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# Feasibility Analysis of Investment Project Addition of Printing Machine with Capital Budgeting Method in Aulia Mandiri Printing

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## Abstract

This study aims to analyze Aulia Mandiri Printing in making investments or procurement of fixed assets in order to maintain the stability of production and produce more printing products so that consumer demands can be met.The source of data in this study is a financial statement consisting of a 2021 income statement. This type of research is descriptive quantitative.The types of data in this study are primary and secondary data. While the data analysis method used is projection with measurement and forecasting methods which are then used to calculate investment feasibility.

**Keywords:**
Capital Budgeting, Investment Decision, IRR, NPV, PB, PI

## 1. Introduction

### 1.1. Research Background

Indonesia's economy is currently experiencing a fairly rapid development. This is characterized by the number of new businesses that have emerged, ranging from small-scale businesses to large-scale businesses. Businesses that are in great demand by the public are businesses engaged in services. Every company in carrying out business activities has goals, both short-term and long-term goals. The short-term goal to be achieved by the company is the achievement of profit or profit so that the continuous availability of funds to be able to operate the company on a daily basis. The long-term goal to be achieved is to ensure the survival of the company and future development. There is a huge variety of forms of investment activity. According to Husen Sobana (2018) Dadang Husen, 2018 there are 6 (six) kinds of investment forms, including: establishing a new business, expanding the business or expanding finances, rehabilitating machines that has decreased efficiency, rebuilding machines (rebuilding), changing distribution channels, from distribution through intermediaries to distribution through agents / branches owned the company itself, conducts research to find more efficient processes, creates new products, and improves management information systems.

Overall, this form of investment requires considerable funds in its implementation and the expenditure of these funds /capital will generally affect the company in the long run. The expenditure of funds that are large enough and bound in the long term in an investment activity makes capital owners (investors) have to be careful not to invest funds for projects that turned out to be unprofitable (failed) at a later date, for example, planning errors, errors in assessing the market, errors in technological forecasts that appropriate use, and errors in estimating labor needs. Therefore, it is necessary to hold a feasibility study of the project. A project feasibility study is research on whether or not a project (usually an investment project) is implemented successfully Dayananda et al. (2002)

The larger the scale of investment, the more important this study is carried out because the larger the scale of investment, the greater the amount of funds invested. Although this feasibility study will be costly, the cost is real when compared to the risk of failure of a project that involves a large amount of investment. Before carrying out a feasibility study, it must first be determined what aspects will be studied because it is these aspects that will determine whether an investment project is whether it is worth it or not to be implemented. One of the feasibility studies that must be carried out to determine whether an investment project is feasible or not is a feasibility study from the financial aspect In Bierman & Smidt (2007) general, decisions regarding replacement investment is the simplest, for example an asset that has been worn out (wear-out) or obsolete (obsolete) that must be replaced with new assets , if production will continue Peterson Drake & Fabozzi (2002). One of the service companies engaged in printing and advertising or advertising in the city of Surabaya is Aulia Mandiri Printing. The company, which was founded in 2016, serves the manufacture of banners, banners / frontline, stickers, roll up banners, x-banners, and business cards. During the five years of establishment of Aulia Mandiri Printing Company, it received a good response from the people of Surabaya and its surroundings.

From the wide range of products offered, the company is well aware that the demand for banners is indeed the most widely produced.

From the explanation above, it shows the importance of the financial sector, the topic that I will examine is about Capital Budgeting to measure the feasibility of expansion to be carried out by Aulia Mandiri Printing and I chose the title as follows "Feasibility Analysis of Investment Project Addition of Printing Machines with Capital Budgeting in Aulia Mandiri Printing House"

### 1.2. Problem Formulation

1. How to assess the feasibility of an investment project for a new machine at Aulia Mandiri Printing Through a Payback Period (PP) analysis?
2. How to assess the feasibility of an investment project for a new machine at Aulia Mandiri Printing Through Net Present Value (NPV) analysis?
3. How to assess the feasibility of the investment project for a new machine Aulia Mandiri Printing through Profitability index (PI) analysis?
4. How to assess the investment feasibility of a new machine Aulia Mandiri Printing through the analysis of the Internal Rate of Return (IRR)?

