

FEASIBILITY STUDY OF DEVELOPMENT TELECOMMUNICATION DEVICES REPAIR BUSINESS IN CAMBODIA

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ABSTRACT

PT. X has been operating since 2002, located in South Jakarta. PT. X is a national private company engaged in contractors such as construction of BTS (Base Transceiver Station), Transmission, Microwave, Maintenance of BTS (Base Transceiver Station), and Repair BTS (Base Transceiver Station). From 2002-2019 PT. X succeeded in working on many projects related to it is field and has been trusted by various providers throughout Indonesia. At present the owner wants to expand his area of operations to Cambodia to increase profits. After obtaining data to conduct research, the results of BTS development forecasts showed an annual increase of (3%) in 3 providers in Cambodia. In determining the technical aspects, the location, layout of PT. X in Cambodia, and also the standard operation procedure of PT. X. The financial aspects that take into account of income and expenses in cash flow, the estimated amount of income, the amount of operating costs, the need for investment funds, and profit and loss, to calculate the sensitivity aspects include investment feasibility such as Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PBP) with a set period of 15 months. The results of these calculations show that the level of investment in NPV is 1.069.005,72 USD, IRR is 45%, and the number of months spent until returning to initial capital is 15 months. Due to the results of $NPV > 0$, $IRR 45\% > MARR$ and $PBP < \text{Investment period}$, the repair service of PT. X is declared feasible.

Keywords: Feasibility Analysis, Net Present Value (NVP), Internal Rate of Return (IRR), Pay Back Period (PBP).

1. Background

The development of telecommunications is very rapid from time to time. This development offset the human needs that demand ease and speed in accessing communication, information, scientific data, and entertainment. Human life today is very dependent on telecommunications technology. The rapid growth of technological development is in line with the development of other supporting business tools.

One of the companies engaged in the improvement of telecommunications equipment, namely PT. X, which is a national private company established since 2002, PT.X serves various fields in telecommunications such as construction of BTS (Base Transceiver Station) installations, transmissions, microwaves, and maintenance of BTS (Base Transceiver Station) with the scope of maintenance and repair activities if the BTS (Base Transceiver Station) has a problem.

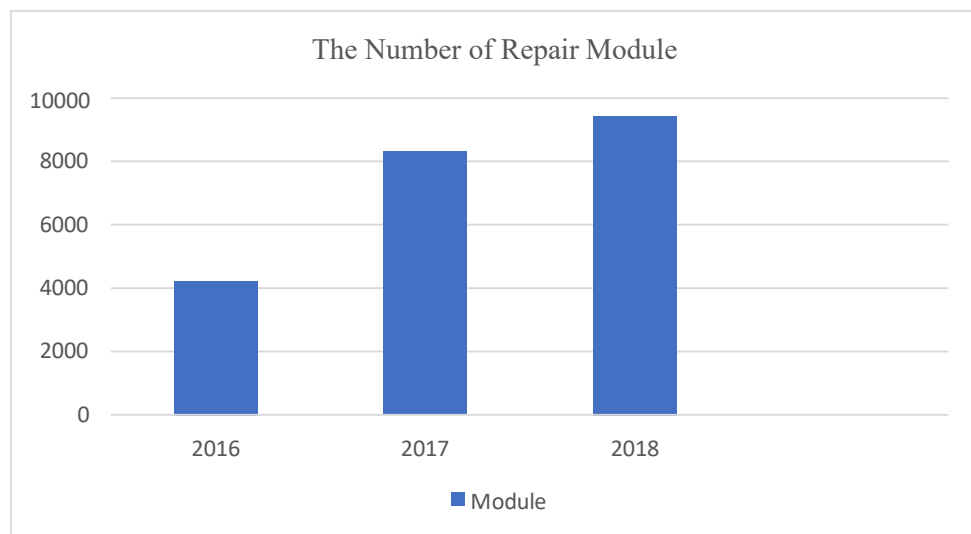


Figure I.1 The number of Repair Module

Based on Figure 1.1, it can be seen that in improving the module of PT. X continues to increase every year from 2016 to 2019. This illustrates that telecommunications equipment repair services are in great demand by provider companies in Indonesia, because with the repair services help companies reduce costs that will be incurred by suppressing the high capital expenditure budget (Capital Expenditure) because the provider company does not need to pay a lot of money to provide a new module, they can easily repair the module that has been provided by PT. X.

