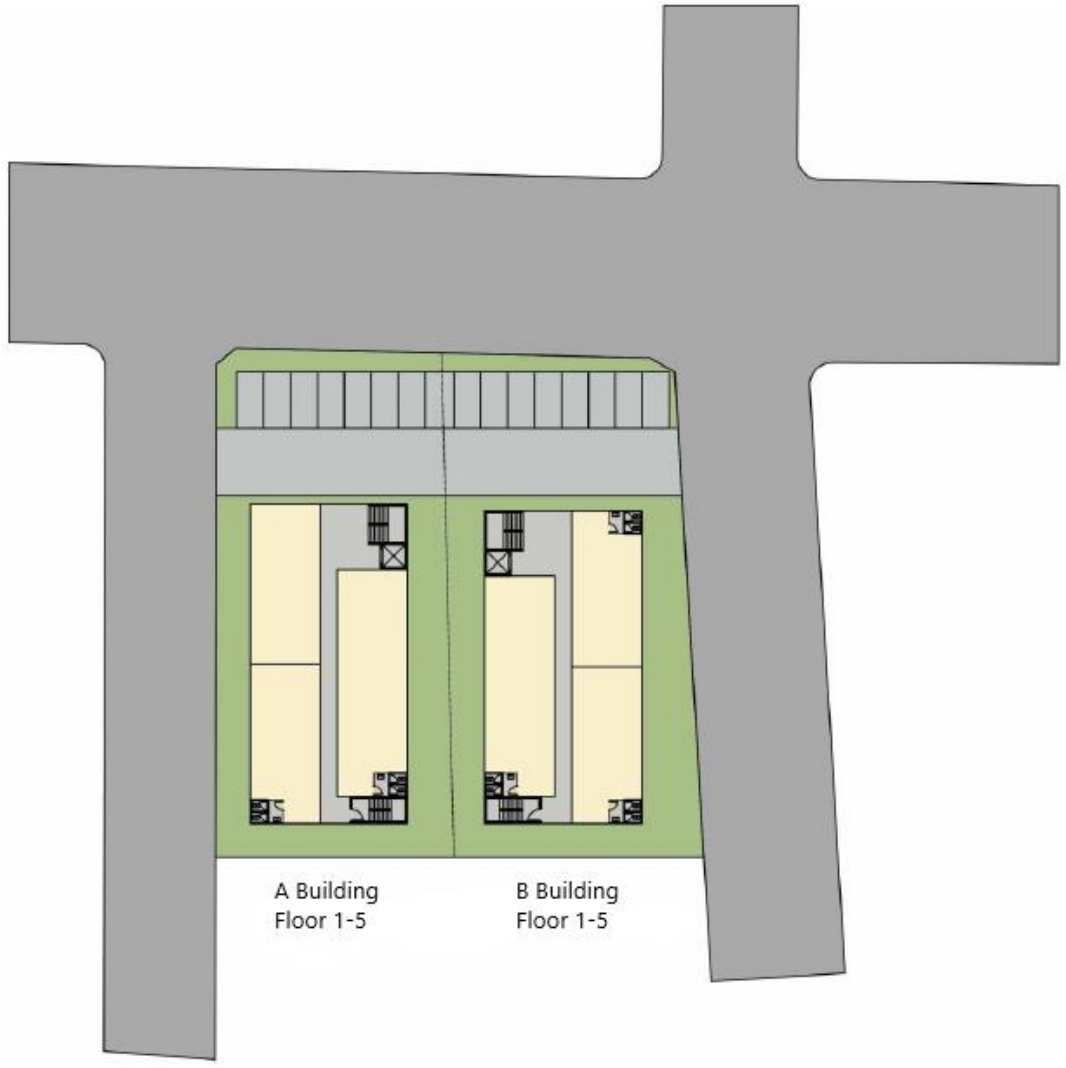
Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
11,050,053.18	11,050,053.18	11,381,554.77	11,381,554.77	11,381,554.77	11,723,001.42	11,723,001.42	11,723,001.42	12,074,691.46	12,074,691.46	12,074,691.46
27,625.13	27,625.13	28,453.89	28,453.89	28,453.89	29,307.50	29,307.50	29,307.50	30,186.73	30,186.73	30,186.73
27,625.13	27,625.13	28,453.89	28,453.89	28,453.89	29,307.50	29,307.50	29,307.50	30,186.73	30,186.73	30,186.73
6,909.00	6,910.00	6,911.00	6,912.00	6,913.00	6,914.00	6,915.00	6,916.00	6,917.00	6,918.00	6,919.00
331,501.60	331,501.60	341,446.64	341,446.64	341,446.64	351,690.04	351,690.04	351,690.04	362,240.74	362,240.74	362,240.74
										56,660,309.78
11,443,714.04	11,443,715.04	11,786,820.19	11,786,821.19	11,786,822.19	12,140,220.46	12,140,221.46	12,140,222.47	12,504,222.66	12,504,223.66	69,164,534.44
- 171,655.71	- 171,655.73	- 176,802.30	- 176,802.32	- 176,802.33	- 182,103.31	- 182,103.32	- 182,103.34	- 187,563.34	- 187,563.35	- 1,037,468.02
- 171,655.71	- 171,655.73	- 176,802.30	- 176,802.32	- 176,802.33	- 182,103.31	- 182,103.32	- 182,103.34	- 187,563.34	- 187,563.35	- 1,037,468.02
11,272,058.33	11,272,059.31	11,610,017.89	11,610,018.87	11,610,019.86	11,958,117.16	11,958,118.14	11,958,119.13	12,316,659.32	12,316,660.30	68,127,066.42
- 1,732,027.92	- 1,740,688.06	- 1,749,391.50	- 1,758,138.46	- 1,766,929.15	- 1,775,763.79	- 1,784,642.61	- 1,793,565.83	- 1,802,533.66	- 1,811,546.32	- 1,820,604.06
- 114,437.14	- 114,437.15	- 117,868.20	- 117,868.21	- 117,868.22	- 121,402.20	- 121,402.21	- 121,402.22	- 125,042.23	- 125,042.24	- 691,645.34
- 228,874.28	- 228,874.30	- 235,736.40	- 235,736.42	- 235,736.44	- 242,804.41	- 242,804.43	- 242,804.45	- 250,084.45	- 250,084.47	- 1,383,290.69
- 57,218.57	- 57,218.58	- 58,934.10	- 58,934.11	- 58,934.11	- 60,701.10	- 60,701.11	- 60,701.11	- 62,521.11	- 62,521.12	- 345,822.67
- 366,407.25	- 366,406.25	- 366,405.25	- 366,404.25	- 366,403.25	- 366,402.25	- 366,401.25	- 366,400.25	- 366,399.25	- 366,398.25	- 366,397.25
- 2,498,965.16	- 2,507,624.34	- 2,528,335.46	- 2,537,081.45	- 2,545,871.18	- 2,567,073.76	- 2,575,951.61	- 2,584,873.86	- 2,606,580.70	- 2,615,592.40	- 4,607,760.01
8,773,093.17	8,764,434.98	9,081,682.43	9,072,937.42	9,064,148.68	9,391,043.40	9,382,166.53	9,373,245.27	9,710,078.62	9,701,067.90	63,519,306.41
- 1,046,009.65	- 583,343.97	- 130,182.90								
7,727,083.51	8,181,091.01	8,951,499.53	9,072,937.42	9,064,148.68	9,391,043.40	9,382,166.53	9,373,245.27	9,710,078.62	9,701,067.90	63,519,306.41
1,545,416.70	1,636,218.20	1,790,299.91	1,814,587.48	1,812,829.74	1,878,208.68	1,876,433.31	1,874,649.05	1,942,015.72	1,940,213.58	12,703,861.28
6,181,666.81	6,544,872.81	7,161,199.62	7,258,349.94	7,251,318.95	7,512,834.72	7,505,733.22	7,498,596.21	7,768,062.90	7,760,854.32	50,815,445.13
5,563,500.13	5,890,385.53	6,445,079.66								
(8,333,485.25)	(1,859,755.75)									
(45,147,794.52)	(44,493,307.24)	(37,332,107.62)	(30,073,757.68)	(22,822,438.74)	(15,309,604.02)	(7,803,870.80)	(305,274.58)	**7,462,788.31**	15,223,642.64	66,039,087.76

Table 19: Data Analyzing of the Apartment Project

According to Table 19, it shows the feasibility of the apartment project. As you can see, all the data that is gathered from the previous section have been plugged in the table in order to run the feasibility. The table is divided into main 6 parts which are revenue, expenditure, management cost, financial statement, tax, and loan repayment respectively. It also shows the cash flow from year zero to year twenty. The year zero is when the project is under construction and the project actually starts operating in year 1 as you can see. What you really need to focus on this table is the financial statement and below parts since it shows how much you are able to repay the loan each year, the total outstanding loan, and the accumulated net profit of the project. By analyzing these data, you can make a prediction of how long it takes for the project to break even.