## 2. Research Objectives

1. To analyze the application of the capital budgeting method in calculating the feasibility of the fixed asset investment project at Aulia Mandiri Printing
2. To assess the feasibility of the fixed asset investment project carried out by Aulia Mandiri Printing

### 2.1. Research Benefits

1. For Writers

This research is expected to be a means to increase knowledge and insight into what techniques are used in conducting capital budgeting analysis and can apply the theories obtained during college.

2. For Universities

The results of this study are capable and can be used as a reference for writing and subsequent researchers, especially in inventory case studies.

3. For Companies

The company can find out whether this investment project is feasible to implement or not.

## 3. Research Methods

### 3.1. Research Approach

The research carried out is descriptive research, namely by collecting, classifying, analyzing and interpreting data related to the problems faced and comparing technical knowledge (primary data) with the actual situation in the company to then draw conclusions.

### 3.2. Research Site

This research was conducted at JL. Semampir Tengah 4A / 11, Kec. Sukolilo, Surabaya, East Java.

### 3.3. Operational Definition of Variables

#### 3.3.1. Capital Budgeting

Capital budgeting is the process of identifying, analyzing and selecting investment activities whose returns are expected for more than one year.

### 3.4. Data Types and Sources

The type of data used in this study is qualitative data, which is in the form of financial report documents of Aulia Mandiri Printing. The data is secondary and primary data, namely data obtained from the company in the form of financial report data of Aulia Mandiri Printing.

## 4. Results and Discussion

### 4.1. Initial Investment

Aulia Mandiri Printing plans to buy a Digital Printing machine to maximize its performance and service. In addition, Aulia Mandiri Printing wants to continue to increase income. And Aulia Mandiri Printing Has prepared funds of around IDR. 150,000,000 for this fixed asset investment.

Initial Investment: IDR. 150,000,000

### 4.2. Income Statement

One of the important things in the issue of investment policy is to make an estimate of the expenditure of money that will be received from the investment in the future. Fixed assets are generally obtained by requiring large enough funds, for that the company must have a capitalization policy that sets the minimum amount of expenses, this means expenses below the minimum amount must be charged as the company's operating expenses which are included in the income statement in the period at the time of the occurrence of expenses.

Table 1. Recapitulation of The Income Statement Aulia Mandiri Printing
For the Year Ends December 2017-2021

| Report Profit and Loss | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| | (IDR.) | (IDR.) | (IDR.) | (IDR.) | (IDR.) |
| Sales | 430.668.000 | 473.734.800 | 521.108.280 | 573.219.108 | 630.541.019 |
| Cost of Goods Sold | | | | | |
| Total Cost of Goods Sold | (297.297.400) | (327.027.140) | (359.729.854) | (395.702.839) | (435.273.123) |
| GROSS PROFIT | 133.370.600 | 146.710.660 | 161.378.426 | 177.516.269 | 195.267.896 |
| Operating Expenses | | | | | |
| Total Operating Expenses | (51.362.944) | (56.499.238) | (62.149.162) | (68.364.072) | (75.200.486) |
| Operating Profit | 82.007.656 | 90.211.422 | 99.229.264 | 109.152.197 | 120.067.410 |
| Assumptions Up 10% | | | | | |
| Net Profit Before Tax | 82.007.656 | 90.211.422 | 99.229.264 | 109.152.197 | 120.067.410 |
| Income Tax | (12.301.148) | (13.531.713) | (14.884.389) | (16.372.829) | (18.010.111) |
| Net Profit After Tax | 69.706.508 | 76.679.709 | 84.344.875 | 92.779.368 | 102.057.299 |

Judging from the projections of the financial statements, the profit and loss above is calculated to be a very promising business from the net profit obtained increase every year. In year 2021 produced a net profit of IDR. 69,706,508, in 2022 became IDR. 76,679,709, in 2023 became IDR. 84,344,875, in 2024 IDR. 92,779,368 and in the last year 2025 an increase of IDR. 102,057,299.

