ISSN No:-2456-2165

Calibrator Investment Analysis in Pharmaceutical Equipment Distributor Companies

Triathma Riathma Reynanda
Mercu Buana University
Jakarta, Indonesia

Rosalendro Eddy Nugroho
Mercu Buana University
Jakarta, Indonesia

Abstract:- Excellent service is an important aspect of determining commercial success, especially in organizations engaged in services. Excellent service is the spearhead in capturing opportunities and understanding consumers or clients who will use the services offered. This research was conducted at Pharmaceutical industrial equipment distributor companywhich is the Sole Agent for filters ("M") in the pharmaceutical field in Indonesia. The lifetime of the filter is generally determined from several factors, namely the delta pressure, flowrate and others. These factors can be determined or calculated by means of an integrated test (Paltronic) which must be calibrated every year. To improve the quality of service the company plans to buy a new calibrator unit. To find out whether this investment is feasible or not, in this study the capital budgeting method is used to analyze the feasibility of investing in the purchase of a new calibrator unit, using calculations on capital budgeting (NPV, IRR, PBP). The company sets the interest rate used at 20% and the investment period of the calibrator unit is not more than 5 years.

Keywords:- *Excellent Services, Calibrator, Investment.*

I. INTRODUCTION

Excellent service is an important aspect of determining commercial success, especially in organizations engaged in services. Excellent service is the spearhead in capturing opportunities and understanding consumers or clients who will use the services offered. It is not uncommon if potential customers or clients are reluctant to use the services offered or are reluctant to reuse services in a company because they consider the services provided to be unsatisfactory and friendly.

This will certainly cause harm to the success of the organization. Conversely, by providing excellent service, the organization is able to understand potential customers or clients, able to sell their services, able to act effectively, so as to cause satisfaction for customers and yourself. If everyone in the organization is able to understand and provide excellent service, there will be many good opportunities that can be grabbed and captured together so that it benefits the organization and all parties involved.

Pharmaceutical industrial equipment distributor companyis the Sole Agent for filters ("M") in Indonesia. "M" filter itself consists of several fields such as oil and gas, pharmaceuticals and food. Pharmaceutical industrial equipment distributor companybecomes the sole agent for filter "M" in the pharmaceutical field, both for production and utility filters. The lifetime of the filter is generally determined by several factors, namely the delta pressure, flowrate, integrity test results and others. Integrity test results are calculated using the Unit Integrty Test.

Figure 1. Integrity Test Tool

Figure 1. is an integerty test tool used to check filter conditions. Besides aiming to determine whether the filter can still function properly or not, this tool is also a valid proof parameter to BPPOM regarding the eligibility of the filter used. At present the unit integrity test has reached a population of more than 100 units.

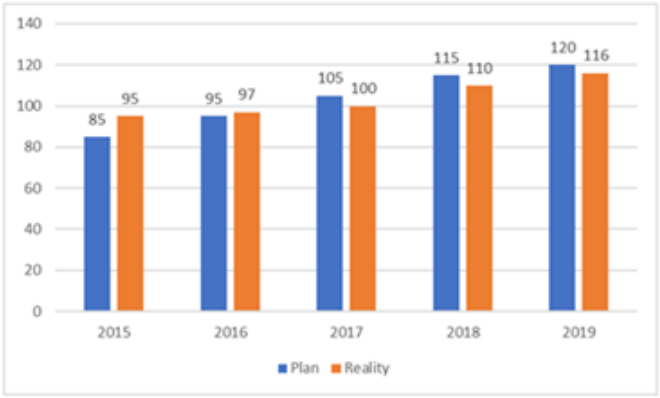

Figure 2. The number of PT Pharmaceutical industrial equipment distributor company's Integrity Test tools

From Figure 2. it is explained that the company has a unit integrity test growth plan that continues to increase this is in line with the reality of the integrity of the unit test growth in the field even though the reality figure is not the same as the plan number but the unit integrity unit test continues to increase from year to year. This is in line with

ISSN No:-2456-2165

the increasing regulation of BPPOM related to the use of sterile filters in the pharmaceutical industry.

Figure 3. Calibrator Tool

Figure 3.is a display of the calirator unit (K Box). The integrity test unit itself has a due date that must be calibrated every year. This aims to ensure that the integrity test tool used is still precise or accurate in checking the condition of the filter. The calibration of the integrity test was carried out using a calibrator (Blue Box) which was carried out in the Pharmaceutical industrial equipment distributor companylab itself.

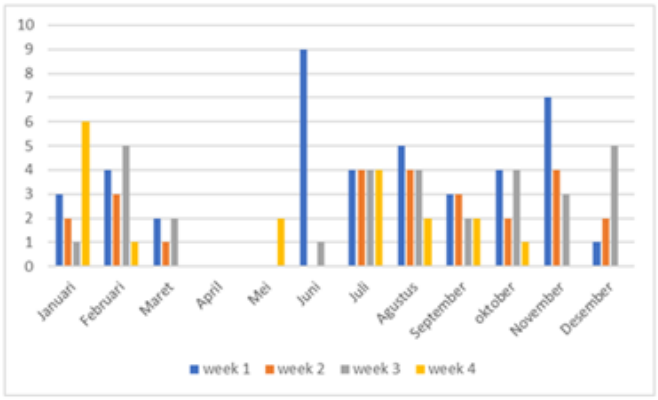

Figure 4. Calibrate Unit Integrity Test Every Month

From the data in Figure 4.it shows that the population integrity test in Indonesia has a respective score to be calibrated. This also cannot be manipulated. Because the duedate integrity test itself is determined or removed from the manufacture. Therefore the company is currently having trouble calibrating the "M" tronic that is due to be duedate while the calibrator is being calibrated. At present, Pharmaceutical industrial equipment distributor companyalready has 1 calibrator unit (K Box), but the same goes for the calibrator unit (K Box) itself, which must also be calibrated, where the unit calibration (K Box) is carried out in the country of origin of the manufacturer in Germany. Due to the variety of calibration units calibrated duedate schedules each month, even if the calibration time is not certain every month, there is a buildup of calibration schedule so that the calibration order is pending at a certain time as described in Figure 5.

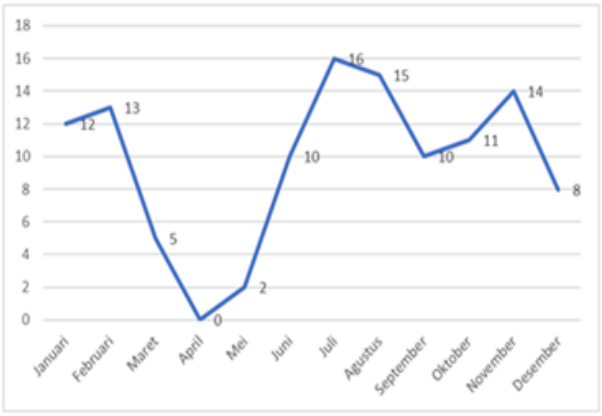

Figure 5. Integrity Test Unit Calibration Chart Graph Every Week (March 2019)

This situation results in the accumulation of the calibration unit calibration schedule that is available to customers in Indonesia when or where the calibrator unit (K Box) is being calibrated which falls due due in April each year. Therefore the calibrator unit (K Box) is sent to Germany's origin country to be calibrated for approximately 3 months from March to May.

The next problem occurs when there is a unit integrity test that has finished due date when the calibrator unit (K Box) is being calibrated. This results in process constraints on consumers where they must use an integrity test tool to determine whether their filters are used in the production process whether they can still be used or not. Every year a similar problem occurs due to the late arrival of the calibrator unit. Late arrivals affect the calibration delays that continue to occur each year, as described in Figure 6.

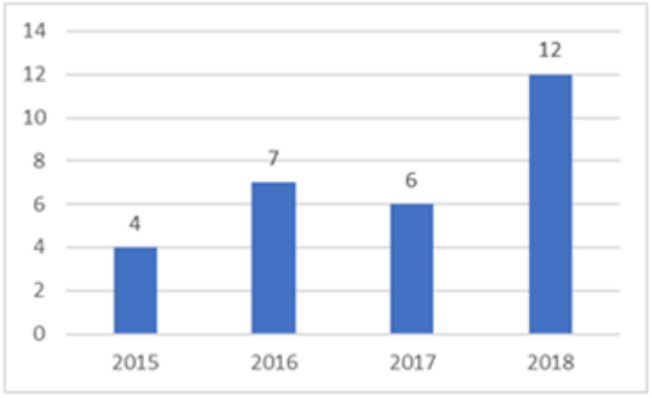

Figure 6. Graph Late annual unit integrity test calibration

In Figure 6. it can be concluded that the number of calibration delays that result in customer complaints is fluctuating. This is caused by the uncertainty of the arrival of the calibrator after being calibrated. The highest peak in 2018 is 12 customer complaints that entered the company related to the calibration delay, which affected the production schedule at the customer. To overcome this, the company plans to purchase a new calibrator as a back up when Calibrator 1 is being calibrated and back up in case of calibrator damage so that the calibration activity is not interrupted.