As a result, it shows that it takes about 12 years to repay all the loan, and about 18 years for the project to break even. In the first 5 years, the net profit of the project is about 3.8 million Thai Baht, nevertheless, 90 percent of the profit has to be returned to the bank which is about 3.4 million Thai Baht, so both outstanding loan and accumulated net profit from year 1 to year 5 are still around negative 47 million which is very bad. In year 10, there is not much change from year 5 since there is still outstanding loan. However, in year 15, all the loans have been repaid, and there is only 15 million Thai Baht to go before the break-even point. At this point, you can assume that the land becomes your asset, and you are able to sell it whenever you are capable, so in this case, let assume that you can sell it in year 20 and the value of the land rises by 1% every year. Therefore, in year 20, the accumulated net profit jumped from about 23 million Thai Baht to 66 million Thai Baht.

8.3.2 Feasibility Study of Offices



Total Building Area	Rental/Usable Area	%	Common Area	%	Parking Lots
3,942	3,007	76%	935	24%	more than 16

Table 20: Office layout and information

According to Table 20, since both the office and the apartment projects have the same project layout, the total area is the same, nonetheless, it shows that the rental area of

the office project is about 300 sq. m bigger than the apartment project which will surely increase the architectural cost. The reason is that the office project requires less common areas like lobbies and MDB rooms, so the rental area increases by 7% from the apartment project.

Income

Feasibility Study of Offices Project							
	List	Quantity	Unit	Amount	Unit		
1	**Revenue**						
	Year 1		1	80%	rental rate		
	Year 2		2	90%	rental rate		
	Year 3		3	100%	rental rate		
	Year 4		4	100%	rental rate		
	Year 5 & So on		5	100%	rental rate		
	Type 1 room (126 sq. m)	5	room	37,800	monthly (Baht)	300 Baht / sq.m	
	Type 2 room (123 sq. m)	5	room	36,900	monthly (Baht)	300 Baht / sq.m	
	Type 3 room (88 sq. m)	20	room	26,400	monthly (Baht)	300 Baht / sq.m	
	Parking Lots	23	car				
	Rental feen growth rate			3%	every 3 years		
2	**Other revenue**						
	other revenue			0.00%	from total revenue		
	- selling food and beverage						
	- public washing machines						
	- etc.						

Table 21: Office Income

As it shows in Table 21, the expected rate of rental in the first 2 years is higher than the apartment project due to the fact that Property-X is in the prime office area, and the property is in the middle of the area as you can see in figure 4. Therefore, the demand for offices is expected to be more than the demand for apartments. As a result, the rate of rental should reach 100 percent in 3 years. In addition, there are 3 types of office sizes which are 126 sq.m, 123 sq.m, and 88 sq.m depending on the left area of each floor. However, the price per 1 sq.m for every type is the same and that is 300 Thai Baht per 1 sq.m and surely there is no indirect revenue like the apartment project. Thus, the total revenue of the office project is:

$\big((37{,}800 \times\ 5) + (36{,}900 \times\ 5) + (26{,}400 \times\ 20)\big) \times\ 12\ = 10{,}812{,}000$ Thai Baht annually.

and the rental fee would also increase by 3 percent annually.

Hard costs

	List	Quantity	Unit	Amount	Unit	sum	
3	**Project cost and budget**						
	Cost of raw-land	469	Sq. wah	100,000	Baht per Sq. wah	46,900,000	Baht
	Cost of construction	3,942	Sq. m	**20,000**	Baht per Sq. m	**78,846,600**	Baht
	Infrastructure	0	Sq. m	0	Baht per Sq. m	0	Baht
	Interior			0	Baht per room	0	Baht
	Electrical appliances			50,000	Baht per room	1,500,000	Baht
	Architectural design fee			3%	Total project value	2,365,398	Baht
	EIA fee			0	Bath	0	Baht
	Official documents fee			1%	Total project value	788,466	Baht
	Total project cost and budget					**130,400,464**	**Baht**

Table 22: Office Hard Costs

Table 22 is very similar to Table 16 but let assume that the expected cost of construction is higher due to the reason that the offices require better floors finishing, walls finishing, and lighting systems, so the cost of the raw land is certainly the same which is 46,900,000 Thai Baht while the cost of construction is 78,846,600 Thai Baht. Plus, the electrical appliances, the 3 percent of architectural design fee and the 1 percent of official documents fee, the total hard cost of the office project is 130,400,464 Thai Baht which is 8,250,046 Thai Baht more expensive than the apartment project.

Soft Costs & Financial Information

	List	Quantity	Unit	Amount	Unit	sum	
4	**Expenditure during operate project**						
	Maintainanace fee			1.5%	total rental fee		
	Insurance			0.01%	cost of construction		
5	**Staff's salary**						
	Manager	1	person	30,000	monthly (Baht)	30,000	monthly (Baht)
	Admin	1	person	20,000	monthly (Baht)	20,000	monthly (Baht)
	Accountant	1	person	15,000	monthly (Baht)	15,000	monthly (Baht)
	Receptionist		person		monthly (Baht)	-	monthly (Baht)
	Janitor/housekeeper		people		monthly (Baht)	-	monthly (Baht)
	Security guard	2	people	12,000	monthly (Baht)	24,000	monthly (Baht)
	Salary growth rate	0.5%	yearly				
	Total staff's salary					**1,068,000.00**	**yearly (Baht)**
6	**Management & marketing**						
	Marketing fee			1%	total rental fee		
	Management fee			2%	total rental fee		
	Others			0.5%	total rental fee		
	List	**Quantity**	**Unit**	**Amount**	**Unit**	**sum**	
7	**TAX**						
	Income Tax			20%	revenue		
	Land & building Tax			0.3%	estimate prices of the land and the building		
8	**Financial struture**						
	Fund (saving)		40%	52,160,186	Baht		
	Loan (bank)		60%	78,240,278	Baht		
	Loan interest rate		7%		yearly		
	Return loan		90%		yearly		

Table 23: Office Soft Costs & Financial Information

According to Table 23, the office project certainly requires less staff than the apartment project since you do not need to hire the common receptionist and the common janitors, so the total staff's salaries is 1,068,000 Thai Baht, and the others soft costs and the financial factors are pretty much the same with the apartment project as you can see the table. By plugging in these data of the office project to the calculation, the result shows as follows;