Since five years ago, the price of repairing telecommunications equipment in Indonesia has been set in Rupiah (Indonesian Rupiah / IDR). However, the repair component prices are still imported from the United States and China, with a reference price of the United States Dollar or USD.

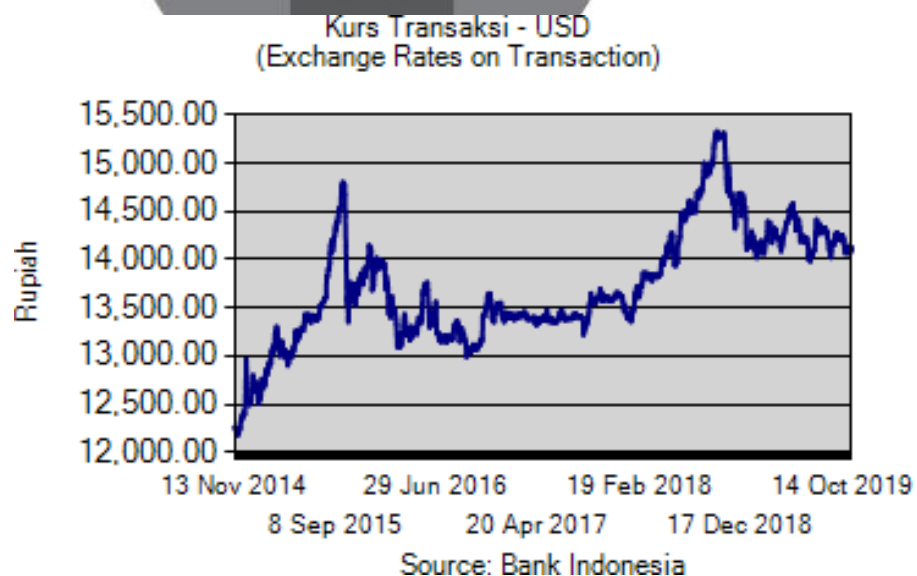
Figure I.2 Rupiah Exchange Rate against Dollar Source: www.bi.go.id (December, 2018).

Figure 1.2 provides data on Rupiah inflation against the dollar. As known, in 2014, the average exchange rate of 1USD = IDR 12,000. And the current exchange rate in 2019, 1 USD = IDR 14,200, - so it appears that from 2014 to 2019, IDR has depreciated by 26%, or 5.2% per year. By the end of 2018, the company had studied the markets and market opportunities in the ASEAN Regional region. One country of concern to this company is the State of Cambodia. With a land area of 181,500 Km² it is inhabited by around 20 million indigenous plus an additional 5 million immigrants from China.

The country of Cambodia is the only country that still enforces "dual currencies" in conducting daily trading transactions, namely with the USD and KHRiel (Khmer Riel). At the moment the exchange rate is 1 USD = KHRiel 4,000. In Cambodia there are nine Fixed-Line Operators and nine Cellular Operators, so competition between operators is very tight. This competition requires telecommunications operators to improve efficiency in various operational lines by pressing Capital Expenditure so that their financial performance will remain good. In this country there are 3 (three) major cellular operators, namely: Smart-Axiata (Smart Card, Malaysian Investor); Cam GSM (CellCard, Local Investor / Cambodia) and; Metfone Viettel (Vietnamese Investor). Based on the Area Coverage of the analysis, the following are calculated: Smart-Axiata has around 25,000 Cell BTS, Cam GSM has around 22,000 Cell BTS and Viettel has around 22,000 BTS, each of which is spread to the borders of Cambodia with its neighbors. So that the total Cell BTS of the three Operators for around 69,000 Cell of BTS, this number represents the potential for more than adequate device repair. Based on the results of researchers' interviews with company owners, in July 2019 PT. X has carried out pre-operational activities to find out whether repair services in Cambodia are feasible or not. The activity is carried out by providing module repair modules that will be repaired as many as three modules. And from the results of these pre-operational activities, conclusions are drawn that repair services are a new field for provider companies there. With this, PT. X believes that their repair services are feasible to be carried out in the State of Cambodia and can also contribute to the additional foreign exchange of the Republic of Indonesia.