ISSN No:-2456-2165

Apart from the number of unit integrity test calibration delays as shown in Figure 4. The company considers that there will also be a risk of damage to the calibrator unit (Blue Box) because the calibrator is more than 12 years old. Therefore, the company is considering purchasing a new calibrator unit by looking at the costs and income gained from purchasing a new calibrator unit. The plan to purchase a calibrator unit becomes more complex because there are 3 choices of calibrator grade for the purchase plan to be made.

	Grade A	Grade B	Grade C
Price	3 M	2 M	1 M
Calibration Speed	3 Hours	5 Hours	6 Hours

Table 1. Price comparison of the calibrator unit with the calibration speed

From table 1.1 it is explained that each grade of the calibrator has a different price and calibration speed. This is one of the factors that companies pay attention to in making purchasing decisions.

The identification of the problems of this research is 1. Fluctuation calibration unit calibration time (Figure 4.), 2. There is no back up calibrator, 3. The demand for calibration which continues to increase every year (Figure 2.).

The research problems are 1. How is the investment decision analysis to be carried out at Pharmaceutical industrial equipment distributor company?

2. Is the addition of a calibrator feasible?

The purpose of this study is 1. To find out the analysis of investment decisions that will be made 2. To see whether purchasing a new calibrator is feasible.

The limitations of the problem of this research is within the scope of investment decision-making calibrators at Pharmaceutical industrial equipment distributor companyJakarta with the capital budgeting approach and investment decision analysis.

II. LITERATURE REVIEW

A. Investment

According to Jogiyanto (2012), investment is the delay in consumption now to be put into productive assets for a certain period of time. With productive assets, delaying current consumption to invest in these productive assets will increase total utilization.

B. Business feasibility study

According to Kasmir and Jakfar (2012:7), Business feasibility study is an activity that studies deeply about a business or business that will be run, in order to determine whether or not the business is feasible to run.

C. Objectives of a business feasibility study

According to Husnan and Muhamad (2000), the purpose of the feasibility study is to avoid investing too much for activities that turn out to be unprofitable. Of course this feasibility study will cost money, but the cost is relatively small when compared to the risk of failure of a project involving large investment.

D. Capital Budgeting

According to BambangRiyanto (2004: 120), Capital Budgeting is the whole process of planning and decision making regarding the release of funds whose repayment period exceeds one year or is long-term.

E. NPV method

According to R. AgusSartono (2010: 195), Net Present Value is the difference between the present value of net cash flow or often also called procceed with investment present value.

F. Internal Rate of Return (IRR)

According to Kasmir (2003: 157), Internal Rate of Return (IRR) is to measure the feasibility of an investment based on interest rates that can make the amount of present value of the expected benefits equal to the total present value of capital costs (NPV = 0). In this method, the time value of money has been calculated so that the cash flows received have been discounted on the basis of the capital cost or interest rate applied.

G. Payback Period Method

According to Dian Wijayanto (2012: 247), Payback Period is the period needed to recoup investment expenses (initial cash investment).

H. Framework

The Integrity Test tool is an important component in the sustainability of production in the pharmaceutical field. Because this integerty tool will be used for filter use, whether the filter can still be used or not. Therefore this integerty tool must always be prime and certainly calibrated. In order to accurately determine the filter conditions and meet the requirements for production, each tool used for measurement must be calibrated.

The integrity unit calibration itself uses a calibrator ("K" Box) owned by Pharmaceutical industrial equipment distributor company. The calibrator itself is also a measurement tool which also requires calibration. Calibration of the calibrator unit is carried out in Germany in the country of origin of the calibrator. The next problem occurs when a paltronic unit has finished due date when the calibrator unit ("K" Box) is being calibrated. This results in process constraints on consumers where they have to use the integerty test (Paltronic) tool to find out whether their filters are used in the production process whether they can still be used or not.

Every year a similar problem occurs due to the late arrival of the calibrator unit. Apart from the number of delays in the calibration of the palltronic unit as shown in Figure 4. the company assessed that there would also be a risk of damage to the calibrator unit ("K" Box) because given the age of the calibrator it was more than 12 years. Therefore, the company is considering purchasing a new calibrator unit by

looking at the costs and income it receives from purchasing a new calibrator unit.

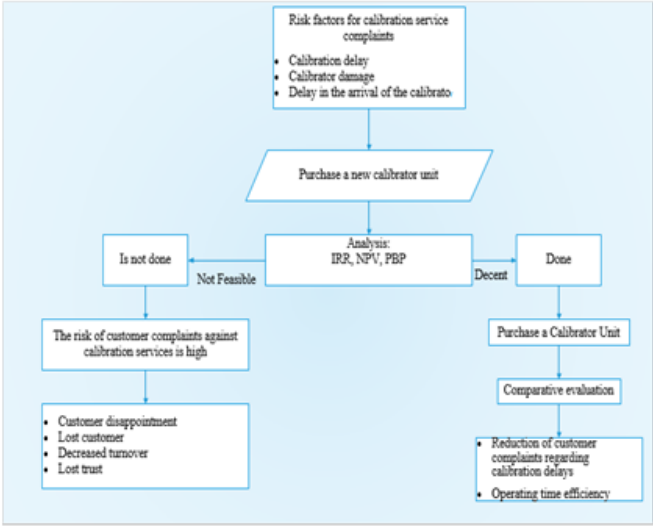

Figure 7. Framework

III. METHODOLOGY

This research focuses on investment feasibility studies of calibrators who apply quantitative research method patterns based on the Capital Budgeting method by calculating NPV (net present value), IRR (internal rate of rating) and PP (payback period) and decision making analysis.

This type of research is a descriptive analysis research with quantitative research methods.

Operational variable research service quality at Pharmaceutical industrial equipment distributor company.

No	Variable	Dimension	Indicator
1	Appropriateness	NPV	Present value with bank interest rates
		PP	Year of return
		IRR	Present value interest rates
2	Risk	Company Risk	Impac that was created
		Individual Risk	
		Market Risk	

Table 2. Operational Definition and Variable Measurement

In this study, the population is all unit integrity tests that exist in customers throughout Indonesia until March 2019.

The sample is part of the number of characteristics possessed by the population. The size of the sample is strongly influenced by many factors including the research objectives.

In this study researchers used nonprobability sampling.

The types of data needed are secondary data relating to the research object. Sources of data and information relating to the problem in this study are data relating to the above theme:
Secondary data is data obtained from indirect sources that have been made previously and used for the research process. Sources of data needed in the study include:

a. Number of tools data
b. Unit integrity test calibration data
c. Unit integrity test calibration delay data
d. Calibrator unit price data tools with calibration speed

The study was conducted with primary and secondary data collection techniques obtained from existing information and in the form of reports or historical data that has been collected.

1. Secondary data collection includes:

1) Study documents

The document study was carried out by searching for information on the calibration department documents at Pharmaceutical industrial equipment distributor company in 2019

2) Literature study

Literature study is done by collecting information from books, articles, and other data sources relating to the research conducted

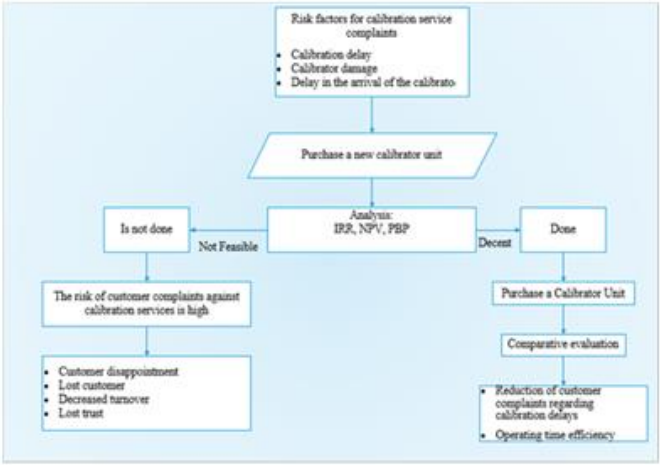

Figure 8. Flowchart of Research Data Analysis

Theoretically, Capital budgeting is an analysis used to analyze the feasibility of a project or investment (capital investment) in the long run that is expected to generate profits in the future. Which is the actual investment that must be received and deserves to be allocated funding from the company? Capital budgeting aims to make investment decisions with a variety of comprehensive considerations so that the funding decisions made benefit the company while providing benefits to shareholders.