#### 4.2.1. Depreciation

Depreciation Calculation in the calculation of investment depreciation of fixed assets, it uses the Straight-Line Method, with the formula:

$$\frac{\text{Cost of an asset} - \text{Resudual Value}}{\text{Usefull Life of Asset}}$$

$$= \frac{(150.000.000 - 0)}{5}$$

= IDR. 30,000,000

Table 2. Earnings before Depreciation

| | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| Profit Before depreciation | IDR. 69,706,508 | IDR. 76,679,709 | IDR. 84,344,875 | IDR. 92,779,368 | IDR. 102,057,299 |

Table 3. Depreciation By the Straight-Line Method

| Year | Depreciation Costs | Accumulated Depreciation Costs | Book Value |
|---|---|---|---|
| 1 | IDR. 30,000,000 | IDR. 30,000,000 | IDR. 120,000,000 |
| 2 | IDR. 30,000,000 | IDR. 60,000,000 | IDR. 90,000,000 |
| 3 | IDR. 30,000,000 | IDR. 90,000,000 | IDR. 60,000,000 |
| 4 | IDR. 30,000,000 | IDR. 120,000,000 | IDR. 30,000,000 |
| 5 | IDR. 30,000,000 | IDR. 150,000,000 | IDR. - |

(Source: Author: 2022)

Table 4. Cash In Flow

| Year | 1 (Idr) | 2 (Idr) | 3 (Idr) | 4 (Idr) | 5 (Idr) |
|---|---|---|---|---|---|
| Profit Before Dep. | 69.706.508 | 76.679.709 | 84.344.875 | 92.779.368 | 102.057.299 |
| Less. Dep | (30.000.000) | (30.000.000) | (30.000.000) | (30.000.000) | (30.000.000) |
| Profit Before Tax | 82.007.656 | 90.211.422 | 99.229.264 | 109.152.197 | 120.067.410 |
| Net Profit After Tax | 69.706.508 | 76.679.709 | 84.344.875 | 92.779.368 | 102.057.299 |
| Less. Dep | 30.000.000 | 30.000.000 | 30.000.000 | 30.000.000 | 30.000.000 |
| Cash Inflow | 99.706.508 | 106.679.709 | 114.344.875 | 122.779.368 | 132.057.299 |

(Source: Author 2022)

Estimates on cashflow are things that need to be considered in the capital budgeting analysis process. That is a complicated and complex process that requires careful thinking and calculations so that the projected cash flow estimate is able to approach the cash flow estimate carried out by the company. Thus, an assessment of the results of the capital budgeting analysis will provide an accurate assessment of the determination of investment decisions.

### 4.3. Investment Feasibility Evaluation Method

#### 4.3.1. Payback Period

The Payback Period shows how long the timeframe is hinted at to return the value of the investment by dividing the total initial investment by the total proceeds per year. On this investment the maximum proceeds with regard to its economic life is estimated at 5 years. Furthermore, the calculation of PP assuming constant proceeds (annuity) every year can be calculated as follows:

Table 5. Payback Periods

| Years | Cf (Cash Flow) |
|---|---|
| 0 | Idr. (150,000,000) |
| 1 | Idr. 99,706,508 |
| 2 | Idr. 106,679,709 |
| 3 | Idr. 114,344,875 |
| 4 | Idr. 122,779,368 |
| 5 | Idr. 132,057,299 |

(Source: Author: 2022)

$$PP = \frac{\text{IDR. } 150.000.000}{\text{IDR. } 575.567.759} \text{ x 12 Months}$$

$$= 3.1 \text{ years}$$

$$= 3 \text{ years } 1 \text{ month}$$

By paying attention to the results of the PP mentioned above for 3.1 years while the maximum proceeds from this printing unit are 5 years, the rate of return on the investment value is faster compared to the maximum value of its proceeds so that Aulia Mandiri Printing Investment is feasible to run.

