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Feasibility Analysis of Investing in Additional Vehicles at An Egg Distributor

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Abstract

Business or investment feasibility analysis is research into a business plan that will analyze whether the investment to be made is feasible or not. Amalia Bintang Telur is located in the Cibitung area, Bekasi, West Java and has a branch located in Kalibata, South Jakarta which is the object of this research. This distributor has vehicles in the form of Grandmax type pick-up cars. The car's carrying capacity is 1800 kg. The problem faced by this distributor is that there are frequent delays due to a lack of vehicles for distribution, while there is high demand to be met. Usually, in dealing with these delays, distributors negotiate first with customers. If not addressed, the level of customer satisfaction with this distributor will decrease. There are several methods used to analyze the feasibility of an investment, namely, NPV, PP, Interest Rate (IRR) and Sum off Years Depreciation. It is concluded that the investment in adding a pick up car is worth doing, seen from the resulting positive NPV value of Rp. 942,260,893.38, based on the payback method this investment period is worth doing because the return occurs in the 1st year which produces a cumulative value of positive, the IRR investment method is worth investing in because the IRR value obtained is greater than the MARR used, namely 399% > 15%. For depreciation value, car prices tend to decrease every year. In the first year, the book value decreases by 19.44%, but after that, the depreciation in value will slow down with the depreciation percentage continuing to decrease by 2.34% until the eighth year.

Keywords: Investment Feasibility, NPV, Payback Period, IRR

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INTRODUCTION

A logistics activity has a process that cannot be separated, namely the distribution process. Distribution has a very important role because it acts as a liaison between sellers and buyers. Distribution aims to deliver products in the form of goods or services from the point of supply to the point of demand.

The distribution process requires transportation to make it easier to get a product anytime and anywhere (Trimintasih, et al, 2016). And the distribution process must require transportation as facilities and infrastructure to meet demand needs in order to obtain customer satisfaction with the services provided. When opening a business and needing transportation as the main factor so that the

business can run smoothly, an initial investment is needed to buy a vehicle. Investment is a link between resources in the long term to generate profits in the future. Investment can also be said to be expenditure to purchase capital goods now with the aim of producing goods or services to obtain greater profits in the future (Mulyadi, 2014). The main objective of investment is to obtain positive benefits in the future in the form of company profits in financial and non-financial forms. More precisely, the purpose of investing is to increase current income levels so that life in the future will be better, prevent the decline in the value of wealth due to inflation, and benefit from government tax advantages offered to investors in certain industries (Lubis, 2016).

However, before making an investment, an investment feasibility study is needed to avoid investments that are not profitable for a business. The investment policy will be guided by calculating the investment value using the value of future cash flows. The results of this comparison will be used as information to determine whether the investment strategy can be said to be economical or not (Hidayat, 2019).

A business or investment feasibility study is research into a business plan that will analyze whether the investment to be made is feasible or not and also when it is operated regularly to achieve profits maximum for an unspecified time (Mairawati et al, 2016). In assessing the feasibility of an investment, it is carried out while the business or project is running. Assessing the feasibility of investment while a project is being implemented is called a project feasibility study, if carried out in the business development process it is called a business feasibility study (Trimintasih, et al, 2016). Finding solutions to reduce risks and obstacles that may occur in the future is one of the objectives of conducting a business feasibility study. This is done because the future is full of uncertainty (Adyana, 2020).

There are three reasons why a feasibility study is needed in considering decision making in making an investment, which consists of: capital expenditure that is not small to make an investment, the long-term consequences that must be faced when capital expenditure is made, and when the decision has been chosen then difficult to change when there is already a commitment at the time of capital expenditure (Zakarian et al, 2017). Mistakes in analyzing investments will cause losses and also big risks for a business. With this investment feasibility analysis, a company can avoid committing unprofitable investments (Trimintasih, et al, 2016).