2. Literature Review

2.1 Definition of Business Feasibility

Business feasibility is an important aspect in the beginning of making a business in a company. The feasibility of a business carried out by a company is to find out and calculate whether the business to be run can produce profits or losses. Business feasibility analysis is an activity to calculate the extent of profits that can be generated in the context of carrying out business activities to minimize the risks that will be faced in the future according to Susilowati and Haruni (2018). The purpose of the business feasibility study is to find out whether the business is feasible or not to be run according to Tawas et al., (2014).

2.2 Telecommunications Technology

Telecommunications technology is a communication channeled using communication media devices that use electronic and electromagnetic equipment and is useful for obtaining information at any time, getting data in real-time and allowing company operations (both facilities and human resources) to be scattered in various locations according to Asmini and Bambang (2014).

2.3 Aspects of Business Feasibility Study

In the aspect of a business feasibility study is an analysis of a company in conducting business to be carried out, when conducting a business feasibility study the company can avoid any loss or failure of business in the future. In determining aspects of a business feasibility study, they have 5 aspects including:

- A. Market Aspects
- B. Technical aspects
- C. Financial aspects
- D. Sensitivity

2.4 Market Aspects

Market aspects are things that are needed by the company to see how much and analysis of the market to be targeted while the thing being analyzed is the determination of market opportunities and sales targets. The market has 2 aspects to research large markets that are capable of controlling the market.

- A. Forecasting BTS Market
- B. Target Market

In the market aspect, market analysis is needed to be targeted while the thing being analyzed is determining market opportunities and sales targets, determining selling prices, and determining marketing strategies, the following 3 aspects are market analysis that will be targeted:

- A. Determination of market opportunities and sales targets
- B. Determination of Selling Prices.
- C. Determination of Marketing Strategies

2.5 Technical Aspects

The technical aspect is a very important and mandatory aspect for a company in conducting a business feasibility study because to avoid any loss or business failure in the future, from the technical aspect the company can also predict how much the investment costs incurred by the company and its exploitation (Husnan, 2002). According to Kasmir and Jakfar (2003), there are several things that must be fulfilled in carrying out technical aspects, namely:

- A. The company can determine the right location, both for the location of workshops, warehouses, branches, and headquarters.
- B. The company can determine the equipment in accordance with the production process to be selected.
- C. The company can determine the layout in accordance with the selected production process, so that it can provide efficiency.
- D. The company can determine the most appropriate technology in carrying out its production.
- E. The company can determine the best inventory method to run in accordance with their line of business.
- F. Can determine the quality of labor needed now and in the future.

2.6 Financial Aspects

Financial aspects consist of calculation of investment, financial bookkeeping, and measurement of financial statement performance.

- A. The calculation of investment is the costs incurred and used in running a business and the costs incurred can be physical that can be calculated in its depreciation every year.
- B. The preparation of financial statements is useful in analyzing a business. The report used is usually the income statement in the form of financial statements that show the company's profits within the specified time period. And cash flow reports that can describe the amount of funds available at any time that can be used for operational needs of the company.

- C. Financial performance measurement is a business feasibility analysis that can be calculated using the method: break-even point (BEP), payback period (PP), net present value (NVP), and internal rate of return (IRR).

2.6.1. Payback Period (PBP)

Payback Period is an important factor in opening a business because the company can see the time it takes for the company to recoup investment expenses using cash flow. So the payback period is the ratio between initial cash investment and cash inflow which results in time (Umar, 2015). After that this ratio is compared with the maximum payback period received. Payback period formula:

$$\text{Payback Period} = \text{Initial Cash Investment} / \text{Net Cash Inflow}$$

2.6.1.1. Net Present Value (NVP)

$$IRR = NPV = \sum_{t=1}^T \frac{C_t}{(1+r)^t} - C_0 = 0$$

2.6.1.2. Internal Rate of Return (IRR)

$$IRR = P1 - C1 \times \left(- \frac{2-1}{2-1} \right)$$

3. Research Methodology

The conceptual model above, explains the business feasibility analysis influenced from several aspects. Such as market aspects, technical aspects, financial aspects, and business feasibility analysis.