### 4.3.2. Net Present Value (NPV)

Net present value pays attention to the net present value on the basis of the time value of money that will come to be assessed at the present time. This will be obtained from the difference between the present value of proceeds and the present value of initial investment by taking into account the economic age and a certain discount rate. Here's the calculation:

Table 6. Net Present Value

| Year | Cf | DF 10% | Pv |
|---|---|---|---|
| 0 | IDR (150,000,000) | 1 | IDR. (150,000,000) |
| 1 | IDR. 99,706,508 | 0,909 | IDR. 90,633,216 |
| 2 | IDR. 106,679,709 | 0,826 | IDR. 88,117,440 |
| 3 | IDR. 114,344,875 | 0,751 | IDR. 85,873,001 |
| 4 | IDR. 122,779,368 | 0,683 | IDR. 83,858,308 |
| 5 | IDR. 132,057,299 | 0,621 | IDR. 82,007,582 |

(Source: Author: 2022)

$$NPV = \frac{\sum CF}{(1+i)^n} - CI$$

= IDR. 357,382,294 - IDR. 150,000,000
= IDR. 207,382,294

In the calculation table above, Net Present Value uses DF of 10%. From the results of the table above, it is then calculated using the NPV formula above and from the calculation results above, it shows that this investment plan can be carried out because the NPV value shows a positive number of IDR. 207,382,294, so that this investment is financially feasible for run.

### 4.3.3. Profitability Index (PI)

Using the 10% discount rate mentioned above, the profitability index (PI), can be calculated by comparing pv of cash inflow with pv of initial investment. From the results of the NPV calculation mentioned above, the following results were obtained:

$$PI = \frac{\text{Present Value Of Cash In Flow}}{\text{Present value of cash outflow}}$$
$$= \frac{\text{Rp 575.567.759}}{\text{Rp 150.000.000}}$$
$$= 3.83$$

In calculating the Profitability Index by entering the formula for calculating pi. And from the calculation of the profitability index (PI) obtained a value of 3.83, meaning that it is greater than the number 1, so this investment is worth running.

### 4.3.4. Internal Rate of Return (IRR)

The internal rate of return calculates the interest rate that equals the present value of the proceeds value. The IRR is used as a benchmark for the level of the project's ability to produce proceeds up to the same as the initial investment then compared to the level of its cost of capital. To obtain the value, an interpolation approach is carried out by calculating a positive NPV with a negative NPV, so that a certain discount factor will be eliminated that produces an NPV value equal to the 0, with the formula:

Table 7. Internal Rate of Return

| Year | Cf | Df 10% | Py | Df 12% | Py |
|---|---|---|---|---|---|
| 0 | (150,000,000) | 1 | (150,000,000) | 1 | (150,000,000) |
| 1 | IDR. 99,706,508 | 0,909 | IDR. 90,633,216 | 0,892 | IDR. 88.938.205 |
| 2 | IDR. 99,706,508 | 0,826 | IDR. 88,117,440 | 0,797 | IDR. 85.023.728 |
| 3 | IDR. 114,344,875 | 0,751 | IDR. 85,873,001 | 0,711 | IDR. 81.299.206 |
| 4 | IDR. 122,779,368 | 0,683 | IDR. 83,858,308 | 0,635 | IDR. 77.964.898 |
| 5 | IDR. 132,057,299 | 0,621 | IDR. 82,007,582 | 0,567 | IDR. 74.876.488 |

(Source: Author: 2022)

$$\text{IRR} = \text{Lower Rate} + \frac{\text{Positive NPV}}{\text{Positive NPV} - \text{Negativ NPV}} + \text{Different In Discount Rate}$$

$$= 10\% + \frac{207.382.294}{207.382.294 - 176.592.916} + 2$$

$$= 10\% + 6.7 + 2$$

$$= 18.7\%$$

The result of the IRR calculation is obtained by the IRR value of 18.7%, greater than the interest rate used for the cost ofcapital of the initial investment of 10% percent, so this investment is worth running.