ISSN No:-2456-2165

The method used in making investment decision analysis (Capital Budgeting) and what is generally known is there are 3 methods, namely:

1) Payback Period (PBP)
2) Internal Rate of Return (IRR)
3) Net Present Value (NPV)

Payback Period (Payback Period) is a method used to calculate the length of time needed to return money that has been invested from the yearly cash flow (Proceeds) generated by the investment project, the method can be calculated using the formula in equation (2.4). In this method the calculation results will be obtained every year. where there will be a decrease in investment capital every year so that it will get a positive value. The positive value is the result of the calculation of the payback period method which shows the return on capital for what year. An investment is said to be feasible if the payback period value is below the set value, in this case the company applies for the payback period value for calibrator unit investment does not exceed 5 years. If the value obtained is more than what the company sets at 5 years then this investment is not feasible or needs to be reconsidered.

The Internal Rate of Return (IRR) method is basically a method for calculating the interest rate that can equate the present value of all cash inflows with cash outflows from an investment project. Then in principle this method is used to calculate the actual rate of return. Basically the Internal Rate of Return (IRR) must be sought by trial and error. The value of IRR trial and error will get negative and positive results in the process, the calculation will get the final results every year, the value of each year is reduced from year 0 to year 5. If the final results are more than 0 then the interest rate or IRR used in trial and error is included in the criteria for investment. If the opposite result is less than 0, then the interest rate taken is not suitable for investment in the range between positive and negative values so that the cash flow value is equal to 0. If you get a trial and error IRR value is more than determined by the company, the investment is feasible. In this case the company takes an IRR rate of 20%, referring to the current bank interest rates

NPV (Net Present Value) - Net Present Value or often abbreviated as NPV is the difference between the present value of incoming cash flows and the present value of cash outflows at a specified time period. This NPV or Net Present Value estimates the present value of a project, asset or investment based on expected future cash inflows and cash outflows adjusted for the interest rate and initial purchase price. Net Pressent Value uses the initial purchase price and time value of money to calculate the value of an asset. Thus, it can be said that the NPV is the present value of the assets reduced by the initial purchase price.

IV. RESULTS AND DISCUSSION

A. Results.

Based on the results of research conducted obtained the following results:

Table 3. Research Results

Indicator	Parameter	Grade		
		A	B	C
Time	Efficiency	513 Hours (44%)	679 Hours (26%)	762 Hours (17%)
MPP	5 Years	5 Years 3 Months	3 Years 1 Month	1 Year 9 Months
NPV (20%)	> 0	< 0, (-)	> 0, (+)	> 0, (+)
IRR	> 20%	15,7%	32,4%	58,9%

The addition of new tools can affect the calibration performance at Pharmaceutical industrial equipment distributor company because the addition of a new calibrator will certainly reduce work time and minimize delays. As explained in the table above for the addition of grade A calibrators with a calibration time of 3 hours can complete the calibration with 513 hours with an off time of 3 months from October to December, as well as grade B with a time of 679 hours and grade C with a time of 762 hours. For the addition of grade A calibrators can reduce work time by 44%, grade B by 26% and garde C by 17%. From the previous time, there were only 928 hours of calibrators per year.

Cost comparison with the addition of a new calibrator to the calibration process at Pharmaceutical industrial equipment distributor company for operational costs from year 0 to year 10 for each grade of the calibrator does not differ much this because only differ for the calibration operational time which is correlated with the electricity costs needed.

The addition of calibrators is appropriate for Grade B and Grade C calibrators, because all indicators meet the requirements. In contrast to Grade A calibrators in terms of time efficiency, it is very far to be efficient at 44%, but from the NPV indicator with a percent interest rate of 20%, the value obtained is less than 1 or said to be negative.

Table 4. Speed of Calibration

	Grade A	Grade B	Grade C
Calibration Speed	3 Hours	5 Years	6 Hours

In terms of MPP for each grade of calibrator, of course C calibrator has a relatively short payback period. This is because the price of the C grade calibrator itself is cheaper compared to other grades even though with the consequence of not so much time efficiency that is only 17%. Because MPP Grade A from year to year has increased, but the value of MPP Grade A is not feasible. MPP Grade B from year to year has increased and the value of MPP Grade B is feasible

ISSN No:-2456-2165

and MPP Grade C from year to year has increased and the value of MPP Grade C is feasible.

Discussion

A. Capital Budgeting

Capital budgeting analysis which is one method to see whether a business / investment can be said to be feasible or not. In this analysis, the first thing to do is to calculate the overall company costs related to the business / investment that will be carried out including employee salaries, operational costs, calibration costs, etc.

No.	Position	Total	Educational Stage	1 Month (20 Days)			Total Monthly Salary (RP)
				Basic Salary (RP)	Meal Allowance (RP)	Money Transport (RP)	
1	Technical	1	S1	5,500,000	400,000	500,000	6,400,000

Table 5. Company Costs

Based on table 5,company employees involved in the procurement of this calibrator are only 1 person, namely technical for the calibrator. In this case the company considers that the most significant role in the operation of the calibrator and calibration activities is technical. At Pharmaceutical industrial equipment distributor company technical with a bachelor's level of education, they get a monthly net salary of Rp.5,500,000. in this calculation the company takes the assumption of 1 month with an effective working day that is 20 days. Food allowance received by employees every day is Rp. 20,000 and transportation money is Rp. 25,000. assuming technical employees always enter every month the amount of salary that the company gives each month is Rp 6,400,000.

In addition to the basic salary, food allowance and transportation money that employees receive each month, the company also provides benefits for the welfare of its employees. This is intended to provide comfort to employees and to implement existing government regulations.

Table 6. Employee Benefits

Annual	Total	Amount per year	
"Hari Raya" Annual	1 x Monthly salary	Rp	6,400,000
Healthy Annual	"BPJS" class 1 (Rp 400.000/ month)	Rp	4,800,000
"BPJS" employment	5,7% from monthly salary	Rp	4,377,600
	Total Annual Benefits	Rp	15,577,600

In table 6. the allowance provided by the company includes holiday allowance (THR) with a value of one month salary received by employees including food and transportation in 1 month (20 days) with a value of Rp 6,400,000, then medical benefits (BPJS) with first class health facilities with a value of Rp. 400,000 / person, the insured employee is not currently married, therefore the company only provides these employees with a total health benefit (BPJS) that the company pays annually at Rp. 4,800,000.

In addition to the BPJS the company also provides BPJS employment benefits with a value of 5.7% of salary. This percentage refers to government regulations regarding the amount of BPJS employment. With the amount of BPJS employment benefits the company pays annually at Rp 4,377,000. Every year the company provides or pays an allowance of Rp. 15,577,600. Employees in this case technically get salaries and benefits every year.

Table 7. Salary Costs and Allowances

Salary fee per year	**Rp**	**76,800,000**
Benefit Costs	Rp	15,577,600
Total annual salary	**Rp**	**92,377,600**

From table 7, it is concluded that employees get an annual salary of Rp. 92,377,600 this amount includes basic salaries and benefits provided by the company. In business, of course all business people want an increase or growth in their business. This increase or growth is also in line with economic growth in the place where the business is located. In this case the company adopted a policy with an increase of 5% every year.

Table 8. Salary Increase

Year	Salary per year	
0	Rp	92,377,600
1	Rp	96,996,480
2	Rp	101,846,304
3	Rp	106,938,619
4	Rp	112,285,550
5	Rp	117,899,828
6	Rp	123,794,819
7	Rp	129,984,560
8	Rp	136,483,788
9	Rp	143,307,977
10	Rp	150,473,376

Based on table 8, is the amount of salary and benefits provided each year starting from the first year to the 10th year, which is the age limit of investment determined by the company with an increase of 5% each year. The price of the calibrator is also one of the main costs in the procurement of this calibrator. For the price of the calibrator varies according to the calibration speed.

ISSN No:-2456-2165

Table 9. Price of Calibrator Equipment

	Grade A	Grade B	Grade C
Price of the tool	Rp 3,000,000,000	Rp 2,000,000,000	Rp 1,000,000,000

From table 9. explained for the price of the calibrator there are 3 types, namely grade A grade B and grade C. for each instrument has a different calibration speed, so that the use of both time and operatioanal will be different between types with one another. This will be a consideration for the company as well as choosing the type of calibrator in addition to being seen from the financial side.

In addition, the calibrator must also be calibrated in the country of origin. This calibration is intended so that the calibrator remains precise in its operation.

Table 10. Calibrator Costs

Year	Calibrator				Cost
	Old		New		
0	Rp 60,000,000	Rp	60,000,000	Rp	120,000,000
1	Rp 63,000,000	Rp	63,000,000	Rp	126,000,000
2	Rp 66,150,000	Rp	66,150,000	Rp	132,300,000
3	Rp 69,457,500	Rp	69,457,500	Rp	138,915,000
4	Rp 72,930,375	Rp	72,930,375	Rp	145,860,750
0	Rp 60,000,000	Rp	60,000,000	Rp	120,000,000
5	Rp 76,576,894	Rp	76,576,894	Rp	153,153,788
6	Rp 80,405,738	Rp	80,405,738	Rp	160,811,477
7	Rp 84,426,025	Rp	84,426,025	Rp	168,852,051
8	Rp 88,647,327	Rp	88,647,327	Rp	177,294,653
9	Rp 93,079,693	Rp	93,079,693	Rp	186,159,386
10	Rp 97,733,678	Rp	97,733,678	Rp	195,467,355

In table 10. explained in the procurement of this calibrator also calculated the cost of calibration of old and new calibrators. Because the users will both be used both old and new and used to improve the calibration service quality. At the cost of the calibration, both old and new calibrators are charged with the same cost, which is Rp. 60,000,000. on the calibration costs the company also set an increase in the cost for calibration of the calibrator annually by 5% each year.