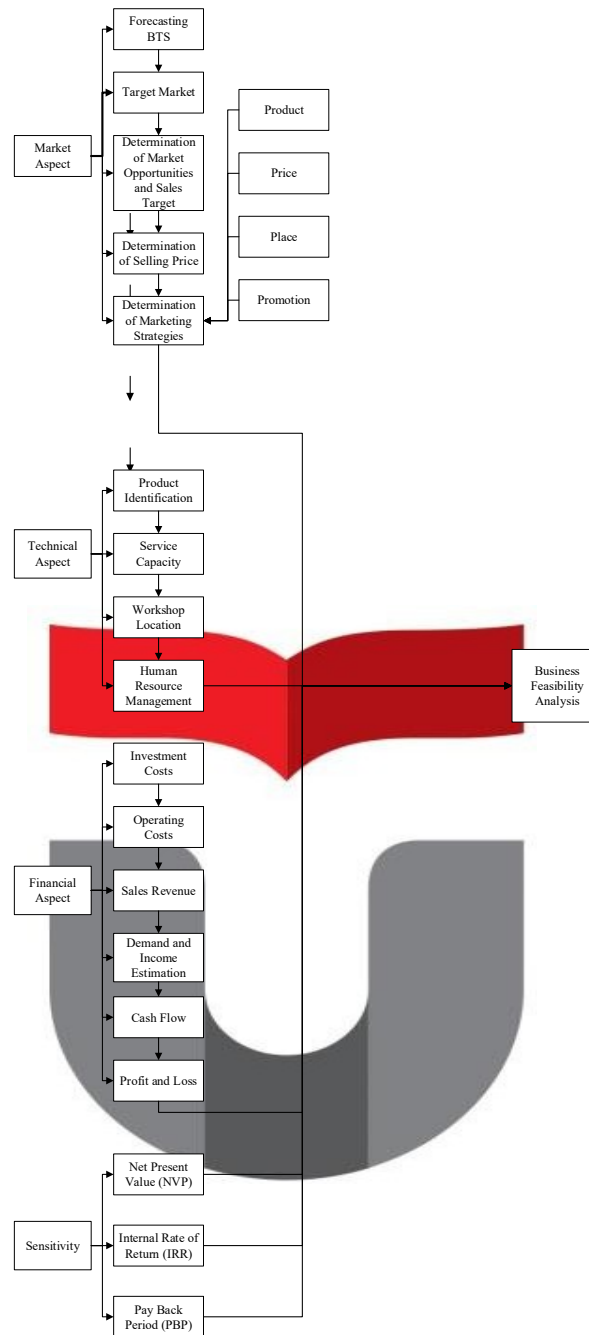


Figure III.1 Conceptual Model

4. Analysis

4.1. Market Aspects

1. Forecasting BTS Market

Variable of interest in PT. X in Cambodia can determine a large forecasting markets. Data obtained from sales forecasts who are interested in using PT. X Repair Services.

Table IV.1 Forecasting BTS in Cambodia

No	Y	X	YX	Y ²	X ² Y	Y ²
2015	61.085	-2	-122.170	4	244.340	16
2016	62.974	-1	-62.974	1	62.974	1
2017	64.922	0	0	0	0	0
2018	66.930	1	66.930	1	66.930	1
2019	69.000	2	138.000	4	276.000	16
Total	324.911	3	19.786	10	630.740	34

Source: Data Internal PT. X (2019)