In this research, the object observed was Amalia Bintang Telur. This egg distributor is located in the Cibitung area, Bekasi, West Java. This distributor has a branch located in Kalibata, South Jakarta which is the object of this research. The types of eggs that can be distributed are domestic chicken eggs, duck chicken eggs, yellow village chicken eggs, omega village chicken eggs, Triyas village chicken eggs, and others. Eggs are a product that breaks easily, so proper distribution is needed so that the product reaches consumers in good condition. In distributing eggs, the distributor in this study has a vehicle in the form of a Grandmax type pick-up car. The car's carrying capacity is 1800 kg/1.8 tons. In the delivery process, this distributor makes deliveries every two days based on the order of demand

points that place orders first. The problem faced by this distributor is that there are frequent delays due to a lack of vehicles, while there is high demand to be met. From 2021 to 2022 there will be an increase in demand for eggs as can be seen in the image below

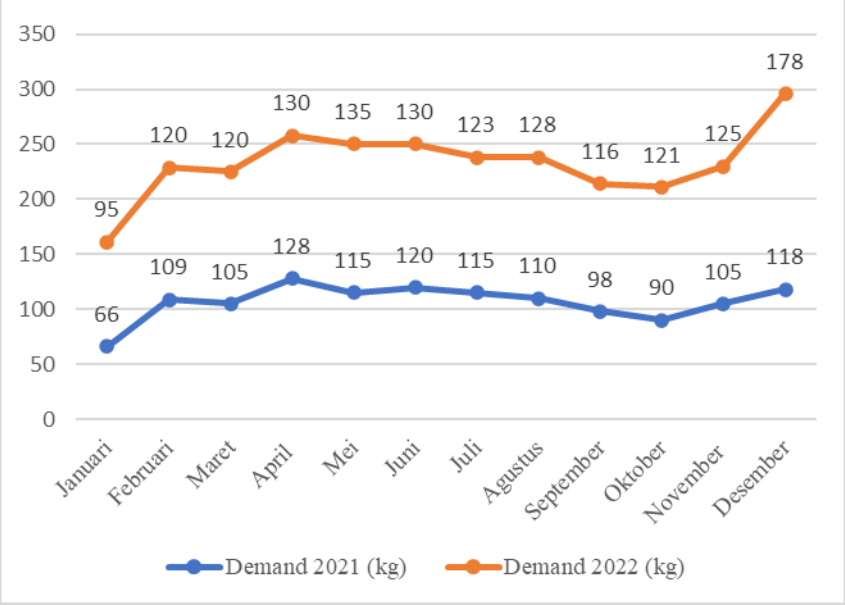

Figure 1. Egg Demand Graph

In dealing with this delay problem, distributors usually negotiate first with customers. If this problem continues and the right solution is not found, the level of customer satisfaction will decrease.

Based on the problems above, analysis is needed to see whether adding a pick-up vehicle of the same type is worth investing in or not based on financial analysis. The purpose of this feasibility study is to avoid the risk of future losses, simplify planning, simplify work implementation, facilitate supervision and facilitate management of an investment that will be made (Asman, 2020). This study uses several methods to analyze investment feasibility, including Net Present Value (NPV), Payback Period, Internal Rate of Return Rate (IRR), and Sum of Years Digits Depreciation (SOYD).

Based on research entitled Analysis of the Feasibility of Investments Made at PT Lemindo Abadi Jaya Daratan Riau to Increase the Transport Fleet and Improve Storage Systems written by Petir Papilo and Ramadanhil, it has the same goal of increasing the transport fleet. The problem faced by the company is that Lemindo Abadi Jaya products are experiencing product run out. This encourages copanies to hire goods delivery services to help distribute products so as not to disappoint customers.