8.3.2.1 Data Analysing of the Office Project

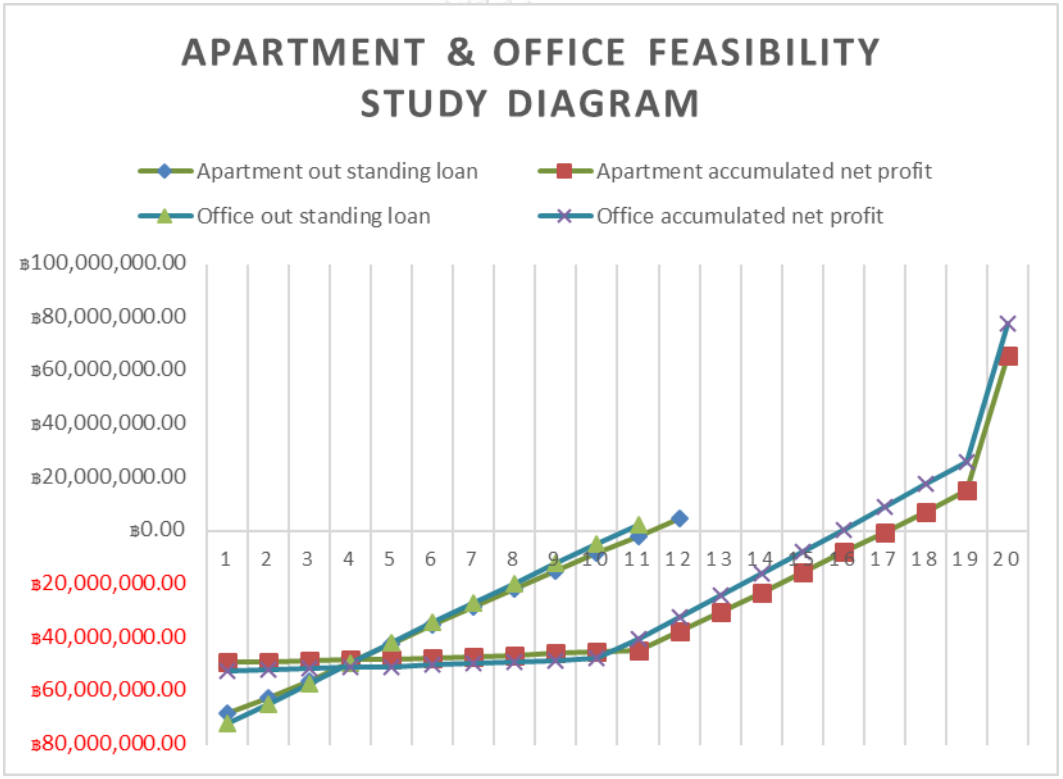
Matrix	%	Year 0 (construction)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Revenue											
Room rental	3%	every 3 years	8,649,600.00	9,730,800.00	11,136,360.00	11,136,360.00	11,136,360.00	11,470,450.80	11,470,450.80	11,470,450.80	11,814,564.32
Others (maintenancing/cleaning services)		-									
Value of the land											
Total revenue			8,649,600.00	9,730,800.00	11,136,360.00	11,136,360.00	11,136,360.00	11,470,450.80	11,470,450.80	11,470,450.80	11,814,564.32
Expenditure											
Investment ratio	100%										
Raw land price		- 46,900,000.00									
Construction price		- 78,846,600.00									
Electrical appliances		- 1,500,000.00									
Architectural design fee	3%	- 2,365,398.00									
Official documents fee	1%	- 788,466.00									
Room maintainancing	1.5%	-	- 129,744.00	- 145,962.00	- 167,045.40	- 167,045.40	- 167,045.40	- 172,056.76	- 172,056.76	- 172,056.76	- 177,218.46
Total expenditure		- 130,400,464.00	- 129,744.00	- 145,962.00	- 167,045.40	- 167,045.40	- 167,045.40	- 172,056.76	- 172,056.76	- 172,056.76	- 177,218.46
Gross profit margin		(130,400,464.00)	8,519,856.00	9,584,838.00	10,969,314.60	10,969,314.60	10,969,314.60	11,298,394.04	11,298,394.04	11,298,394.04	11,637,345.86
Management costs											
Staffs salaries	0.5%		- 1,068,000.00	- 1,073,340.00	- 1,078,706.70	- 1,084,100.23	- 1,089,520.73	- 1,094,968.34	- 1,100,443.18	- 1,105,945.40	- 1,111,475.12
Marketing	1%		- 86,496.00	- 97,308.00	- 111,363.60	- 111,363.60	- 111,363.60	- 114,704.51	- 114,704.51	- 114,704.51	- 118,145.64
Management	2%		- 172,992.00	- 194,616.00	- 222,727.20	- 222,727.20	- 222,727.20	- 229,409.02	- 229,409.02	- 229,409.02	- 236,291.29
Others	0.5%		- 43,248.00	- 48,654.00	- 55,681.80	- 55,681.80	- 55,681.80	- 57,352.25	- 57,352.25	- 57,352.25	- 59,072.82
Property yearly tax	0.3%		- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39
Total management costs			- 1,761,937.39	- 1,805,119.39	- 1,859,680.69	- 1,865,074.22	- 1,870,494.72	- 1,887,635.51	- 1,893,110.35	- 1,898,612.56	- 1,916,186.26
Gross profit after management cost		(130,400,464.00)	6,757,918.61	7,779,718.61	9,109,633.91	9,104,240.38	9,098,819.88	9,410,758.53	9,405,283.69	9,399,781.47	9,721,159.59
Financial statement											
Fund	40%	- 52,160,186.00									
Loan draw down	60%	- 78,240,278.00									
Loan interest	7%	-	- 5,476,819.46	- 5,028,874.70	- 4,538,210.94	- 3,990,136.46	- 3,453,076.07	- 2,926,815.25	- 2,395,147.44	- 1,874,176.26	- 1,363,693.42
Profit before Tax		(130,400,464.00)	1,281,099.15	2,750,843.91	4,571,422.97	5,114,103.92	5,645,743.81	6,483,943.28	7,010,136.25	7,525,605.22	8,357,466.18
Tax	20%		256,219.83	550,168.78	914,284.59	1,022,820.78	1,129,148.76	1,296,788.66	1,402,027.25	1,505,121.04	1,671,493.24
Net Profit		(130,400,464.00)	1,024,879.32	2,200,675.13	3,657,138.38	4,091,283.14	4,516,595.05	5,187,154.62	5,608,109.00	6,020,484.17	6,685,972.94
Loan repayment	90%	-	922,391.39	1,980,607.61	3,291,424.54	3,682,154.82	4,064,935.54	4,668,439.16	5,047,298.10	5,418,435.76	6,017,375.65
Out standing loan		(78,240,278.00)	(71,841,067.15)	(64,831,584.84)	(57,001,949.36)	(49,329,658.08)	(41,811,646.47)	(34,216,392.06)	(26,773,946.52)	(19,481,334.50)	(12,100,265.44)
Accumulated net profit		- 52,160,186.00	(52,057,698.07)	(51,837,630.56)	(51,471,916.72)	(51,062,788.40)	(50,611,128.90)	(50,092,413.44)	(49,531,602.54)	(48,929,554.12)	(48,260,956.83)

Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
11,814,564.32	11,814,564.32	11,814,564.32	12,169,001.25	12,169,001.25	12,169,001.25	12,534,071.29	12,534,071.29	12,534,071.29	12,910,093.43	12,910,093.43	12,910,093.43
											56,660,309.78
11,814,564.32	11,814,564.32	11,814,564.32	12,169,001.25	12,169,001.25	12,169,001.25	12,534,071.29	12,534,071.29	12,534,071.29	12,910,093.43	12,910,093.43	69,570,403.21
- 177,218.46	- 177,218.46	- 177,218.46	- 182,535.02	- 182,535.02	- 182,535.02	- 188,011.07	- 188,011.07	- 188,011.07	- 193,651.40	- 193,651.40	- 1,043,556.05
- 177,218.46	- 177,218.46	- 177,218.46	- 182,535.02	- 182,535.02	- 182,535.02	- 188,011.07	- 188,011.07	- 188,011.07	- 193,651.40	- 193,651.40	- 1,043,556.05
11,637,345.86	11,637,345.86	11,637,345.86	11,986,466.23	11,986,466.23	11,986,466.23	12,346,060.22	12,346,060.22	12,346,060.22	12,716,442.03	12,716,442.03	68,526,847.16
- 1,111,475.12	- 1,117,032.50	- 1,122,617.66	- 1,128,230.75	- 1,133,871.90	- 1,139,541.26	- 1,145,238.97	- 1,150,965.16	- 1,156,719.99	- 1,162,503.59	- 1,168,316.11	- 1,174,157.69
- 118,145.64	- 118,145.64	- 118,145.64	- 121,690.01	- 121,690.01	- 121,690.01	- 125,340.71	- 125,340.71	- 125,340.71	- 129,100.93	- 129,100.93	- 695,704.03
- 236,291.29	- 236,291.29	- 236,291.29	- 243,380.03	- 243,380.03	- 243,380.03	- 250,681.43	- 250,681.43	- 250,681.43	- 258,201.87	- 258,201.87	- 1,391,408.06
- 59,072.82	- 59,072.82	- 59,072.82	- 60,845.01	- 60,845.01	- 60,845.01	- 62,670.36	- 62,670.36	- 62,670.36	- 64,550.47	- 64,550.47	- 347,852.02
- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39	- 391,201.39
- 1,916,186.26	- 1,921,743.64	- 1,927,328.80	- 1,945,347.18	- 1,950,988.34	- 1,956,657.70	- 1,975,132.85	- 1,980,859.05	- 1,986,613.87	- 2,005,558.25	- 2,011,370.77	- 4,000,323.19
9,721,159.59	9,715,602.22	9,710,017.06	10,041,119.05	10,035,477.90	10,029,808.54	10,370,927.37	10,365,201.17	10,359,446.35	10,710,883.78	10,705,071.26	64,526,523.97
- 1,363,693.42	- 847,018.58	- 340,750.66									
8,357,466.18	8,868,583.64	9,369,266.39	10,196,431.96	10,035,477.90	10,029,808.54	10,370,927.37	10,365,201.17	10,359,446.35	10,710,883.78	10,705,071.26	64,526,523.97
1,671,493.24	1,773,716.73	1,873,853.28	2,039,286.39	2,007,095.58	2,005,961.71	2,074,185.47	2,073,040.23	2,071,889.27	2,142,176.76	2,141,014.25	12,905,304.79
6,685,972.94	7,094,866.91	7,495,413.11	8,157,145.57	8,028,382.32	8,023,846.83	8,296,741.89	8,292,160.94	8,287,557.08	8,568,707.02	8,564,057.01	51,621,219.17
6,017,375.65	6,385,380.22	6,745,871.80									
(12,100,265.44)	(4,867,866.64)										
(48,260,956.83)	(47,551,470.13)	(40,056,057.02)	(31,898,911.45)	(23,870,529.13)	(15,846,682.30)	(7,549,940.41)	**742,220.53**	9,029,777.61	17,598,484.63	26,162,541.64	77,783,760.81

Table 24: Data Analyzing of the Office Project

According to Table 24, it clearly shows that the total annual revenue is higher than the apartment project which could make an assumption that this project would be better in

the long term when the project passes the breakeven point. Moreover, the office project requires less staff which even makes the annual management costs lower. However, this project has more usable areas and requires better materials which would lead to the rise in the cost of the construction compared to the apartment project. Therefore, to compare the apartment project and the office project, let's put the collected data side by side to see which one has a greater potential to be successful.



Diagrams 5: Apartment & Office Feasibility Study Diagram

According to Diagram 5, it shows the comparisons of the outstanding loans and the accumulated net profits between the apartment project and the office project which both of them are located in the same location, and are also constructed to the same size and layout. The differences are the type of the project and some raw materials cost. However, the data clearly shows that the office project is slightly better than the apartment project. It shows

that the office project can return all the loans in year 11 which is one year faster. Plus, the office project can also reach the break-even point in year 16 which is also 1 years faster than the apartment project. As you can see, the first 5 to 10 years, there is not much difference between both projects but due to the higher income of the office project, the loan is repaid faster. As a result, the office project is the better long term project that would be chosen to be set as the standard example of a long term investment project for a real estate company before vertically integrated.

8.4 Business Expansion by doing Vertical Integration of a Construction Company to Real-Estate Company

Based on the feasibility study in the previous section, it shows that it is not easy at all to have a passive income since you should have about 40 percent of the total value of the project on your savings and after you invest, you have to wait for a long time for the project to reach the breakeven point. It cannot be possible to just invest all that huge amount of money and wait for more than 10 years to repay all the loans without having other sources of income, but once the project reaches the breakeven point, it would be a very stable source of income. Unless, the real estate department builds a project for sale, not for rent which is an active income and by doing this, it may expand the revenue of the company but it does not fix the pain points. On the other hand, a construction business is one another story since a construction business is super active. The business has to deal with many kinds of risks as mentioned in the very first section, for example, a construction business is too sensitive to changes in economy, relying too much on a couple clients, and unforeseen problems during a construction, nonetheless, it can produce fast money in return. Therefore,

by vertically integrating a construction company to a real estate company might be the answer. They might cancel out each company's weaknesses and also increase some strengths and opportunities.

Assumption

With the vertical integration of the construction company to a real estate company, it can make some assumptions that the cost of construction & maintenance would definitely reduce, the operation costs can be shared between 2 businesses, and since Property-X is already Company-A's asset, it is a sunk cost that came from the profit of the company. Therefore, let assume that;

- The cost of raw land is zero due to the fact that it is Company-A's sunk cost.
- The company will not add any overhead and profit to the new department. According to Table 1, the average direct profits from 2015 to 2019 is 14.454 percent, so it means that if the businesses are integrated, the office project can save about 14.454 percent of the cost of construction, and the yearly maintenance cost would reduce by 0.5 percent.
- Last but not least, the operation costs will also reduce since the 2 businesses can share the headquarter office, and departments like, finance, accounting, HR, etc.

The summary of the new data shows as follows;

Feasibility Study of the Vertical Integration Businesses							
	List	Quantity	Unit	Amount	Unit		
1	**Revenue**						
	Year 1		1	80%	rental rate		
	Year 2		2	90%	rental rate		
	Year 3		3	100%	rental rate		
	Year 4		4	100%	rental rate		
	Year 5 & So on		5	100%	rental rate		
	Type 1 room (126 sq. m)	5	room	37,800	monthly (Baht)	300 Baht / sq.m	
	Type 2 room (123 sq. m)	5	room	36,900	monthly (Baht)	300 Baht / sq.m	
	Type 3 room (88 sq. m)	20	room	26,400	monthly (Baht)	300 Baht / sq.m	
	Parking Lots	23	car				
	Rental feen growth rate			3%	every 3 years		
2	**Project cost and budget**						
	Cost of raw-land	469	Sq. wah	100,000	Baht per Sq. wah	Sunk Cost	Baht
	Cost of construction	3,942	Sq. m		Baht per Sq. m	67,450,112	Baht
	Infrastructure	0	Sq. m	0	Baht per Sq. m	0	Baht
	Interior			0	Baht per room	0	Baht
	Electrical appliances			50,000	Baht per room	1,500,000	Baht
	Architectural design fee			3%	Cost of construction	2,023,503	Baht
	EIA fee			0	Bath	0	Baht
	Official documents fee			1%	Cost of construction	674,501	Baht
	Total project cost and budget					**71,648,117**	**Baht**
3	**Expenditure during operate project**						
	Maintainanace fee			**1.0%**	total rental fee		
	Insurance			0.01%	cost of construction		
4	**Staff's salary**						
	Manager	1	person	30,000	monthly (Baht)	30,000	monthly (Baht)
	Security guard	2	people	12,000	monthly (Baht)	24,000	monthly (Baht)
	Salary growth rate	0.5%	yearly				
	Total staff's salary					**648,000.00**	**yearly (Baht)**

Table 25: Feasibility Study of the Vertical Integration Businesses

According to Table 25, it shows the necessary information that will be used to run the feasibility study when Company-A vertically integrates to a real estate business with the chosen location and project. As you can see in the table, in order to compare apple to apple, all the data have to be the same except the mentioned assumptions. Therefore, the income of the project has to be the same since the vertical integration does not affect marketing plans or appearance of the project. On the other hand, there are certain chances in the outputs. First, since both businesses are integrated and the land is already a sunk cost of the company, there is no reason why the company has to invest in a new land. Second, the

construction cost reduces by 14.454 percent from the direct profit, so the construction cost, now, is 67,450,112 Thai Baht, which also affects the cost of architecture design. As a result, the total expenditure excluding the operation costs is 71,648,116.44 Thai Baht. Third, since they both share the operation costs, office and staff, the maintenance cost would be reduced by 0.5 percent due to the fact that Company-A already has a maintenance team for its project and clients, most of the maintenance cost would come from raw material costs, not the workers' wages. Moreover, as mentioned, the employees will be centralized from the head office, so the only staff that has to standby at the office project is a manager, and a security guard, one in daytime and another in nighttime. As a result, the soft cost was reduced by 420,000 Thai Baht annually. Lastly, the financial part like tax, and the percentage of the loan repayment would stay the same