In table 8. explained for the calibrator itself there are 3 types, namely type A grade B grade and C grade where each type is operationally the same only differing in calibration speed only.

Table 11. Calibration Speed

	Grade A	Grade B	Grade C
Calibration Speed	3 Hours	5 Hours	6 Hours

Previously, the company had a problem, namely the bridge in the calibration service because of the calibration tool calibration, which took up to 3 months. The company hopes that the addition of this new unit can cope when the old calibrator unit is being calibrated and vice versa when the new calibrator unit is being calibrated. The old unit can back it up, as shown in table 12. below.

Table 12. Calibration Time

Month	Unit	Time (HOUR)			
		Existing (8 hours)	Grade A (3 hours)	Grade B (5 hours)	Grade C (6 hours)
January	12	96	36	60	72
February	13	104	39	65	78
Mach	5	40	15	25	30
April	0	0	0	0	0
May	2	16	6	10	12
June	10	80	30	50	60
July	16	128	48	80	96
August	15	120	45	75	90
September	10	80	30	50	60
October	11	88	0	0	0
November	14	112	0	0	0
December	8	64	0	0	0
Total	116	928	249	415	498

In table 12. above it can be explained that the old unit has a long enough calibration time of 8 hours per 1 calibration tool. And old and new calibrators must be calibrated, which means that they cannot perform calibration services in March until May for old calibrators and October to December for new calibrators. Uncertain arrival due to external factors that are not controlled by our data can cause delays in unit integrity test calibration which will impact on customer production.

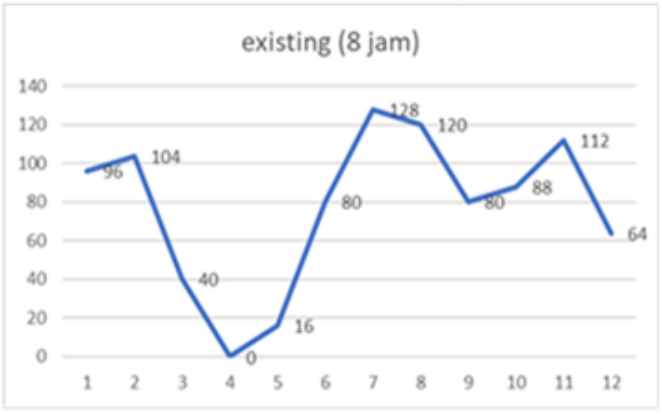

Figure 9. Existing Graph

Before the existence of a new calibrator the old calibrator could complete the calibration of 116 units of the integerty test with a total time of 928 hours in a period of 1 year. Where the brator times must be calibrated.

ISSN No:-2456-2165

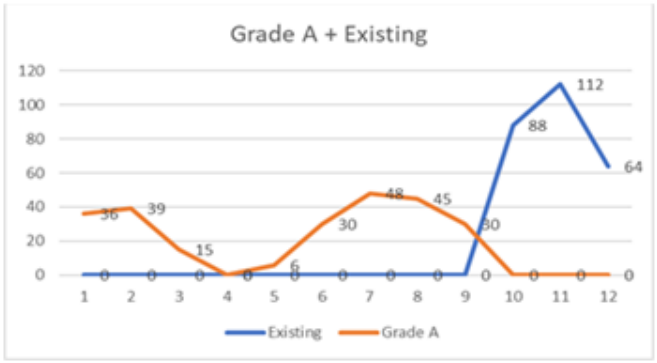

Figure 10. Grade A + Existing Graph

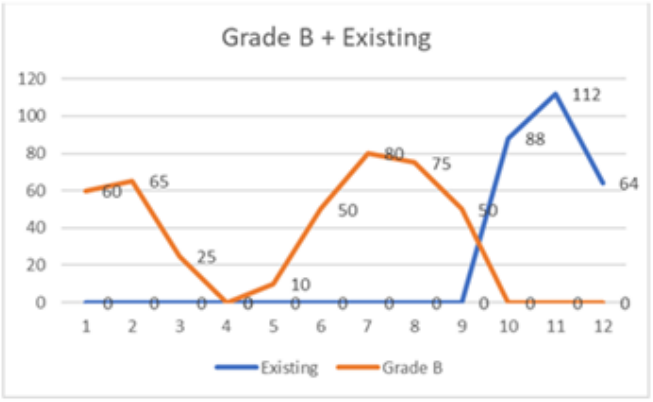

Figure 11. Grade B + Existing Graph

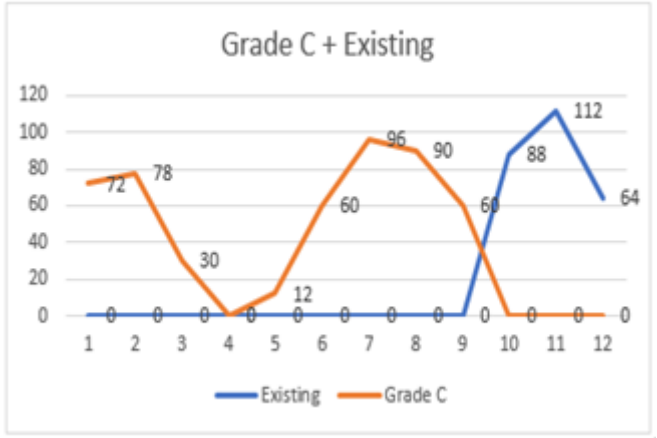

Figure 12. Grade C + Existing Graph

The addition of a new calibrator will certainly reduce work time and minimize delays. As explained in the picture above for the addition of grade A calibrators with a calibration time of 3 hours can complete the calibration with 249 hours with an off time of 3 months from October to December, as well as grade B with 415 hours and grade C with 498 hours.

Table 13. Calibrator Time

Calibrator	Total Waktu	
Existing	928	Hours
Existing calibrator + Grade A	513	Hours
Existing calibrator + Grade B	679	Hours
Existing calibrator + Grade C	762	Hours

In table 13. it is explained that the time taken in one year to calibrate with the addition of grade A, B and C. to add a grade A calibrator can reduce working time by 44%, grade B by 26% and garde c by 17%. Where this will affect the operational costs in the calibration sector at Pharmaceutical industrial equipment distributor company.

Table 14. Calibrator Operating Costs

	Watt
Electricity	350
AC 1	850
AC 2	850
Lamp	100
Others	60
Total	**2210 watt**

In the process of unit integrity test calibration services also use several facilities in the office, namely the lab. In the lab itself there are also used several equipment that uses electricity in its operation, such as the integerty test unit itself, air conditioners, lamps and other sources of electricity (Laptops, cellphones, etc.). All these components are multiplied by the number of hours needed for each calibrator in operation. In accordance with table 11. that each calibration grade has a different calibration speed level of course this will affect the costs incurred.

Table 15. Electricity Costs

Total watt	= 2210 watt
	= 2,210 kwh
1 kwh	= Rp 1.380,-

In table 15. above is explained for each component needed for the calibration process with a total wattage of 2210 or in other words of 2210 kwh. The electricity costs imposed by the government for the company are Rp 1,380 per one kwh. Table 4.12 below is the total cost needed for each grade of calibrator.

ISSN No:-2456-2165

Table 16. Total Costs

Year	Grade A	Grade B	Grade C
0	Rp 1,564,547	Rp 2,070,814	Rp 2,323,948
1	Rp 1,642,775	Rp 2,174,355	Rp 2,440,145
2	Rp 1,724,914	Rp 2,283,073	Rp 2,562,152
3	Rp 1,811,159	Rp 2,397,226	Rp 2,690,260
4	Rp 1,901,717	Rp 2,517,088	Rp 2,824,773
5	Rp 1,996,803	Rp 2,642,942	Rp 2,966,011
6	Rp 2,096,643	Rp 2,775,089	Rp 3,114,312
7	Rp 2,201,475	Rp 2,913,844	Rp 3,270,028
8	Rp 2,311,549	Rp 3,059,536	Rp 3,433,529
9	Rp 2,427,127	Rp 3,212,512	Rp 3,605,205
10	Rp 2,548,483	Rp 3,373,138	Rp 3,785,466

In table 16. above is explained for each cost required in one year of calibration service. Where the company is targeting an increase in the basic electricity tariff of 5% every year. It can be seen that each grade of the calibrator has different costs because the total operating time of the calibration service for each garde is different. With a grade A calibrator with a calibration speed of 3 hours and with the total time needed in the calibration service combined with the old calibrator having a year operating time of 513 hours with a total cost of electricity used in a year of Rp 1,564,547 for the first year. Of course the cost of electricity for grades B and C will be greater than grade A because the time required is longer, namely for grade B of 679 hours with a total electricity cost in a year of Rp 2,070,814 and for grade C of Rp 2,323,948 for the year first.