Due to the high cost of expeditions, the company plans to increase transportation. The aim of this research is to analyze the possibility of improving transportation by reducing expedition costs. This feasibility study uses the present value method, the results of which show that this investment is feasible because the resulting value is greater than 0 (Papilo, 2013). In the research entitled Feasibility Study of Investment Plans for Additional Fixed Assets written by Intan Permana, Muhammad Saifi and Zahroh ZA, there were problems in the availability of the number of bus fleets

owned which sometimes did not meet expectations. This is due to the number of requests increasing along with the services and promos offered. Therefore, this company will add 1 bus fleet. The aim of this research is to analyze the feasibility analysis for increasing the bus fleet.

The results obtained using the NPV method state that this investment is feasible because the value obtained is greater than 0. To determine the length of time for repayment of investment funds, this research uses the PP method, the results of which state that the investment is feasible in 3 years 2 months and faster 19 days of the 10 year loan term (Wijayanto, 2012). In research conducted by Handoyo, Adiancha Reival Atvidi and Iriani at PT. PXYZ regarding the Feasibility Study of Investment in Purchasing Truck Transport Equipment for Distribution using the NPV (Net Present Value) and MARR (Minimum Attractive Return) Methods has the same goal of improving transport equipment. The problem faced by PT XYZ Surabaya is that there are several delivery operations every week, causing excessive maintenance costs. In this case PT. XYZ plans to invest in ownership of transportation equipment by considering financial feasibility. Based on the results and discussion of the NPV, PP, ROR and MARR methods, it was found that the project was considered economically feasible (Handoyo, et al, 2020).

METHODS

The types of data in this research are qualitative and quantitative data. Qualitative data taken from direct interviews in the form of information, information, explanations, opinions and responses from the owner. Meanwhile, the quantitative data obtained is in the form of historical egg demand data covered by distributors in this research.

In analyzing the feasibility of an investment, there are several methods that can be used in this research, including:

Net Present Value (NPV)

Method used to determine the feasibility of a business. In the NPV method, the difference between the benefits or revenues and the costs incurred is calculated. A company can use the NPV method to evaluate decisions regarding whether or not an investment is worth making, whether in the form of a project or the addition of new assets. Net Present Value (NPV) is also known as net present value (Pahlevi, et al, 2014). The NPV value can be calculated using the equation below:

$$\begin{aligned} NPV &= \text{PV Benefit - PV Cost} \\ &= B - C \end{aligned}$$

Variable B is the benefit or income that has been discounted. Variable C is the costs incurred which have been discounted.

In the assessment criteria for the NPV calculation results, there are 3 assessment criteria, including, if the NPV value is more than 0, then an investment is worth making. If the NPV is less than 0, then the project proposal is rejected. If NPV is 0, the company value remains whether the project proposal is accepted or rejected. If the NPV value is positive (NPV>0), it means that the return is greater than the

value invested. If the NPV value is negative (NPV<0) it indicates that the income obtained from the investment is less than the expenditure or the investment is lost by considering the Time Value of Money. However, if the NPV calculation result is zero (NPV = 0), it can be interpreted that an investment or purchase is only a return on invested capital (no profit and no loss).

The larger the positive number, the more approvals there are for an investment. Therefore, this net worth calculation not only functions to assess whether an investment is profitable or not, but is also used to compare which investment is better if there are two or more possible investments.

Payback Period (PP)

Payback Period according to Dian Wijayanto, it means the period required to recoup investment expenditure/ Initial Cash Investment (Wijayanto, 2012). The following is the formula used to calculate PP:

$$PP = (\text{Nilai Investasi})/(\text{Kas Masuk Bersih})$$

The decision criteria for this Payback Period method are to see whether the investment plan to be carried out is economical or not. Using the PP method, investment is said to be feasible if $k \leq n$ and vice versa. The variable k represents the number of payback periods. The variable n represents the investment age (Giatman, 2011). The advantage of using the payback period method is that it can be calculated easily and simply to determine the length of time needed to return funds from an investment, provides information on the duration of project profitability, and can be used as a risk assessment tool for an investment.