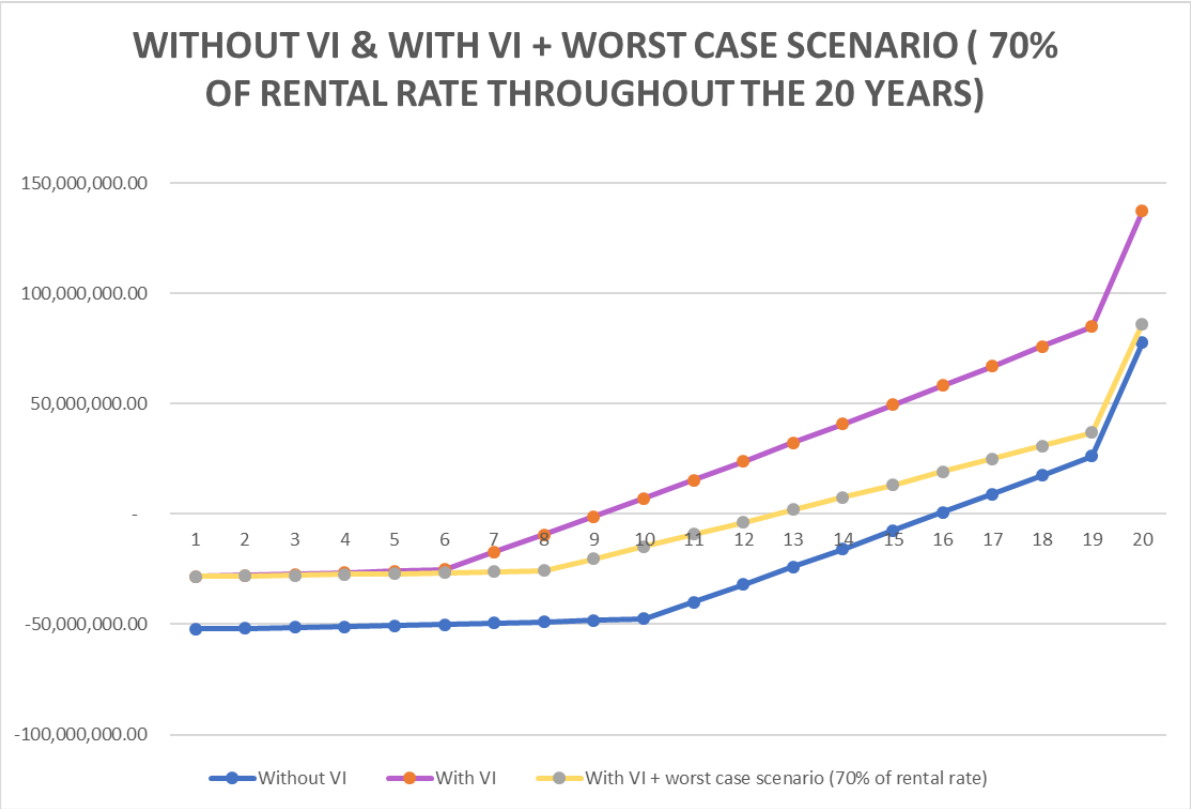
8.4.1 Data Analysing of the Office Project after Vertical Integration

Matrix	%	Year 0 (construction)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Revenue											
Room rental	3%	every 3 years	8,649,600.00	9,730,800.00	11,136,360.00	11,136,360.00	11,136,360.00	11,470,450.80	11,470,450.80	11,470,450.80	11,814,564.32
Others (maintenancing/cleaning services)		-									
Value of the land											
Total revenue			8,649,600.00	9,730,800.00	11,136,360.00	11,136,360.00	11,136,360.00	11,470,450.80	11,470,450.80	11,470,450.80	11,814,564.32
Expenditure											
Investment ratio	100%										
Raw land price		Sunk Cost									
Construction price		- 67,450,112.44									
Electrical appliances		- 1,500,000.00									
Architectural design fee	3%	- 2,023,503.00									
Official documents fee	1%	- 674,501.00									
Room maintainancing	1.0%	-	- 86,496.00	- 97,308.00	- 111,363.60	- 111,363.60	- 111,363.60	- 114,704.51	- 114,704.51	- 114,704.51	- 118,145.64
Total expenditure		- 71,648,116.44	- 86,496.00	- 97,308.00	- 111,363.60	- 111,363.60	- 111,363.60	- 114,704.51	- 114,704.51	- 114,704.51	- 118,145.64
Gross profit margin		(71,648,116.44)	8,563,104.00	9,633,492.00	11,024,996.40	11,024,996.40	11,024,996.40	11,355,746.29	11,355,746.29	11,355,746.29	11,696,418.68
Management costs											
Staffs salaries	0.5%		- 648,000.00	- 651,240.00	- 654,496.20	- 657,768.68	- 661,057.52	- 664,362.81	- 667,684.63	- 671,023.05	- 674,378.16
Marketing	1%		- 86,496.00	- 97,308.00	- 111,363.60	- 111,363.60	- 111,363.60	- 114,704.51	- 114,704.51	- 114,704.51	- 118,145.64
Management	2%		- 172,992.00	- 194,616.00	- 222,727.20	- 222,727.20	- 222,727.20	- 229,409.02	- 229,409.02	- 229,409.02	- 236,291.29
Others	0.5%		- 43,248.00	- 48,654.00	- 55,681.80	- 55,681.80	- 55,681.80	- 57,352.25	- 57,352.25	- 57,352.25	- 59,072.82
Property yearly tax	0.3%		- 214,944.35	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00
Total management costs			- 1,165,680.35	- 1,347,462.00	- 1,399,912.80	- 1,403,185.28	- 1,406,474.12	- 1,421,472.59	- 1,424,794.40	- 1,428,132.83	- 1,443,531.92
Gross profit after management cost		(71,648,116.44)	7,397,423.65	8,286,030.00	9,625,083.60	9,621,811.12	9,618,522.28	9,934,273.70	9,930,951.89	9,927,613.46	10,252,886.76
Financial statement											
Fund	40%	- 28,659,246.57									
Loan draw down	60%	- 42,988,869.86									
Loan interest	7%	-	- 3,009,220.89	- 2,577,410.01	- 2,109,276.86	- 1,582,830.82	- 1,066,868.06	- 561,183.92			
Profit before Tax		(71,648,116.44)	4,388,202.76	5,708,619.99	7,515,806.74	8,038,980.30	8,551,654.22	9,373,089.78	9,930,951.89	9,927,613.46	10,252,886.76
Tax	20%		877,640.55	1,141,724.00	1,503,161.35	1,607,796.06	1,710,330.84	1,874,617.96	1,986,190.38	1,985,522.69	2,050,577.35
Net Profit		(71,648,116.44)	3,510,562.21	4,566,895.99	6,012,645.39	6,431,184.24	6,841,323.38	7,498,471.83	7,944,761.51	7,942,090.77	8,202,309.41
Loan repayment	90%	-	3,159,505.99	4,110,206.39	5,411,380.85	5,788,065.81	6,157,191.04	6,748,624.64	7,150,285.36		
Out standing loan		(42,988,869.86)	(36,820,142.98)	(30,132,526.58)	(22,611,868.87)	(15,240,972.23)	(8,016,913.14)	(707,104.58)			
Accumulated net profit		- 28,659,246.57	(28,308,190.35)	(27,851,500.75)	(27,250,236.22)	(26,607,117.79)	(25,922,985.45)	(25,173,138.27)	(17,228,376.76)	(9,286,285.99)	(1,083,976.58)

Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
11,814,564.32	11,814,564.32	11,814,564.32	12,169,001.25	12,169,001.25	12,169,001.25	12,534,071.29	12,534,071.29	12,534,071.29	12,910,093.43	12,910,093.43	12,910,093.43
											56,660,309.78
11,814,564.32	11,814,564.32	11,814,564.32	12,169,001.25	12,169,001.25	12,169,001.25	12,534,071.29	12,534,071.29	12,534,071.29	12,910,093.43	12,910,093.43	69,570,403.21
- 118,145.64	- 118,145.64	- 118,145.64	- 121,690.01	- 121,690.01	- 121,690.01	- 125,340.71	- 125,340.71	- 125,340.71	- 129,100.93	- 129,100.93	- 695,704.03
- 118,145.64	- 118,145.64	- 118,145.64	- 121,690.01	- 121,690.01	- 121,690.01	- 125,340.71	- 125,340.71	- 125,340.71	- 129,100.93	- 129,100.93	- 695,704.03
11,696,418.68	11,696,418.68	11,696,418.68	12,047,311.24	12,047,311.24	12,047,311.24	12,408,730.58	12,408,730.58	12,408,730.58	12,780,992.50	12,780,992.50	68,874,699.17
- 674,378.16	- 677,750.06	- 681,138.81	- 684,544.50	- 687,967.22	- 691,407.06	- 694,864.09	- 698,338.41	- 701,830.11	- 705,339.26	- 708,865.95	- 712,410.28
- 118,145.64	- 118,145.64	- 118,145.64	- 121,690.01	- 121,690.01	- 121,690.01	- 125,340.71	- 125,340.71	- 125,340.71	- 129,100.93	- 129,100.93	- 695,704.03
- 236,291.29	- 236,291.29	- 236,291.29	- 243,380.03	- 243,380.03	- 243,380.03	- 250,681.43	- 250,681.43	- 250,681.43	- 258,201.87	- 258,201.87	- 1,391,408.06
- 59,072.82	- 59,072.82	- 59,072.82	- 60,845.01	- 60,845.01	- 60,845.01	- 62,670.36	- 62,670.36	- 62,670.36	- 64,550.47	- 64,550.47	- 347,852.02
- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00	- 355,644.00
- 1,443,531.92	- 1,446,903.81	- 1,450,292.56	- 1,466,103.54	- 1,469,526.27	- 1,472,966.10	- 1,489,200.59	- 1,492,674.91	- 1,496,166.60	- 1,512,836.53	- 1,516,363.22	- 3,503,018.39
10,252,886.76	10,249,514.87	10,246,126.12	10,581,207.70	10,577,784.98	10,574,345.14	10,919,529.99	10,916,055.67	10,912,563.98	11,268,155.97	11,264,629.27	65,371,680.78
10,252,886.76	10,249,514.87	10,246,126.12	10,581,207.70	10,577,784.98	10,574,345.14	10,919,529.99	10,916,055.67	10,912,563.98	11,268,155.97	11,264,629.27	65,371,680.78
2,050,577.35	2,049,902.97	2,049,225.22	2,116,241.54	2,115,557.00	2,114,869.03	2,183,906.00	2,183,211.13	2,182,512.80	2,253,631.19	2,252,925.85	13,074,336.16
8,202,309.41	8,199,611.90	8,196,900.90	8,464,966.16	8,462,227.98	8,459,476.11	8,735,623.99	8,732,844.54	8,730,051.18	9,014,524.78	9,011,703.42	52,297,344.62
(1,083,976.58)	7,115,635.32	15,312,536.22	23,777,502.38	32,239,730.36	40,699,206.47	49,434,830.46	58,167,675.00	66,897,726.18	75,912,250.96	84,923,954.37	137,221,299.00

Table 26: Data Analyzing of the Office Project after Vertical Integration

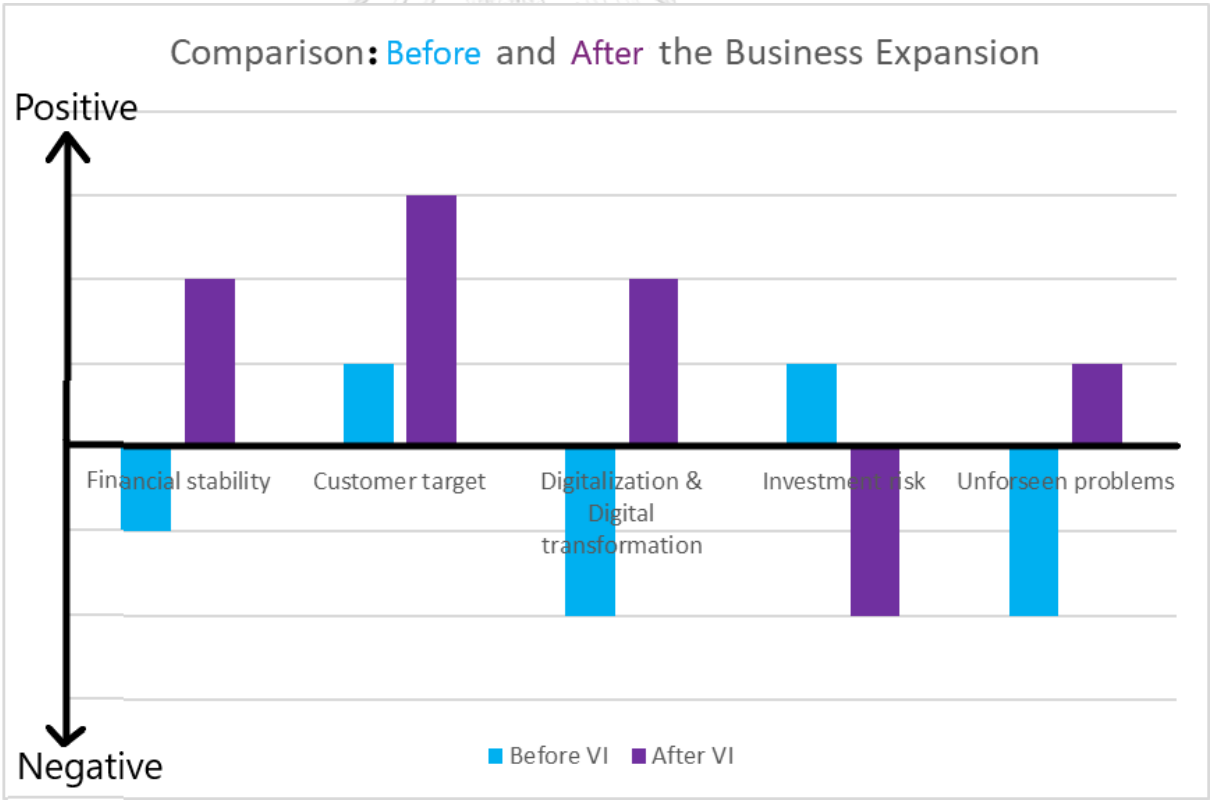
After plugging in the new data into the calculation, there is a huge difference in financial data, as you can see in Table 26. The data that got affected by the vertical integration is highlighted in yellow in year 0. You can see that the amounts of the fund (saving) and the loan that you must have before investing on the project drop significantly. Due to the vertical integration, the initial investment for the project from the company's saving can be reduced from 52,160,186 Thai Baht to 28,659,246.57 Thai Baht, and the amount of the loan from a bank is also reduced from 78,240,278 Thai Baht to 42,988,869.86 Thai Baht. Plus, the reduction in the construction cost, and the maintenance fee making the office project is able to repay all the loan at the beginning of year 7 and pass through the break even point in year 10. The comparison between before and after vertical integration diagrams will show as follows;



Diagrams 6: The Comparison Between with and W/O Vertical Integration Diagram

According to Diagram 6, it shows the comparison of the accumulated net profits of the feasibility studies between the office project without vertical integration that is shown in blue line, the office project with vertical integration that is shown in purple line, and the office project with vertical integration + worst case scenario that is shown in yellow line. The diagram clearly shows the positive impact from the vertical integration. In year 20, with the vertical integration, the project is able to produce about 59.4 million Thai Baht more of the accumulated net profit comparing to the project without VI. Moreover, in year 16, it shows that even when the project without vertical integration reaches to the breakeven point, the project with vertical integration already has about than 60 million Thai Baht of accumulated net profit which is more than the value of the land or the value of the sunk cost of the company. In addition, even if in the worst case scenario when the rental rate of the project

with the vertical integration is only 70 percent throughout 20 years, it is still better than the best case scenario of the project without vertical integration, as it shows in the diagram. The project is able to return all the loans in year 9, reach the break-even point in year 13, and also earns the total of 86.2 million Thai Baht of accumulated net profit in year 20. It proves that the initial investment fund is very effective since you do not have to pay 7 percent of loan interest rate every year. According to Thailand Law Forum, it shows that the company could either make the project in the name of Company-A or in a subsidiary company if Company-A owns more than 24 percent of the subsidiary company because if the company owns less than 24 percent, the company must pay 20 percent of income tax for transferring money between them.