Stright line trend

$$A = 324.911/5 \quad b = 19.786/10$$

$$A = 64.982 \quad b = 1.979$$

$$A = 64.982 + 1.979x$$

Forecasting for 2022, X=5

$$Y_{22} = 64.982 + 1.979(5)$$

$$Y_{22} = 64.982 + 9.895$$

$$Y_{22} = \mathbf{74.877}$$

Forecasting for 2020, X=3

$$Y_{20} = 64.982 + 1.979(3)$$

$$Y_{20} = 64.982 + 5.937$$

$$Y_{20} = \mathbf{70.919}$$

Forecasting for 2023, X=6

$$Y_{23} = 64.982 + 1.979(6)$$

$$Y_{23} = 64.982 + 11.874$$

$$Y_{23} = \mathbf{76.856}$$

Forecasting for 2021, X=4

$$Y_{21} = 64.982 + 1.979(4)$$

$$Y_{21} = 64.982 + 7.916$$

$$Y_{21} = \mathbf{72.898}$$

Forecasting for 2024, X=7

$$Y_{24} = 64.982 + 1.979(7)$$

$$Y_{24} = 64.982 + 13.853$$

$$Y_{24} = \mathbf{78.835}$$

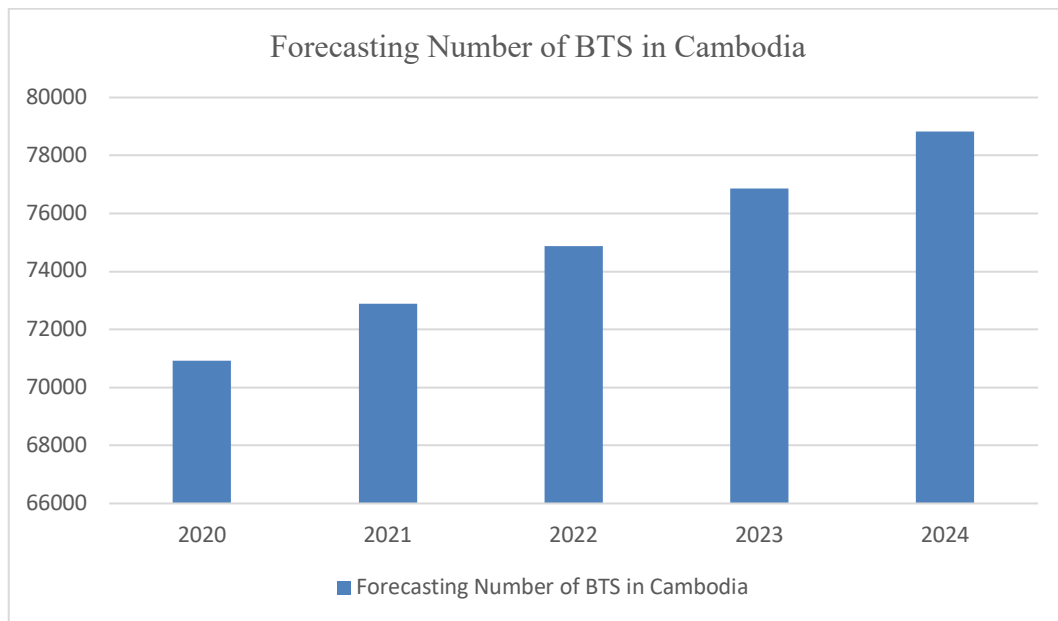


Figure IV.1 Forecast Number of BTS In Cambodia

Based on statistical data calculations from "interested" sales forecast data at PT.X for Population Repair Services of 3 providers in Cambodia. It can be concluded that the sales forecast data (5%) is a forecasting market for PT. X.

2. Target Market

The target market part of the available market that is made as a target in the repair service offer PT. X in Cambodia. By conducting interviews with the owners of repair services of PT. X regarding readiness in entering new markets the owner will target around 5% of the available market, the following are forecast targets for 2020 until 2024.

Table IV.2 Potential Repair Market in Cambodia

Potential Repair market in Cambodia; Top 3 Cellular Operators with Faulty Rate of 5%		5%	(Faulty rate in Indonesia 4% to 6%)
Module/ Goods Installed	Total Number of Rectifiers Installed	Estimated Faulty of 5% per Year	Estimate Faulty per Month
BTS in Years 2020			
Rectifiers in General (1+1 Config)	141.838	7.092	586
Module/ Goods Installed	Total Number of Rectifiers Installed	Estimated Faulty of 5% per Year	Estimate Faulty per Month
BTS in Years 2021			
Rectifiers in General (1+1 Config)	145.796	7.290	607
Module/ Goods Installed	Total Number of Rectifiers Installed	Estimated Faulty of 5% per Year	Estimate Faulty per Month
BTS in Years 2022			
Rectifiers in General (1+1 Config)	149.754	7.488	624
Module/ Goods Installed	Total Number of Rectifiers Installed	Estimated Faulty of 5% per Year	Estimate Faulty per Month
BTS in Years 2023			
Rectifiers in General (1+1 Config)	153.712	7.686	641
Module/ Goods Installed	Total Number of Rectifiers Installed	Estimated Faulty of 5% per Year	Estimate Faulty per Month
BTS in Years 2024			
Rectifiers in General (1+1 Config)	157.670	7.884	657

Source: Internal Data of PT. X (2019)