Each has operational costs that are almost the same as the salary of an employee where only 1 person manages the calibration unit and the calibration unit calibration units, both A, B and C, have the same costs. But for operational costs such as electricity and the price of the calibrator itself varies.

Table 17. Total Operating Costs

Year	Grade A	Grade B	Grade C
0	Rp 3,213,942,147	Rp 2,214,448,414	Rp 1,214,701,548
1	Rp 224,639,255	Rp 225,170,835	Rp 225,436,625
2	Rp 235,871,218	Rp 236,429,377	Rp 236,708,456
3	Rp 247,664,778	Rp 248,250,845	Rp 248,543,879
4	Rp 260,048,017	Rp 260,663,388	Rp 260,971,073
5	Rp 273,050,418	Rp 273,696,557	Rp 274,019,627
6	Rp 286,702,939	Rp 287,381,385	Rp 287,720,608
7	Rp 301,038,086	Rp 301,750,454	Rp 302,106,638
8	Rp 316,089,990	Rp 316,837,977	Rp 317,211,970
9	Rp 331,894,490	Rp 332,679,876	Rp 333,072,569
10	Rp 348,489,214	Rp 349,313,870	Rp 349,726,197

In table 17. above it is explained that the cost of procuring a calibrator is only charged in year 0 only for the rest of the year which counts only operational costs such as salaries, calibration costs, and electricity. It is explained in the table above that the operational costs from year 0 to year 10 for each grade of the calibrator do not differ much because this is only different for the calibration operational time which is correlated with the electricity costs needed.

B. Income

Obedience in the calibration sector is of course the cost of the calibration itself where the unit integrity test calibration costs Rp. 9,500.00 for one unit of integrity test. At present, Pharmaceutical industrial equipment distributor company has 116 units of integrity tests spread throughout Indonesia.

Table 18. Calibration Costs

Year	Total
1	Rp 1,102,000,000
2	Rp 1,157,100,000
3	Rp 1,214,955,000
4	Rp 1,275,702,750
5	Rp 1,339,487,888
6	Rp 1,406,462,282
7	Rp 1,476,785,396
8	Rp 1,550,624,666
9	Rp 1,628,155,899
10	Rp 1,709,563,694

For calibration costs the company is targeting a 5% increase with total revenue in the first year of Rp 1,102,000,000. this number does not include the addition of the unit integerty test over the next 10 years. The company focuses on obtaining existing Liberty units that are already in the customer, which is 116 units. Of course this amount has not been reduced by taxes and operational costs each year.

C. Grade A

Grade A Calibrator with a price of Rp. 3,000,000,000 with a calibration speed of 3 hours / unit integrity test. In this study the authors made a cost analysis for Grade A Calibrator kaibrator. Based on Law No.36 of 2008 concerning Taxable Income for companies as follows:

Table 19. Taxable income

No.	Taxable income	Tax Rate (%)
1.	s/d Rp. 50 million	5%
2.	Rp. 50 s/d 250 million	15%
3.	Rp. 250 million s/d 500 million	25%
4.	Rp 500 million	30%

ISSN No:-2456-2165

In table 19 above it is explained that taxable income is levied progressively starting from 50 million to 500 million and above. Where PT XYZ has revenues of more than 500 million for the calibration sector. The table below is a tax that is levied for each year. Where taxes are calculated progressively.

Year	Selling	Expenditure	Profit before tax	"PPh"				Profit after tax
				5%	15%	25%	30%	
1	Rp 1,102,000,000	Rp 241,077,141	Rp 860,922,859	Rp 43,046,142.95	Rp 129,138,428.85	Rp 215,230,714.75	Rp 258,276,857.70	Rp 215,230,715
2	Rp 1,157,100,000	Rp 253,130,998	Rp 903,969,002	Rp 45,198,450.10	Rp 135,595,350.30	Rp 225,992,250.50	Rp 271,190,700.60	Rp 225,992,251
3	Rp 1,214,955,000	Rp 265,787,548	Rp 949,167,452	Rp 47,458,372.60	Rp 142,375,117.80	Rp 237,291,863.00	Rp 284,750,235.60	Rp 237,291,863
4	Rp 1,275,702,750	Rp 279,076,925	Rp 996,625,825	Rp 49,831,291.25	Rp 149,493,873.75	Rp 249,156,456.25	Rp 298,987,747.50	Rp 249,156,456
5	Rp 1,339,487,888	Rp 293,030,771	Rp 1,046,457,117	Rp 52,322,855.85	Rp 156,968,567.55	Rp 261,614,279.25	Rp 313,937,135.10	Rp 261,614,279
6	Rp 1,406,462,282	Rp 307,682,310	Rp 1,098,779,972	Rp 54,938,998.60	Rp 164,816,995.80	Rp 274,694,993.00	Rp 329,633,991.60	Rp 274,694,993
7	Rp 1,476,785,936	Rp 322,066,426	Rp 1,153,719,510	Rp 57,685,975.50	Rp 173,057,926.50	Rp 288,429,877.50	Rp 346,115,853.00	Rp 288,429,878
8	Rp 1,550,624,666	Rp 339,219,747	Rp 1,211,404,919	Rp 60,570,245.95	Rp 181,710,737.85	Rp 302,851,229.75	Rp 363,421,475.70	Rp 302,851,230
9	Rp 1,628,155,899	Rp 356,180,734	Rp 1,271,975,165	Rp 63,598,758.25	Rp 190,796,274.75	Rp 317,993,791.25	Rp 381,592,549.50	Rp 317,993,791
10	Rp 1,709,563,694	Rp 373,989,771	Rp 1,335,573,923	Rp 66,778,696.15	Rp 200,336,088.45	Rp 333,893,480.75	Rp 400,672,176.90	Rp 333,893,481

Table 20. Calculation of Income Tax Grade A

In table 20. above it is explained that the income generated annually is not net income but income that has not been taxed. Where the tax calculation is progressively ranging from 50 million to more than 250 million. Can be seen in table 4.15 for net income received in the first year of Rp. 567,415,287, - this value is the net profit every year. Where income is subtracted by expenses and income tax is deducted.

Table 21. Profit After Tax

Year	Profit After Tax (Rp)
	Increase 5%
1	567,415,287
2	586,786,051
3	607,125,353
4	628,481,621
5	650,905,702
6	674,450,987
7	699,173,537
8	725,132,214
9	752,388,824
10	781,008,265

Based on table 21 it is explained that profit after tax from year to year has increased this is in accordance with the increase in revenue targeted by the company that is equal to 5%

D. MPP

In this case the company determines the return on capital does not exceed 5 years of operation. The benefits are by reducing capital with the profits that are made each year.

Table 22. "MPP" Grade A

Year	NCF nominal (Rp)	Accumulation (Rp)
0	-3,229,597,277	-3,229,597,277
1	567,415,287	-2,662,181,990
2	586,786,051	-2,075,395,939
3	607,125,353	-1,468,270,586
4	628,481,621	-839,788,965
5	650,905,702	-188,883,263
6	674,450,987	485,567,725
7	699,173,537	1,184,741,262
8	725,132,214	1,909,873,475
9	752,388,824	2,662,262,299
10	781,008,265	3,443,270,565
Total		

Based on table 22.it is explained that MPP Grade A is between the 5th and 6th years. The exact value is sought by using interpolation between the 5th and 6th years where the value changes from Rp - 188,883,263 to Rp + 485,567,725 in year 6. The MPP value is sought when the accumulated value is equal to 0. So that the MPP value or the year of return on capital is obtained 5 years 3 months. This achievement is certainly one of the factors considered by the company to invest in this tool. Because the value obtained exceeds the maximum time set by the company which is 5 years.

E. NPV (*Net Present Value*)

Net Present Value uses the initial purchase price and time value of money to calculate the value of an asset. Thus, it can be said that the NPV is the present value of the assets reduced by the initial purchase price.

Year	(Rp)	Interest 20 % 1/(1+I)^n	NCFPV
0	-3,229,597,277	1.000	-3,229,597,277
1	567,415,287	0.833	472,846,072
2	586,786,051	0.694	407,490,313
3	607,125,353	0.579	351,345,691
4	628,481,621	0.482	303,087,202
5	650,905,702	0.402	261,584,403
6	674,450,987	0.335	225,872,271
7	699,173,537	0.279	195,126,502
8	725,132,214	0.233	168,642,577
9	752,388,824	0.194	145,817,995
10	781,008,265	0.162	126,137,195
Total			-571,647,056

Table 23. "NPV" Grade A

ISSN No:-2456-2165

Based on table 22. it is discussed that net cash flow present value from year to year is calculated based on a decrease in this factor with a value set at the company of 20%. This value shows that investment made for grade A calibrators with an interest rate of 20% is not feasible because the final value of the NPV at the end of the 10-year investment period is negative.