Diagrams 7: Comparison Before and After the Business Expansion

According to diagram 7, it shows the comparison between before and after the business expansion of Company-A. As it shows, there are 5 different criteria from different perspectives which are financial stability, customer target, digitalization & digital transformation, investment risk, and unforeseen problems. As you can see these criteria are created based on the existing problems that Company-A is facing. The financial stability will definitely be improved according to the study. When the company does not have a construction project, the passive income from the real estate project will come in place to help with the operation cost which makes the company more stable and will also increase the net profit of the company in the normal circumstance. Let's make an assumption in the best case scenario that the company is able to create a similar real estate project every 2 years, in 10 years, there would be 5 real estate projects that create passive incomes to the company. According to table 26, the project can return all the loan at the end of year 6 and earn about 8 million Thai Baht of net profit after that, so in this case, at the end of year 16, the company will earn 40 million Thai Baht of net profit annually which would cover almost all of the salary cost of Company-A that is shown in table 3. Even in the worst case scenario when there is only 70% of rental rate throughout 20 years of the chosen project, the project is able to return all the loans just 2 years slower than the best case scenario, so by applying the same assumption, after 18 years, the company would have 28 million Thai Baht of passive income which is 8 million Thai Baht more than the average net profit between 2015 to 2019 of Company-A.

In addition, the customer target will expand from only "B2B" to both "B2B and B2C" since Company-A job is only a part of a final product, and only deals with big corporates, so with this business expansion, the company can reach to end-customers by itself. The real

estate department will bring digital transformation to the company since the customer target is extended. For example, the company now can collect data from the end-customers to improve future projects and the company can also do the online marketing, and use e-commerce platforms like Airbnb, Agoda, and etc to reach more varieties of new customers. Moreover, the company, now, has a right to make a decision on what to build, so the company can choose to put new technologies like EV charging stations, smart building devices, solar panels, and more that would be a great fit to the new generation. Nevertheless, the business expansion may not reduce the existing unforeseen problems in the construction business but as a project developer itself, the company has more flexibility to adapt to the circumstances. For example, the construction death line can be extended, the specification of construction methods and materials can be adjusted to a better way based on a situation, and these would help reduce pressure for contractors and may reduce human errors that may occur during a construction. On the other hand, this business model may increase investment risks since a real estate project requires a lot of initial investment and takes quite some time to pass the breakeven point.

Surely, there is also a risk of failure of this real estate project but the study of the competitors, demands in the area, and the result of the feasibility study make the risk worth taking. It is one of the investments that will grow and come back to the company eventually, and at the time, the passive income from this project would reduce the risks when the company faces with financial problems. Even though the real estate department, at the beginning, would not make a huge positive impact to the company, in a long-term, the real estate department might become the main source of income in the future and most

importantly, this study proved that this business expansion by the vertical integration through existing strength in a construction company works.

9. Effect of Vertical Integration of a Construction Company to a Real Estate Company

9.1 Benefits

Business vertical integration from a construction to a real estate industry can bring numerous advantages to the construction company. First of all, enrollment in real estate would contribute to the reduction of risks that affect the construction industry. For example, managing its own apartments would fulfill some of the construction department's fixed costs from the rental fees of the chosen project. It is highly advantageous in case if the construction company does not have enough projects at a specific period, while the payment obligations are critical. By this we mean salaries to the employees and costs needed to maintain machines and facilities. Rental fees play a role of the financial pillow in such cases and prevent decrease of company's performance. Moreover, it also has positive impacts to real estate business, for example, construction & maintenance costs will definitely be much cheaper which would be a competitive advantage to the business and the operation cost between two businesses will be shared.

Health and safety risks can be also reduced by enrolling in the real estate industry. Therefore, construction companies as a rule resort to different methods that can save their money. Unfortunately, safety measures are in the focus because they always require additional expenditures but may not be needed by the end of the project realization. That is why construction companies often neglect safety expenditures hoping that any serious

accidents will not happen. Real estate provides greater financial stability to the company, so they will be able to fully support their construction projects without a necessity to save on some important aspects of the construction process.

The same refers to quality standards. Frequently, the construction companies resort to the use of cheaper materials then it was expected and it does not always refer to speculations. As prices on the raw materials and labor forces are flexible and often vary, long term construction projects always face risks of project cost increase, especially if they are run in the developing economies. Integration to real estate is helpful in such cases, as the company has passive sources of income (e.g. rental fees) and its interest in high quality construction increases as the project will generate additional profit in the post-production stage. What is more, quality is one of the topical criteria important to a customer, while the real estate industry refers to the B2C model. Summing up, enrollment in real estate can increase the quality standards of the projects offered by the company.

A corporate construction company is highly dependent on national economic development along with the stability of the clients. If some of these factors go wrong, the outcomes have an immediate impact on a construction company. In addition, every construction project has to go through a bidding event to find the company that offers the cheapest prize for the project. This gives only a little overhead for the company that won the bidding and there are also some relative risks. For example, if the company made a mistake in calculations during the estimating prize process from the blueprint and that cost it to obtain the project, it may face bankruptcy as a result. Moreover, many construction companies fail to collect a couple last work period money from their clients which also leads

to serious negative outcomes and may have to find a solution in a court. In overall, the section on risks and challenges analysis, discussed earlier in the paper, proves that contemporary construction companies require enforcement. Real estate is one of the lucrative options to obtain a required enforcement.

Extending business industries from construction to real estate first of all refers to the extending of the target customers' audience. They will include both – real estate companies and the end customers (B2B and B2C). In the other words, an exponential growth is best fit a construction business as there is a possibility to double or triple the sizes of the projects, while the long-term real estate investment is much more sustainable. In such a way, doing both construction and real estate would make a balance in a more positive way. By this we mean that the company can invest in real estate for the profit from construction, and the construction can fulfill the fixed costs from real estate profit.

Eventually, integration to real estate will contribute to the technological updating of the company. The analysis of chosen literature revealed a problem with technological adoption in the construction industry. It was also found that in comparison with the construction industry, the real estate industry adopts technologies rapidly. What is more, both construction and real estate companies benefit from technological advancement to the great extent. However, technologies always bring challenges that would cost a company time and money. First, they have to buy all the required technologies which is additional expenditure. Second, they require adequate transition of the staff to the use of technologies. This process includes different procedures, such as training courses for the staff and involvement of the external experts to communicate the change effectively. Due to income

obtained from the real estate operations, technological updates of the company would be much smoother.

9.2 Risks

Vertical integration to a real estate company is a risky deal. Despite all the benefits, discussed above, the company should jump into the integration only after conducting an analytical analysis of its business, forecasting all the benefits and drawbacks and evaluating possible risks. As it was found, cost and scope of the company should be considered predominantly. What is more, the company should have a clear strategic vision on the integration which refers to the specific objectives and final goal. Poor strategic vision in this case can result in misleading expectations and lead to business crisis. In overall, the integration to a real estate industry would bring numerous positive changes to a construction business if implemented skillfully.

10. Expectation Results and Benefits

The analysis of literature and the project feasibility studies in the discourse of our research topic showed that a construction company will benefit from the vertical integration to a real estate company. Such a result was obtained after achieving all the objectives of the paper. Specifically, it was found that vertical integration has many advantages to business development. Also, the industry of real estate involves numerous prospects to a construction company and helps to mitigate the effect of major risks. Nevertheless, disadvantages and drawbacks also have their place. That is why it is critical to assess a company's profitability and scope and to have a clear well-developed strategy of integration.