Based on the data table IV.2, the faulty rate is 5%, the faulty rate is obtained from the number of repairs that have been done in the last two years in Indonesia. It can be concluded that PT. X in Cambodia. In the Rectifiers module, a total forecast in 2020 of 141.838 modules, total forecast in 2021 of 145.796, total forecast in 2022 of 149.754, total forecast in 2023 of 153.712 and in 2024 total forecast of 157.670, the figure is obtained from the calculation of the top 3 providers in the State of Cambodia. PT. X faulty rate of 5% of the total forecast in 2020 of 141,838 modules, which is 7.092 modules in one year and 591 modules rectifiers per month and the total forecast in 2021 of 145.796 modules, which is 7.290 modules in one year and 607 modules Rectifiers per month, total

forecast in 2022 of 149.754 modules, which is 624 module rectifiers per month, total forecast in 2023 of 153.712 modules, which is 7.686 modules in one year and 641 per month and in total forecast 2024 of 157.670 module, which is 7.884 modules in one year and 657 per month which can be repaired by PT. X.

4.2. Technical Aspects

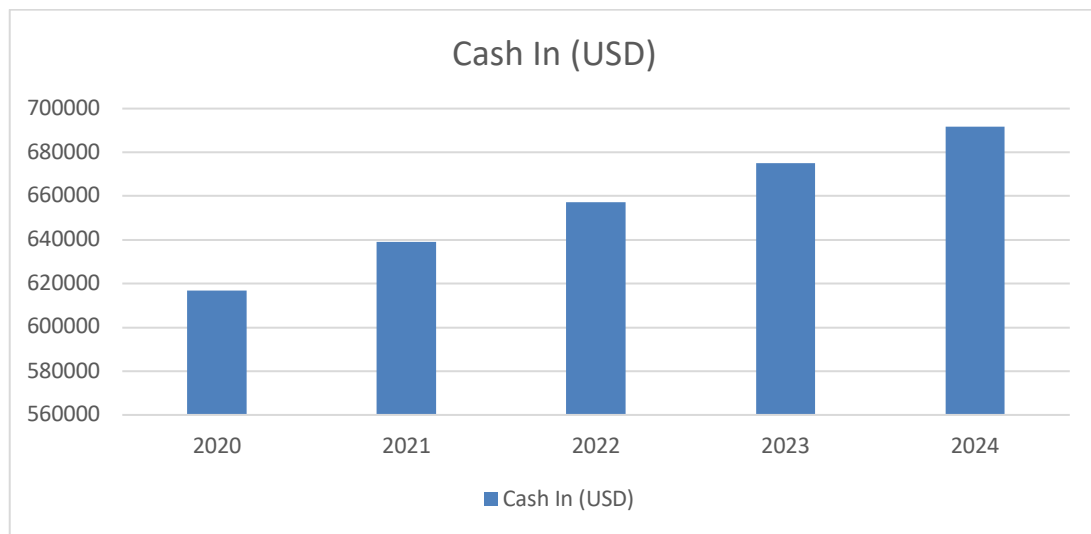
4.2.1. Evaluation of Service Capacity

With the equipment in accordance with the needs that have been provided by PT. X and the count that has been made by PT. X Indonesia market aspects obtained by 5% module rectifier with that number PT. X estimates the estimated market aspect in Cambodia by 5% module rectifier. The amount of repair that will be done by PT. X in one year amounted to in 2020 of 7.032 module rectifier, in 2021 of 7.284 module rectifiers. In 2022 of 7.488 module rectifiers, in 2023 of 7.692 module rectifiers, and in 2024 is 7.884 module rectifiers of 3 providers in Cambodia

4.3. Financial Aspects

An important aspect in assessing company performance is the financial aspect. From the analysis of financial aspects, it can be seen that the company's financial position in the next 5 years or more so that improvements can be made if there are financial differences. The price of the services provided by PT. X by 30% -35% cheaper than the new price, and the results of the forecast business sales PT. X in Cambodia is very interesting to do.