Internal Rate of Return (IRR) Internal rate of return orInternal Rate of Return(IRR) is the interest rate that provides a net present value (NPV) equal to the company's total investment (Wijayanto, 2012) . This IRR value shows the company's actual ROI value. Formula for calculatingInternal Rate of Return(IRR) is as follows:

$$IRR = i1+NPV1/(NPV1-NPV2) \quad x\ (i2-i1)$$

Information:

IRR = the interest rate that the price is looking for

I1 = the value of the interest rate when the last NPV is positive

I2 = the value of the interest rate when the last NPV is negative

NPV 1 = The last NPV is positive

NPV 2 = The last NPV is negative

The advantage of the Internal Rate of Return (IRR) is that it does not take into account the time value of money. Thus, calculations can be carried out more accurately and realistically than calculating

ARR. The weakness of IRR (Internal Rate of Return) is that it requires a longer calculation time, including calculating cash flows that cannot be divided equally.

Depreciation

Depreciation is a cost charged to consumers through calculating the cost price (Prihastono, 2015). From this it can be concluded that depreciation is a component of fixed costs arising from the use of fixed assets and is charged to consumers in each period (Saifi, 2017).

The depreciation method is Sum of Annual Depreciation (SOYD), ie. H. depreciation of the value of goods, vehicles or equipment over several years where every tool and machine that we use to support distribution or production in the company's industrial system experiences depreciation in value because it needs to be calculated. what is the annual value of the vehicles the company owns, so that a company can make alternative policy decisions in its own company regarding the sustainability of the industrial system (Saifi, 2017).

RESULTS AND DISCUSSION

These results and discussion contain calculations of the methods used in this research. The following are several cost aspects that must be used in the calculation:

Initial Investment Costs

Distributor Amalia Bintang Telur plans to purchase a vehicle in the form of a Grandmax PU Pick Up car for the egg distribution process. Based on the information obtained, the price of a pick-up car of this type is IDR 151,500,000 with the vehicle's economic life being 8 years in accordance with the Regulation of the Minister of Finance of the Republic of Indonesia Number 96/PMK.03/2009. The following are the specifications of the pick-up car that you will invest in.

Tabel 1. Daihatsu Specifications Grandmax PU

Vehicle Specifications	
Price	Rp. 151,500,000.
Carrying Capacity (kg)	1950
Fuel Tank Capacity (Liter)	43
Engine capacity (cc)	1495
Height (mm)	1850
Length (mm)	4195

Cash In Flow

The income earned by this distributor comes from selling eggs. Each type of egg has a different price per kilogram. Usually eggs are sold per 30 kilograms. The following is the income earned by distributors from egg sales.

Tabel 2. Company Income

Year	Demand (kg)	Income
2021	1279	Rp. 820,265,010.00
2022	1521	Rp. 972,134,970.00

Cash Out Flow

Cash Out Flowrepresents expenses incurred by distributors to support their company's operational activities. The expenses that must be incurred by the Amalia Bintang Egg Distributor consist of labor salary costs, electricity and water costs, maintenance costs, and vehicle depreciation costs. The following is a breakdown of the costs incurred:

a) Employee Salary Cost

Employee salary costs are costs incurred by the party providing work as wages for its employees. The Amalia Bintang Egg Distributor has 4 employees with a salary of IDR 150,000 per person per day. This distributor makes deliveries for 15 hours per day with an average salary increase assumed to reach 5% each year. The following are the annual salary costs that must be paid:

Tabel 3. Salary Expenses

Information	Amount
Labor	4
Working days/week	6
Salary/person/day	Rp. 150,000
Salary/week	Rp. 900,000
Salary/year	Rp. 187,200,000

b) Cost Maintenance

Maintenance costs are a number of costs incurred by the company to carry out operations and repairs. A vehicle must require maintenance so that the engine is in good condition. These

distributors must routinely carry out maintenance on their vehicles so that the egg distribution process can run smoothly. The following are the costs incurred by this distributor to carry out maintenance on Pick Up cars.