F. IRR (*Internal Rate of Return)*

IRR (*Internal Rate of Return)* is used to calculate the actual rate of return. Basically the Internal Rate of Return (IRR) must be sought by trial and error.

Table 24. IRR Grade A Interest of 30%

Year	Net Cash Flow (Rp)	Interest 30% 1/(1+I)^n	Present Value
0	-3,229,597,277	1.000	-3,229,597,277
1	567,415,287	0.769	436,473,297
2	586,786,051	0.592	347,210,681
3	607,125,353	0.455	276,342,901
4	628,481,621	0.350	220,048,885
5	650,905,702	0.269	175,307,830
6	674,450,987	0.207	139,730,200
7	699,173,537	0.159	111,424,711
8	725,132,214	0.123	88,893,577
9	752,388,824	0.094	70,949,962
10	781,008,265	0.073	56,652,895
	Total		**-1,306,562,338**

Table 25. IRR Grade A Interest of 20%

Year	Net Cash Flow (Rp)	Interest 20% 1/(1+I)^n	Present Value
0	-3,229,597,277	1.000	-3,229,597,277
1	567,415,287	0.833	472,846,072
2	586,786,051	0.694	407,490,313
3	607,125,353	0.579	351,345,691
4	628,481,621	0.482	303,087,202
5	650,905,702	0.402	261,584,403
6	674,450,987	0.335	225,872,271
7	699,173,537	0.279	195,126,502
8	725,132,214	0.233	168,642,577
9	752,388,824	0.194	145,817,995
10	781,008,265	0.162	126,137,195
Total			**-571,647,056**

Table 26. IRR Grade A Interest of 10%

Year	Net Cash Flow (Rp)	Interest 10% 1/(1+I)^n	Present Value
0	-3,229,597,277	1.000	-3,229,597,277
1	567,415,287	0.909	515,832,079
2	586,786,051	0.826	484,947,150
3	607,125,353	0.751	456,142,264
4	628,481,621	0.683	429,261,404
5	650,905,702	0.621	404,161,230
6	674,450,987	0.564	380,709,999
7	699,173,537	0.513	358,786,576
8	725,132,214	0.467	338,279,529
9	752,388,824	0.424	319,086,308
10	781,008,265	0.386	301,112,496
	Total		**758,721,758**

Based on the table 24-26.above it is explained that IRR Grade A is negative when the interest rate is 20% with a final value of (-571,647,056). This indicates that the interest rate taken is not effective or not good. Likewise with an interest rate of 30%, the final value is greater than the 20% interest rate, which is valued at -1,306,562,338. This shows that the interest rate taken in the trial error in the IRR method is getting greater when the interest rate continues to rise in conducting trial and error. When interest rates are taken below 10%, a positive final value of 758,721,758 is found. This shows that the maximum internal rate of return is between the interest rates of 10% to 20%. This rate of return value is one of the parameters of an investor to invest in a company. If the IRR value is greater than the current bank interest rate, this means that the investment is very feasible, but if the IRR is below the existing bank interest rate, it needs to be reconsidered. In Grade A, the IRR value is found by interpolation between 10% to 20%, and the IRR value is 15.7%..

G. Grade B

Grade B Kalibrator with the price of Rp. 2,000,000,000 with 5 hour calibration speed / unit integrity test. In this study the authors made a cost analysis for Grade A Calibrator kaibrator. Based on Law No.36 of 2008 concerning Taxable Income for companies as follows:

Table 27. Taxable income

No.	Taxable income	Tax Rate (%)
1.	s/d Rp. 50 million	5%
2.	Rp. 50 s/d 250 million	15%
3.	Rp. 250 million s/d 500 million	25%
4.	Rp 500 million	30%

Year	Selling	Expenditure	Profit before tax	"PPh"				Profit after tax
				5%	15%	25%	30%	
1	Rp 1,102,000,000	Rp 241,077,141	Rp 860,922,859	Rp 43,046,142.95	Rp 129,138,428.85	Rp 215,230,714.75	Rp 258,276,857.70	Rp 215,230,715
2	Rp 1,157,100,000	Rp 253,130,998	Rp 903,969,002	Rp 45,198,450.10	Rp 135,595,350.30	Rp 225,992,250.50	Rp 271,190,700.60	Rp 225,992,251
3	Rp 1,214,955,000	Rp 265,787,548	Rp 949,167,452	Rp 47,458,372.60	Rp 142,375,117.80	Rp 237,291,863.00	Rp 284,750,235.60	Rp 237,291,863
4	Rp 1,275,702,750	Rp 279,076,925	Rp 996,625,825	Rp 49,831,291.25	Rp 149,493,873.75	Rp 249,156,456.25	Rp 298,987,747.50	Rp 249,156,456
5	Rp 1,339,487,888	Rp 293,030,771	Rp 1,046,457,117	Rp 52,322,855.85	Rp 156,968,567.55	Rp 261,614,279.25	Rp 313,937,135.10	Rp 261,614,279
6	Rp 1,406,462,282	Rp 307,682,310	Rp 1,098,779,972	Rp 54,938,998.60	Rp 164,816,995.80	Rp 274,694,993.00	Rp 329,633,991.60	Rp 274,694,993
7	Rp 1,476,785,936	Rp 323,066,426	Rp 1,153,719,510	Rp 57,685,975.50	Rp 173,057,926.50	Rp 288,429,877.50	Rp 346,115,853.00	Rp 288,429,878
8	Rp 1,550,624,666	Rp 339,219,747	Rp 1,211,404,919	Rp 60,570,245.95	Rp 181,710,737.85	Rp 302,851,229.75	Rp 363,421,475.70	Rp 302,851,230
9	Rp 1,628,155,899	Rp 356,180,734	Rp 1,271,975,165	Rp 63,598,758.25	Rp 190,796,274.75	Rp 317,993,791.25	Rp 381,592,549.50	Rp 317,993,791
10	Rp 1,709,563,694	Rp 373,989,771	Rp 1,335,573,923	Rp 66,778,696.15	Rp 200,336,088.45	Rp 333,893,480.75	Rp 400,672,176.90	Rp 333,893,481

Table 28. Grade B

Based on table 27.above explains that taxable income is levied progressively starting from 50 million to 500 million and above. Where PT XYZ has revenues of more than 500 million for the calibration sector. The table below is a tax that is levied for each year. Where taxes are calculated progressively.

ISSN No:-2456-2165

In table 28. above it is explained that the income generated annually is not net income but income that has not been taxed. Where the tax calculation is progressively ranging from 50 million to more than 250 million. Can be seen in the table for net income received in the first year of Rp 667,646,001, - this value is the net profit every year. Where income is subtracted by expenses and income tax is deducted.

H. Profit After Tax

Table 29. Profit After Tax

Year	Profit After Tax (Rp)
1	677,646,001
2	707,778,301
3	739,417,217
4	772,638,077
5	807,519,981
6	844,145,980
7	882,603,279
8	922,983,443
9	965,382,615
10	1,009,901,746

Based on table 29. above explained that profit after tax from year to year has increased this is in accordance with the increase in revenue targeted by the company that is equal to 5%.

I. MPP

MPP calculation with table 30. below is a way to calculate the minimum period of return on capital investment by a company to return capital for an investment. In this case the company determines the return on capital does not exceed 5 years of operation. Calculations by reducing capital with the profits obtained each year.

Table 30. MPP Grade B

Year	(Rp)	Interest 20 % 1/(1+I)^n	NCFPV
0	-2,230,066,891	1.000	-2,230,066,891
1	677,646,001	0.833	564,705,001
2	707,778,301	0.694	491,512,709
3	739,417,217	0.579	427,903,482
4	772,638,077	0.482	372,607,098
5	807,519,981	0.402	324,524,169
6	844,145,980	0.335	282,702,781
7	882,603,279	0.279	246,318,377
8	922,983,443	0.233	214,656,450
9	965,382,615	0.194	187,097,618
10	1,009,901,746	0.162	163,104,770
Total			1,045,065,564

Based on table 30 above, it is explained that MPP Grade B is between the 3rd and 4th years. The exact value is sought by using interpolation between the 3rd and 4th year, where there is a change in value, from IDR -105,225,372 to IDR + 667,412,706 in the year. 4. The MPP value is sought when the accumulated value is equal to 0. So that the MPP value or the year of return of capital is obtained in 3 years and 1 month. This achievement is certainly one of the factors considered by the company to invest in this tool. Because the value that can be less than the maximum time set by the company is 5 years.