4.3.1. Estimated Financial Aspects



4.3.2. Profit and Loss Analysis

ACCUMULATED INCOME (LOSS)	\$ -17,514.14	\$ -33,900.31	\$ -50,286.48	\$ -67,800.62	\$ -84,186.79	\$ -100,572.96	\$ -79,124.72	\$ -57,673.51	\$ -36,222.30	\$ -14,774.06	\$ 6,677.15
	\$ 28,128.36	\$ 49,576.60	\$ 71,027.81	\$ 92,479.02	\$ 113,927.26	\$ 135,378.47	\$ 156,829.68	\$ 177,959.66	\$ 200,272.72	\$ 222,585.78	\$ 243,715.76
	\$ 266,028.81	\$ 288,341.87	\$ 309,471.85	\$ 331,784.91	\$ 354,097.97	\$ 376,411.03	\$ 398,724.09	\$ 421,037.15	\$ 443,350.21	\$ 465,663.27	\$ 487,976.33
	\$ 509,672.44	\$ 536,361.14	\$ 563,050.21	\$ 589,739.27	\$ 616,428.33	\$ 643,117.39	\$ 669,806.45	\$ 696,495.51	\$ 723,184.57	\$ 749,873.63	\$ 776,562.69
	\$ 804,928.52	\$ 820,225.33	\$ 844,334.90	\$ 869,631.71	\$ 894,928.52	\$ 920,225.33	\$ 945,522.14	\$ 970,818.95	\$ 996,115.75	\$ 1,021,412.56	\$ 1,046,709.37
	\$ 1,046,709.37	\$ 1,072,006.18	\$ 1,097,302.99	\$ 1,122,599.80	\$ 1,147,896.61	\$ 1,174,193.41	\$ 1,201,118.22	\$ 1,227,729.03	\$ 1,254,339.84	\$ 1,280,950.65	\$ 1,307,561.46
	\$ 1,334,172.23	\$ 1,360,782.99	\$ 1,387,393.75	\$ 1,413,904.51	\$ 1,440,415.27	\$ 1,466,926.03	\$ 1,493,436.79	\$ 1,519,947.55	\$ 1,546,458.31	\$ 1,572,969.07	\$ 1,600,000.00

4.4. Sensitivity and Risk

NPV & PBP						
YEAR	2019	2020	2021	2022	2023	2024
Period	0	1	2	3	4	5
Initial Cash Flow (Cash Out)	\$ 218.682	\$ 305.818	\$ 318.160	\$ 325.859	\$ 335.685	\$ 359.233
Operational Cash Flow (Cash In)	\$ -	\$ 616.795	\$ 639.171	\$ 657.072	\$ 674.973	\$ 691.821
Net Cash	\$ -218.682	\$ 310.977	\$ 321.011	\$ 331.213	\$ 339.288	\$ 332.588
p/f factor (8.41%)	1.0000	0.9224	0.8509	0.7849	0.7240	0.6678
NPV	\$ -218.682	\$ 286.852.85	\$ 273.137.70	\$ 259.956	\$ 245.635.21	\$ 222.105.61
NPV Cumulative	\$ -218.682	\$ 68.171.20	\$ 341.308.89	\$ 601.265	\$ 846.900.11	\$ 1.069.005.72
	Interest Rate	8.41%				
	NPV	\$ 1.069.005.72				

4.4.1. Analysis of Internal Rate of Return (IRR)

IRR						
TABLE OF INTERPOLATION CALCULATION						
Year	2019	2020	2021	2019	2020	2021
Net Cash	\$ -218.682	\$ 310.977	\$ 321.011	\$ 331.213	\$ 339.288	\$ 332.588
p/f factor 8.41%	1.0000	0.9224	0.8509	0.7849	0.7240	0.6678
NPV	(218.681,66)	286.852,85	273.137,70	259.956,00	245.635,21	222.105,61
NPV Cumulative	\$ -218.681,66	\$ 68.171,20	\$ 341.308,89	\$ 601.264,90	\$ 846.900,11	\$ 1.069.005,72
Net Cash	\$ -218.681,66	\$ 310.977,18	\$ 321.011,31	\$ 331.213,39	\$ 339.287,61	\$ 332.587,75
p/f factor 10%	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
NPV	\$ -218.681,66	\$ 282.706,52	\$ 265.298,60	\$ 248.845,52	\$ 231.738,00	\$ 206.510,82
NPV Cumulative	\$ -218.681,66	\$ 64.024,87	\$ 329.323,47	\$ 578.168,99	\$ 809.907,00	\$ 1.016.417,82
IRR	45%					