The expectation benefits, judging on the achieved results of the assessment are the following:

- ✓ Increase of company's performance;
- ✓ Improvement of company's sustainability;
- ✓ Quicker adoption of technologies;
- ✓ Increase of company's staff (and increase of the percentage of younger employees);
- ✓ Higher level of financial stability;
- ✓ Enrollment in new projects and cooperation with new businesses and customers in the real estate industry;
- ✓ Entering new national and foreign markets;
- ✓ Sustainable growth of business.

REFERENCES

Bank of Thailand. (2020). *Thailand Unemployment Rate - 2001-2020 Data*. Available at: https://tradingeconomics.com/thailand/unemployment-rate

Bank of Thailand. (n.d.). *Help Regulation for Debtors who are Affected by Thai Economics Recession*. Available at: https://www.bot.or.th/Thai/FinancialInstitutions/Pages/FI_Support.aspx

Britannica. (n.d.). *Thailand - land*. Available at: https://www.britannica.com/place/Thailand/Land

Colombo, J. (2014). *Thailand's Bubble Economy Is Heading For A 1997 – Style Crash*. Available at: https://www.forbes.com/sites/jessecolombo/2013/11/04/thailands-bubble-economy-is-heading-for-a-1997-style-crash/#7a99749a1d9b

Countrymeters. (2021). *Thailand population (2021) live*. Available at: https://countrymeters.info/en/Thailand

Daibes, V. (2017). *7 major benefits of investing in real estate*. Mashvisor, available at: https://www.mashvisor.com/blog/benefits-of-investing-in-real-estate/

DDproperty. (2020). *Things Must Know before Paying Land and Building Tax*. Available at: https://www.ddproperty.com/คู่มือซื้อขาย/ขั้นตอนต้องรู้ก่อนจ่ายภาษีที่ดินและสิ่งปลูกสร้าง-21394?utm_source=google&utm_medium=cpc&utm_campaign=con-se-gse-nlc-prop--44013-cmtth1&gclid=CjwKCAiAouD_BRBIEiwALhJH6OzQz4rMwGCFDAgtAWmGI7QvtkYIWR5oSo5XvBZOZj2n45dFrWHSWRoCf5QQAvD_BwE

Derek. (2019). *Thailand Fact - 17 Interesting Facts About Thailand (Formerly Siam)*. Available at: https://everything-everywhere.com/8-facts-about-thailand/

Geoba. (n.d.). *Ranking of the top 100+ Countries by Largest Countries by Area*. Available at: http://www.geoba.se/population.php?ac=Asia

Google Maps [online]. *Property-X, Property-Y, and Property-X*. Available at: https://www.google.com/maps/d/edit?mid=1rSgItkVDN64MbYp6Ia38CbV7mFgeOKiy&usp=sharing [Accessed 2020]

Home loan experts. (n.d.) *Investing in Land: What are its Risks & Benefits*. Available at: https://www.homeloanexperts.com.au/investment-loans/investing-in-land/

Investopedia Staff. Walters, T. (2020). *UnEmployment Rates: The Highest and The Lowest in the World*. Available at: https://www.investopedia.com/articles/personal-finance/062315/unemployment-rates-country.asp

Jones, K. (2018). *4 major challenges facing the construction industry*. Available at: https://www.constructconnect.com/blog/4-major-challenges-facing-the-construction-industry

Jurevicius, O. (2013). *Vertical integration*. Strategic Management Insight, available at: https://strategicmanagementinsight.com/topics/vertical-integration.html

Katharangsiporn, K. (2020). *Land Prices See Sizeable Hike*, available at: https://www.bangkokpost.com/business/1854244/land-prices-see-sizeable-hike

Koeleman, J., Ribeirinho, M., Rockhill, D. Sjodin, E. and Strube, G. (2019). *Decoding digital transformation in construction*. McKinsey Global Institute.

Kpcon.co.th. 2018. [online] Available at: < https://www.kpcon.co.th/about-eng > [Accessed 27 March 2020].

Michael, R. Trines, S. (2018). *Education in Thailand - WENR*. Available at: https://wenr.wes.org/2018/02/education-in-thailand-2

Ministry of Tourism and Sports, Thailand. (2019). *Revenue from Foreign Tourists visiting Thailand*. Available at: https://www.thaiwebsites.com/tourism-income-Thailand.asp

Moore, M. (2018). *Asia: highest youth literacy rate - Statista*. Available at: https://www.statista.com/statistics/586988/asian-countries-with-the-highest-youth-literacy-rates/

Munprasert, S. PhD. (2020). *The effects from Covid-19 pandemic to Thai Economics*. Available at: https://www.krungsri.com/th/plearn-plearn/economic-covid-impact

No Author. (2019). *2020 digital transformation and trends in real estate*. Available at: https://medium.com/@stfalconcom/2020-digital-transformation-and-trends-in-real-estate-6a7c4a5ac188

No Author. (n.d.). *Bangkok City Plan Latest Updated*. Available at: http://cpd.bangkok.go.th/files/admin/bma%20pr_290754-mini02.pdf

Oxford College of Marketing. (n.d.) *What is a PESTEL analysis?*. Available at: https://blog.oxfordcollegeofmarketing.com/2016/06/30/pestel-analysis/

Parameswaran, P. (2020). *Thailand's Protests: Between the Old and the New*. Available at: https://thediplomat.com/2020/09/thailands-protests-between-the-old-and-the-new/

Pornpatmata, M. (2021). *Bangkok train lines map 2020*. Available at: https://www.home.co.th/hometips/topic-9130

Sakai, S. (2020). *Japan retailer pushes limit of retirement age, making 80 the new 65 - Nikkei Asia*. Available at: https://asia.nikkei.com/Business/Retail/Japan-retailer-pushes-limit-of-retirement-age-making-80-the-new-65

Srisawat, Y, PhD. (n.d.). *Corporate Income Tax Rate*. Available at: https://www.itax.in.th/pedia/อัตราภาษีนิติบุคคล/

Stakeholder Map Research. (2019). *Risk management in construction*. Available at: https://www.stakeholdermap.com/risk/risk-management-construction.html

Statista Research Department. (2020). *Number of Smartphone users in Thailand from 2017 to 2019 with a forecast for 2020 to 2025 (in millions)*. Available at: https://www.statista.com/statistics/467191/forecast-of-smartphone-users-in-thailand/

Statistics Research Department. (2020). *Thailand: number of international tourist arrivals 2019*. Available at: https://www.statista.com/statistics/994693/thailand-number-international-tourist-arrivals/

Statistics Times. (2020). *World GDP Ranking 2020*. Available at: http://statisticstimes.com/economy/projected-world-gdp-ranking.php

Stuart, A. (2017). *One Sleep Closer to Home: Housing for Chiang Mai 's Homeless*. Available at: https://www.chiangmaicitylife.com/clg/our-city/city-issues/chiang-mai-homeless/

Stuckey, J. and White, D. (1993). *When and when not to vertically integrate*. McKinsey Global Institute, available at: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/when-and-when-not-to-vertically-integrate

Tarver, E. (2019). *Horizontal vs. vertical integration: an overview*. Available at: https://www.investopedia.com/ask/answers/051315/what-difference-between-horizontal-integration-and-vertical-integration.asp

Thailand Law Forum. (2013). *Enactment in Financial institution by King Bhumibol Adulyadej in 2008*. Available at: http://thailawforum.com/database1/financial-institution-business-2551-thai.html

Trading Economics. (2019). *Thailand GDP - 1960-2019 Data*. Available at: https://tradingeconomics.com/thailand/gdp

United Nations. (2013). *World Mortality Report 2013*. Available at: https://www.un.org/en/development/desa/population/publications/pdf/mortality/WMR2013/World_Mortality_2013_Report.pdf

World Population Review. (2020). *Facebook Users by Country 2020*. Available at: https://worldpopulationreview.com/country-rankings/facebook-users-by-country

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