J. NPV

Net Pressent Value uses the initial purchase price and time value of money to calculate the value of an asset. Thus, it can be said that the NPV is the present value of the assets reduced by the initial purchase price.

Table 31. NPV Grade B

Based on table 31.above, it is explained that the net cas flow present value from year to year, the value decreases due to the discount factor value that has been set by the company, which is 20%. This shows that the investment made for grade B calibrators with an interest rate of 20% t is feasible because the final value of the NPV at the end of the 10 year investment period is positive.

K. IRR

The Internal Rate of Return (IRR)method is used to calculate the actual rate of return. Basically the Internal Rate of Return (IRR) must be sought by trial and error.

ISSN No:-2456-2165

Year	NCF nominal (Rp)	Accumulation (Rp)
0	-2,230,066,891	-2,230,066,891
1	677,646,001	-1,552,420,890
2	707,778,301	-844,642,588
3	739,417,217	-105,225,372
4	772,638,077	667,412,706
5	807,519,981	1,474,932,687
6	844,145,980	2,319,078,667
7	882,603,279	3,201,681,947
8	922,983,443	4,124,665,390
9	965,382,615	5,090,048,005
10	1,009,901,746	6,099,949,752

Table 32. IRR Grade B 20% Interest

Based on table 31 above, it is explained that IR Grade B from year 0 has a present value of -2,230,066,891 until the 10th year has a present value of 389,360,841. But the total present value from year 0 to year 10 gets a value of 2,714,348,685. Therefore the present value from year to year has increased.

Calculation of IRR value with an interest rate of 10% (the company is determined to follow the bank interest rate). The table below is how to calculate the IRR value as follows:

Table 33. IRR Grade B Interest 30%

Year	Net Cash Flow (Rp)	Interest 30% 1/(1+I)^n	Present Value
0	-2,230,066,891	1.000	-2,230,066,891
1	677,646,001	0.769	521,266,155
2	707,778,301	0.592	418,803,729
3	739,417,217	0.455	336,557,677
4	772,638,077	0.350	270,522,068
5	807,519,981	0.269	217,488,609
6	844,145,980	0.207	174,886,966
7	882,603,279	0.159	140,657,233
8	922,983,443	0.123	113,148,055
9	965,382,615	0.094	91,035,190
10	1,009,901,746	0.073	73,256,405
Total			127,555,195

Year	Net Cash Flow (Rp)	Interest 40% 1/(1+I)^n	Present Value
0	-2,230,066,891	1.000	-2,230,066,891
1	677,646,001	0.714	484,032,858
2	707,778,301	0.510	361,111,378
3	739,417,217	0.364	269,466,916
4	772,638,077	0.260	201,124,031
5	807,519,981	0.186	150,145,769
6	844,145,980	0.133	112,111,288
7	882,603,279	0.095	83,727,724
8	922,983,443	0.068	62,541,692
9	965,382,615	0.048	46,724,768
10	1,009,901,746	0.035	34,913,932
Total			-424,166,534

Year	Net Cash Flow (Rp)	Interest 20 % 1/(1+I)^n	NPV
0	-2,230,066,891	1.000	-2,230,066,891
1	677,646,001	0.833	564,705,001
2	707,778,301	0.694	491,512,709
3	739,417,217	0.579	427,903,482
4	772,638,077	0.482	372,607,098
5	807,519,981	0.402	324,524,169
6	844,145,980	0.335	282,702,781
7	882,603,279	0.279	246,318,377
8	922,983,443	0.233	214,656,450
9	965,382,615	0.194	187,097,618
10	1,009,901,746	0.162	163,104,770
Total			1,045,065,564

Table 34. IRR Grade B Interest 40%

Based on table 33-34. above explained that IRR Grade B is negative when the interest rate is 40% with a final value of -424,166,534. This indicates that the interest rate taken is not effective or not good. However, at an interest rate of 30%, the final value is greater than the interest rate of 40%, which is valued at + 127,555,195. This shows that the interest rate taken in the trial error in the IRR method on Garade B is negative when the interest rate is raised more than 30%, this is evidenced when the interest rate at 20% is found to have a final value greater than the 30% interest rate. of + 1,045,065,564. This shows that the maximum internal rate of return is between the interest rates of 30% to 40%. This rate of return value is one of the parameters of an investor to invest in a company. If the IRR value is greater than the current bank interest rate, this means that the investment is very feasible, but if the IRR is below the existing bank interest rate, it needs to be reconsidered. In Grade B, the IRR value is found by interpolation between 30% to 40%, and the IRR value is 32.4%.

L. Grade C

Grade C Calibrator with a price of Rp. 1,000,000,000 with calibration speed for 3 hours / unit integrity test. In this study the authors made a cost analysis for Grade A Calibrator kaibrator. Based on Law No.36 of 2008 concerning Taxable Income for companies as follows:

No.	Taxable income	Tax Rate (%)
1.	s/d Rp. 50 million	5%
2.	Rp. 50 s/d 250 million	15%
3.	Rp. 250 million s/d 500 million	25%
4.	Rp 500 million	30%

Table 35. Taxable income

ISSN No:-2456-2165

In table 35. above it is explained that taxable income is levied progressively starting from 50 million to 500 million and above. Where PT XYZ has revenues of more than 500 million for the calibration sector. The table below is a tax that is levied for each year. Where taxes are calculated progressively.

Table 36. Grade C

Year	Selling	Expenditure	Profit before tax	"PPh"				Profit after tax
				5%	15%	25%	30%	
1	Rp 1,102,000,000	Rp 241,077,141	Rp 860,922,859	Rp 43,046,142.95	Rp 129,138,428.85	Rp 215,230,714.75	Rp 258,276,857.70	Rp 215,230,715
2	Rp 1,157,100,000	Rp 253,130,998	Rp 903,969,002	Rp 45,198,450.10	Rp 135,595,350.30	Rp 225,992,250.50	Rp 271,190,700.60	Rp 225,992,251
3	Rp 1,214,955,000	Rp 265,787,548	Rp 949,167,452	Rp 47,458,372.60	Rp 142,375,117.80	Rp 237,291,863.00	Rp 284,750,235.60	Rp 237,291,863
4	Rp 1,275,702,750	Rp 279,076,925	Rp 996,625,825	Rp 49,831,291.25	Rp 149,493,873.75	Rp 249,156,456.25	Rp 298,987,747.50	Rp 249,156,456
5	Rp 1,339,487,888	Rp 293,030,771	Rp 1,046,457,117	Rp 52,322,855.85	Rp 156,968,567.55	Rp 261,614,279.25	Rp 313,937,135.10	Rp 261,614,279
6	Rp 1,406,462,282	Rp 307,682,310	Rp 1,098,779,972	Rp 54,938,998.60	Rp 164,816,995.80	Rp 274,694,993.00	Rp 329,633,991.60	Rp 274,694,993
7	Rp 1,476,785,936	Rp 323,066,426	Rp 1,153,719,510	Rp 57,685,975.50	Rp 173,057,926.50	Rp 288,429,877.50	Rp 346,115,853.00	Rp 288,429,878
8	Rp 1,550,624,666	Rp 339,219,747	Rp 1,211,404,919	Rp 60,570,245.95	Rp 181,710,737.85	Rp 302,851,229.75	Rp 363,421,475.70	Rp 302,851,230
9	Rp 1,628,155,899	Rp 356,180,734	Rp 1,271,975,165	Rp 63,598,758.25	Rp 190,796,274.75	Rp 317,993,791.25	Rp 381,592,549.50	Rp 317,993,791
10	Rp 1,709,563,694	Rp 373,989,771	Rp 1,335,573,923	Rp 66,778,696.15	Rp 200,336,088.45	Rp 333,893,480.75	Rp 400,672,176.90	Rp 333,893,481

In table 36. above it is explained that the income generated annually is not net income but income that has not been taxed. Where the tax calculation is progressively ranging from 50 million to more than 250 million. Can be seen in the table for net income received in the first year of Rp 677,646,001, - this value is the net profit every year. Where income is subtracted by expenses and income tax is deducted.

M. Profit after tax

Tabel 37. Profit after tax

Year	Profit after tax (Rp)
1	677,646,001
2	707,778,301
3	739,417,217
4	772,638,077
5	807,519,981
6	844,145,980
7	882,603,279
8	922,983,443
9	965,382,615
10	1,009,901,746

Based on table 37. above explained that profit after tax from year to year has increased this is consistent with the increase in revenue targeted by the company that is equal to 5%.

N. MPP Grade C

The MPP calculation with the table below is a way to calculate the minimum time period of return on capital investment by a company to return capital for an investment. In this case the company determines the return on capital does not exceed 10 years of operation. Calculations by reducing capital with the profits obtained each year.