Tabel 4. Cost Pick-Up Car Maintenance

Information	Amount
Service Services/ Multiples of 10000 km	Rp. 1,900,000
KIR fees	Rp. 105,000
Cost/year	Rp. 11,505,000

c) Electricity and Water Costs

This distributor costs IDR 150,000 per month in 2021 for electricity and water. In 2022, expenditure on electricity and water costs will increase by IDR 50,000 to IDR 200,000. Electricity and water expenses per year can be seen in table 5.

Tabel 5. Electricity and Water Costs

Year	Electricity and Water (Rp/month)	Electricity and Water (RP/year)
2021	Rp. 150,000	Rp. 1,800,000,000
2022	Rp. 200,000	Rp. 2,400,000,000

The following is a breakdown of distributor expenses in 2021 and 2022:

Tabel 6. Cash Out Flow in 2021

Fee Type	Amount
Salary expenses/year	Rp. 187,200,000
Fuel Costs/year	Rp. 14,448,000
Electricity and water costs	Rp. 1,800,000
Vehicle Maintenance Costs/year	Rp. 11,505,000
Total	**IDR 214,953,000**

Tabel 7. Cash Out Flow in 2022

Fee Type	Amount
Salary expenses/year	Rp. 187,200,000
Fuel Costs/year	Rp. 20,640,000
Electricity and water costs	Rp. 2,400,000
Vehicle Maintenance Costs/year	Rp. 11,505,000
Total	IDR 221,745,000

Vehicle Depreciation Costs using the SOYD Method

Depreciation costs are also known as depreciation costs incurred due to a decrease in the value of the vehicle due to the increasing age of the vehicle. The following are vehicle depreciation costs from Amalia Bintang Egg Distributor after 8 years:

a. Initial value of the vehicle (P) = IDR 151,500,000
b. Economic life (N) = 8 years
c. Residual value of the vehicle = $\frac{151.500.000}{8}$

= Rp. 18,937,500.00

$$d_t = \frac{N - t + 1}{SOYD}$$

Tabel 8. Vehicle Depreciation

Year	End of year depreciation	Book value
0		Rp. 151,500,000.00
1	Rp. 29,458,333.00	Rp. 122,041667.00
2	Rp. 25,776,041.00	Rp96,265,626.00
3	Rp. 22,093,750.00	Rp. 74,171,876.00
4	Rp. 18,411,458.00	Rp. 55,760,418.00
5	Rp. 14,729,166.00	Rp. 41,031,252.00
6	Rp. 11,046,875.00	Rp. 29,984,377.00
7	Rp. 7,364,583.00	Rp. 22,619,794.00
8	Rp3,682,291.00	Rp. 18,937,503.00

Cars are classified as an asset that experiences depreciation. Unlike fixed assets, the value of depreciating items decreases every year. Therefore, car prices tend to decrease every year. It can be seen from the table above that using the SOYD method, in the first year there was a decline in book value of 19.44%, but after that, the depreciation in value will slow down with the depreciation percentage continuing to decrease by 2.34% until the eighth year.

Net Present Value Method

The following is the Net Cash Flow (NCF) obtained based on the reduction between distributor income and expenses:

Tabel 9. Net Cashflow

Year	**Income (Rp)**	**Expenditure (Rp)**	***Net Cash Flow* (NCF)**
2021	Rp. 820,265,010	IDR 214,953,000	Rp. 605,312,010
2022	IDR 972,134,970	IDR 221,745,000	Rp. 750,389,970

Based on the table above, the Net Cash Flow (NCF) value is obtained from the reduction between income and expenses. The NCF obtained in 2021 was IDR 605,312,010, while the NCF in 2022 increased to IDR 750,389,970. There was an increase in the NCF value of IDR 145,077,960.