4.4.2. Pay Back Period Analysis (PBP)

NPV & PBP						
YEAR	2019	2020	2021	2022	2023	2024
Period	0	1	2	3	4	5
Initial Cash Flow (Cash Out)	\$ 218.682	\$ 305.818	\$ 318.160	\$ 325.859	\$ 335.685	\$ 359.233
Operational Cash Flow (Cash In)	\$ -	\$ 616.795	\$ 639.171	\$ 657.072	\$ 674.973	\$ 691.821
Net Cash	\$ -218.682	\$ 310.977	\$ 321.011	\$ 331.213	\$ 339.288	\$ 332.588
p/f factor (8.41%)	1.0000	0.9224	0.8509	0.7849	0.7240	0.6678
NPV	\$ -218.682	\$ 286.852,85	\$ 273.137,70	\$ 259.956	\$ 245.635,21	\$ 222.105,61
NPV Cumulative	\$ -218.682	\$ 68.171,20	\$ 341.308,89	\$ 601.265	\$ 846.900,11	\$ 1.069.005,72
	Interest Rate	8,41%				
	NPV	\$ 1.069.005,72				
	Payback Period	0,762				

4.4.3. Sensitivity of Declining Number of Markets

IRR						
IRR If the total market is 5% and reduced by a 2% reduction in market opportunities						
TABLE OF INTERPOLATION CALCULATION						
Year	2019	2020	2021	2022	2023	2024
Net Cash	\$ -218.682	\$ 126.049	\$ 175.648	\$ 178.368	\$ 188.962	\$ 205.773
p/f factor 8.41%	1.0000	0.9224	0.8509	0.7849	0.7240	0.6678
NPV	(218.681,66)	116.271,03	149.453,22	139.994,14	136.803,18	137.417,21
NPV Cumulative	\$ -218.681,66	\$ -102.410,62	\$ 149.453,22	\$ 139.994,14	\$ 276.797,32	\$ 137.417,21
Net Cash	\$ -218.681,66	\$ 126.049,43	\$ 175.648,31	\$ 178.368,39	\$ 188.961,61	\$ 205.772,75
p/f factor 10%	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
NPV	\$ -218.681,66	\$ 114.590,39	\$ 145.163,89	\$ 134.010,81	\$ 129.063,32	\$ 127.768,69
NPV Cumulative	\$ -218.681,66	\$ -104.091,27	\$ 41.072,62	\$ 175.083,44	\$ 304.146,76	\$ 431.915,44
IRR	10%					

4.4.4. Sensitivity of decrease in Selling Price

IRR						
Decrease in selling price if the selling price is reduced by 20%						
TABLE OF INTERPOLATION CALCULATION						
Year	2019	2020	2021	2022	2023	2024
Net Cash	\$ -218.682	\$ 177.828	\$ 183.177	\$ 189.799	\$ 194.293	\$ 204.224
p/f factor 8.41%	1.0000	0.9224	0.8509	0.7849	0.7240	0.6678
NPV	(218.681,66)	164.033,23	155.859,39	148.965,87	140.662,69	136.382,77
NPV Cumulative	\$ -218.681,66	\$ -54.648,42	\$ 155.859,39	\$ 304.825,26	\$ 140.662,69	\$ 136.382,77
Net Cash	\$ -218.681,66	\$ 177.828,43	\$ 183.177,31	\$ 189.799,39	\$ 194.292,61	\$ 204.223,75
p/f factor 10%	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
NPV	\$ -218.681,66	\$ 161.662,21	\$ 151.386,21	\$ 142.599,09	\$ 132.704,47	\$ 126.806,88
NPV Cumulative	\$ -218.681,66	\$ -57.019,45	\$ 94.366,76	\$ 236.965,85	\$ 369.670,31	\$ 496.477,19
IRR	11%					

3. Conclusions

The results of the study of the Feasibility Study of the Business Development Center for Telco Equipment Repair in the Kingdom of Cambodia with the innovation of repairing telecommunications equipment at affordable prices and providing a three- month guarantee on Street 371, Phnom Penh, Cambodia can be summarized as follows:

1. Market Aspects
 - a. Forecasting Number BTS
 - b. Target Market
2. Technical aspects
3. Financial aspects
4. Sensitivity and risk analysis

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