## 5. Conclusions and Suggestions

1. Based on the results of the research that has been carried out, several conclusions can be drawn as follows:
   a. Based on thefinancial analysis obtained from the calculation of the Payback period of the investment to be carried out by Aulia Mandiri Printing, it is feasible to run because it shows PP 3.1 years faster than the maximum period of 5 years.
   b. Based on the results of a positive Net Present Value (NPV) research of IDR. 207,382,294, it is stated that this investment is feasible to be implemented
   c. Based on the results of the study showing a Profitability Index (PI) of 3.83 greater than number 1, it is stated that this investment is feasible to run
   d. Based on the results of the study, it shows that the IRR of 18.7% is greater than the cost of capital value of 10%, it is stated that this investment is feasible to run.
   e. By paying attention to the results of these quantitative values as the basis for making decisions through a capital budgeting approach through financial analysis, this investment is financially "FEASIBLE" to run.
2. Suggestion

After describing some of the conclusions mentioned above, it is necessary to put forward some suggestions related to fixed asset investment that can be considered in making decisions in the future. The suggestions that can be put forward are as follows:

a. For Companies
   1) The decision regarding investment in fixed assets is a decision that largely determines the success of the company, since the decision regarding investment relates to large funds and a relatively long time.
   2) Companies in investing their funds in an investment proposal need toanalyze whether the investment proposal is really feasible or not to be implemented, because then the risk of persistence that will be suffered by the company will be smaller.
   3) The results of the calculation of the investment feasibility analysis show that this investment is feasible to implement

b. For Future Researchers

   The next researcher in conducting research related to the feasibility of the fixed asset investment proposal should pay attention to aspects that can affect the feasibility of the investment proposal, so that the results obtained later are really valid, the investment proposalcan provide maximum benefits and do not cause a negative impact on the company that will make the investment proposal.

## References

Arifin, M. A., & Daryanto, W. M. (2018). Cost Reduction Strategy In Distribution Pipeline In Perspective Of Capital Budgeting: A Case Study In Area “C” Greenland International Industrial Center (Giic). http://ijbel.com/wp-content/uploads/2019/01/ECON-60.pdf

Bhakti, H., Setiawan, B. I., & Soeroto, W. M. (2021). Analisa Kelayakan Investasi Spbu Mikrosite Indomobil Di Desa Grajagan. Sebatik, 25(2), 296–302. https://doi.org/10.46984/sebatik.v25i2.1547

Bierman, H., & Smidt, S. (2007). Advanced capital budgeting : refinements in the economic analysis of investment projects. Routledge. https://www.routledge.com/Advanced-Capital-Budgeting-Refinements-in-the-Economic-Analysis-of-Investment/Bierman-Jr-Smidt/p/book/9780415772068

Dayananda, D., Irons, R., Harrison, S., Herbohn, J., & Rowland, P. (2002). Capital Budgeting: Financial Appraisal of Investment Projects. https://doi.org/10.1017/CBO9780511753701

Hidayah, I., & Ningsih, L. R. (2015). Implementation of Capital Budgeting for MSME in Fixed Assets Investment Decisions Through Andragogy Approachment. Scientific Journal of PPI - UKM, 2(5), 219–227. http://kemalapublisher.com/index.php/ppi-ukm/article/view/97

Husen Sobana, H. D. (2018). Studi Kelayakan Bisnis. Pustaka Setia.

Kerihi, A., & Yunita, Y. (2021). Analisis Kelayakan Investasi Pembuatan Bagan Apung Baru. Jurnal Akuntansi : Transparansi Dan Akuntabilitas, 9(1), 109–118. https://doi.org/10.35508/jak.v9i1.3984

Mafazi, M. A. (2018). Capital Budgeting Analysis in Digital Marketing Activities at Yes Cake , Bakery. International Journal of Business Management & Research, 8(6), 1–8. https://doi.org/10.24247/IJBMRDEC20181

Mentari, D., & Daryanto, W. M. (n.d.). Capital Budgeting Model And Sensitivity Analysis Of The Project Feasibility In Vietnam For The Period Of 2019-2037. International Journal of Business, Economics and Law, 17(2).

Peterson Drake, P., & Fabozzi, F. J. (2002). Capital budgeting : theory and practice. 243. https://www.wiley.com/en-us/Capital+Budgeting%3A+Theory+and+Practice-p-9780471218333