Table 38. MPP Grade C

Year	NCF nominal (Rp)	Accumulation (Rp)
0	-1,230,301,698	-1,230,301,698
1	677,646,001	-552,655,697
2	707,778,301	155,122,605
3	739,417,217	894,539,821
4	772,638,077	1,667,177,899
5	807,519,981	2,474,697,880
6	844,145,980	3,318,843,860
7	882,603,279	4,201,447,140
8	922,983,443	5,124,430,583
9	965,382,615	6,089,813,198
10	1,009,901,746	7,099,714,945

Based on table 38.above, it is explained that MPP Grade C is between the 1st and 2nd years. The exact value is sought by using interpolation between the 1st and 2nd year where the value changes from IDR -552,655,697 to IDR + 155,122,605 in the year. 2. The value of MPP is sought when the accumulated value is equal to 0. So that the value of MPP or year of return on capital can be obtained in 1 year and 9 months. This achievement is certainly one of the factors considered by the company to invest in this tool. Because the value that can be less than the maximum time set by the company is 10 years.

O. NPV Grade C

This NPV or Net Present Value estimates the present value of a project, asset or investment based on expected cash inflows in the future and cash outflows adjusted to the interest rate and initial purchase price. Net Pressent Value uses the initial purchase price and time value of money to calculate the value of an asset. Thus, it can be said that the NPV is the present value of the assets reduced by the initial purchase price.

Tabel 39. NPV Grade C

Year	(Rp)	Interest 20% 1/(1+I)^n	Present Value
0	-1,230,301,698	1.000	-1,230,301,698
1	677,646,001	0.833	564,705,001
2	707,778,301	0.694	491,512,709
3	739,417,217	0.579	427,903,482
4	772,638,077	0.482	372,607,098
5	807,519,981	0.402	324,524,169
6	844,145,980	0.335	282,702,781
7	882,603,279	0.279	246,318,377
8	922,983,443	0.233	214,656,450
9	965,382,615	0.194	187,097,618
10	1,009,901,746	0.162	163,104,770
	Total		2,044,830,757

Based on table 38.above, it is explained that the net cas flow present value from year to year, the value decreases due to the discount factor value that has been set by the company,

ISSN No:-2456-2165

which is 20%. This shows that the investment made for grade C calibrators with an interest rate of 20% is feasible because the final value of the NPV at the end of the 10 year investment period is positive.

P. IRR Grade C

This Internal Rate of Return (IRR) method is used to calculate the actual rate of return. Basically the Internal Rate of Return (IRR) must be sought by trial and error.

Table 40. IRR Grade C Interest 40%

Year	Net Cash Flow (Rp)	Interest 60 % 1/(1+I)^n	NCFPV
0	-1,230,301,698	1.000	-1,230,301,698
1	677,646,001	0.625	423,528,751
2	707,778,301	0.391	276,475,899
3	739,417,217	0.244	180,521,781
4	772,638,077	0.153	117,895,214
5	807,519,981	0.095	77,011,107
6	844,145,980	0.060	50,315,021
7	882,603,279	0.037	32,879,534
8	922,983,443	0.023	21,489,883
9	965,382,615	0.015	14,048,166
10	1,009,901,746	0.009	9,185,003
	Total		-26,951,338

Table 41. IRR Grade C Interest 50%

Year	Net Cash Flow (Rp)	Interest 50 % 1/(1+I)^n	NCFPV
0	-1,230,301,698	1.000	-1,230,301,698
1	677,646,001	0.667	451,764,001
2	707,778,301	0.444	314,568,134
3	739,417,217	0.296	219,086,583
4	772,638,077	0.198	152,619,867
5	807,519,981	0.132	106,340,080
6	844,145,980	0.088	74,108,838
7	882,603,279	0.059	51,656,708
8	922,983,443	0.039	36,013,376
9	965,382,615	0.026	25,111,817
10	1,009,901,746	0.017	17,513,241
	Total		218,480,947

Table 42. IRR Grade C Interest 60%

Based on table 40-42. above explained that IR Grade C is negative when interest rates are 60% with a final value of -26,951,338. This indicates that the interest rate taken is not effective or not good. However, differing in calculations using the 50% interest rate, the final value is greater than the 50% interest rate, which is valued at + 218,480,947. This shows that the interest rate taken in the trial error in the IRR method is getting greater when the interest rate continues to rise in conducting trial and error. When the interest rate is taken at 40% a positive final value of + 575,598,659 is found. This shows that the maximum internal rate of return is between the interest rates of 50% to 60%. This rate of return value is one of the parameters of an investor to invest in a company. If the IRR value is greater than the current bank interest rate, this means that the investment is very feasible, but if the IRR is below the existing bank interest rate, it needs to be reconsidered. In Grade C, the IRR value was found by interpolation between 50% to 60%, and the IRR value was 58.9%.

G. Decision Making

By looking at the return of an investor can determine whether the investment is feasible. The return itself can be seen by using the PP (Payback Period) motive in capital budgeting. In chapter IV the results of the study are obtained 2 return values with a return below the expected value of under 5 years for Grade B and Grade C, but by looking at the current conditions it is possible to take K boxes with grade C by looking at capital withdrawals only with less than 2 years.

In Indonesia alone, the use of an integrated test tool in the pharmaceutical industry is a major determinant of whether or not the quality of the product is in line with the regulations of the BPPOM which require the use of an integrity test device before and after the sterile process. Therefore, the purchase of K box will be an option to see the condition of the company that continues to experience the calibration process due to delays in the arrival of the K Box.

Risks that cannot be overcome by these companies are usually because they cannot be controlled by the company. There are three risks in the company that can be distinguished:

1) Individual risk

Individual risk is the risk that comes from an individual investment project without being influenced by other projects. In this case the individual risk in the company is about rising costs which will cause changes in the value of the feasibility study on the capital budgeting method above. In this case, the company takes an increase in the annual process of 5% both for salary increases, operational costs (electricity) and the calibration costs themselves which are a source of income in the calibration sector of the Pharmaceutical industrial equipment distributor company.

2) Company risk

Company risk is risk that can be measured without considering the diversity faced / portfolio carried out by investors. In this investment the company does not use or look for investors but instead uses the company's own funds. So in the risk of companies in this study set aside the risks faced by investors.

3) Market risk

Market risk is the risk of investment in terms of investors who invest their capital in investments that are also carried out by companies and other companies. In this study the company did not use investror. But in its market the K Box is used to calibrate the integrity test tool used in the entire pharmaceutical industry. This is because in the process

the pharmaceutical industry must use an integrity test tool which must be calibrated every year. As per picture 3.

V. CONCLUSIONS

Based on the results of the discussion in the previous chapter, it can be concluded as follows:

1. Analysis of the decision to invest in a calibrator at Pharmaceutical industrial equipment distributor companysees that a risk assessment is feasible.
2. Purchasing a new calibrator at Pharmaceutical industrial equipment distributor companyis feasible.

Based on the conclusions above, the author tries to convey some suggestions for further research.

1. For the selection of a new calibrator looking at the cost analysis and operating time aspects, it is recommended to choose a C grade calibrator, this is because the addition of the calibrator was initially intended to anticipate delays in unit integrity test calibration when the old calibrator is being calibrated.
2. To add technical personnel in the calibration section to anticipate when the main personnel are unable to enter. This is aimed at keeping the calibration schedule running as it should be no delay.

REFERENCES

[1]. Prihastono, Endro (2015). Analisis kelayakan investasi mesin untuk meningkatkan kapasitas produksi. Semarang : universitas semarang

[2]. Purnatiyo, Dwinanto. (2012). *Analisis Kelayakan investasi AlatDNA Real Time Thermal Cycler (RT-PCR) untuk Pengujian Gelatin, Tangerang : Univeristas muhamadiyah*

[3]. *Rahayu, sri. (2014). Analisis kelayakan investasi atas rencana penambahan aktiva tetap dengan menggunakan teknik capitas budgeting. Malang : universitas brawijaya*

[4]. Riyanto, Bambang, Prof.Dr, 2001. *Dasar-DasarPembelanjaan Perusahaan*. Edisi 4 Yogyakarta :BPYE

[5]. Saifi, Muhammad. (2017). *Analisis Kleayakan Investasi Atas Rencana penambahan Aktiva Tetap*. Universitas brawijaya. Malang

[6]. Setyawan, Bangkit, (2014). *Studi Kelayakan Investasi proyek Automasi Pabrik Kelapa Sawit PT XYZ*, Sumatra Utara

[7]. Sjahrial, Dermawan. 2007. *Manajemen Keuangan*. Edisi Pertama. MitraWacana Media. Jakarta.

[8]. Supeni, neli (2015). Analisis kelyakan investasi mesin pencetak kemasan pada UD robin Jaya Sentosa situbondo. Jawa timur : universitas jember.

[9]. Sutojo, Suwanto, 2002. *Studi Kelayakan ProyekKonsep, Teknik, dan Kasus.* Jakarta : PT.Damar Mulia Pustaka.