Tabel 10. Net Present Value (NPV)

Year	**Net Cash Flow (NCF)**
0	-Rp. 151,500,000.00
1	Rp. 605,312,010.00
2	Rp. 750,389,970.00
NPV METHOD	IDR 942,260,893.38

Based on data processing using Excel software, an NPV value of IDR 942,260,893.38 was obtained. The NPV value is greater than 0 so it can be concluded that the investment proposal for additional trucks for this distributor will be accepted or can be said to be worthy of investment.

Payback Period Method

The payback method is used to determine the time required for cash flows to recover the cost of the initial investment. The initial investment value given to purchase the vehicle is IDR 151,500,000.00. Based on calculations carried out using Excel software, the results of the payback period method are presented in the table below:

Tabel 11. Payback Period

Year	***Cash Flow (CF)***	***Cumulative Cash Flow***
0	-Rp. 151,500,000.00	-Rp. 151,500,000.00
1	Rp. 605,312,010.00	Rp. 453,812,010.00
2	Rp. 750,389,970.00	Rp. 1,204,201,980.00
Payback period	-0.22	

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Year	**Income (Rp)**	**Expenditure (Rp)**	***Net Cash Flow*** **(NCF)**
2021	Rp. 820,265,010	IDR 214,953,000	Rp. 605,312,010
2022	IDR 972,134,970	IDR 221,745,000	Rp. 750,389,970

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0	-Rp. 151,500,000.00	-Rp. 151,500,000.00
1	Rp. 605,312,010.00	Rp. 453,812,010.00
2	Rp. 750,389,970.00	Rp. 1,204,201,980.00
Payback period	-0.22	

Based on the table above, it can be seen that the payback period method or returns occur in the 1st year. This can be seen in the first year, the cumulative cash flow value was positive at IDR 605,312,010.00 and the Cumulative Cash Flow was IDR 453,812,010.00. Then in the 2nd year with a Cash Flow of IDR 750,389,970.00 and a Cumulative Cash Flow value of IDR 1,204,201,980.00. Obtained payback period results of -0.22. This means that the payback period for this investment occurs in the 1st year.

Internal Rate of Return (IRR) Method

The criteria for the feasibility of investing using this method is that if the IRR value obtained is greater than the (MARR) used by the company, it can be said that the investment is worth making. The MARR value used by this distributor is based on Bank Indonesia (BI) interest, which is 15%. The results of the IRR calculation can be seen in the table below:

Tabel 12. Internal Rate of Return (IRR)

Year	**Net Cash Flow (NCF)**
0	-Rp. 151,500,000.00
1	Rp. 605,312,010.00
2	Rp. 750,389,970.00
IRR METHOD	399%

Based on the calculations carried out, an IRR of 399% was obtained, this value is greater than the MARR value used, namely 399% > 15%. From this it can be concluded that investing in additional vehicles in the form of pick-up cars is feasible.

CONCLUSION

Egg Distributor Amalia Bintang plans to purchase a Grandmax PU Pick Up vehicle for the egg distribution process. Based on the information received, the price of the truck to be invested is IDR 151,500,000 with an economic life of 8 years. This investment feasibility analysis uses several methods, including Net Present Value (NPV), Internal Rate of Return (IRR) and Payback Period (PP). Based on the NPV method, it can be seen that this investment is worth investing in, because the NPV value is positive, namely IDR 942,260,893.38. Based on the PP method, this investment is feasible. This is because the return on investment occurs in the 1st year, so it can be seen that the accumulated value in the 1st year is positive, namely IDR 453,812,010.00. Based on the IRR method, this investment is profitable because the IRR value obtained is higher than the MARR used by the company based on Bank Indonesia (BI) interest, which is 15%, while the IRR value obtained is 399%. From these three methods, it can be concluded that investing in a vehicle in the form of a pickup truck is feasible for this distributor.

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