



Information Technology Investment Benefit Analysis Using the Cost Benefit Analysis Method and Ranti's Generic IS/IT Business Value Method

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Article Info	Abstract
Article History Received: 2023-02-26 Revised: 2023-03-13 Published: 2023-04-01 Keywords: <i>Information Technology Investment;</i> <i>Cost Benefit Analysis;</i> <i>Ranti's Generic IS/IT Business Value;</i> <i>Comparative Analysis of Financial Statements.</i>	The rapid development of technology affects society. The development of information technology affects the business world today. To overcome all this, companies need breakthroughs by utilizing technology, namely <i>e-commerce</i> . Every organization or company needs to make information technology investments to be able to ensure better performance. The purpose of this study is to find out the benefits resulting from the investment in information technology in the form of online shopping applications by one fashion retail company in Indonesia, namely PT. XYZ. Information technology investment calculation methods used in this study are the financial statement comparison analysis method, <i>Ranti's generic IS/IT business value</i> method, and <i>the cost-benefit analysis method</i> . Through calculations that have been carried out using Ranti's generic IS/IT business value method and the <i>cost-benefit analysis</i> method, it has been determined that the information technology investment is beneficial for the company.
Artikel Info	Abstrak
Sejarah Artikel Diterima: 2023-02-26 Direvisi: 2023-03-13 Dipublikasi: 2023-04-01 Kata kunci: <i>Information Technology Investment;</i> <i>Cost Benefit Analysis;</i> <i>Ranti's Generic IS/IT Business Value;</i> <i>Comparative Analysis of Financial Statements.</i>	Perkembangan teknologi yang pesat mempengaruhi masyarakat. Perkembangan teknologi informasi mempengaruhi dunia bisnis saat ini. Untuk mengatasi semua ini, perusahaan memerlukan terobosan baru dengan memanfaatkan teknologi yaitu <i>e-commerce</i> . Setiap organisasi atau perusahaan perlu melakukan investasi teknologi informasi untuk dapat memastikan kinerja yang lebih baik. Tujuan dilakukannya penelitian ini adalah untuk mengetahui manfaat yang dihasilkan dari dilakukannya investasi teknologi informasi berupa aplikasi belanja online oleh salah satu perusahaan fashion retail di Indonesia yaitu PT. XYZ. Metode perhitungan investasi teknologi informasi yang digunakan dalam penelitian ini adalah metode Analisis Perbandingan Laporan Keuangan, metode Ranti's Generic IS/IT Business Value, dan metode Cost Benefit Analysis. Melalui perhitungan yang telah dilakukan menggunakan metode Ranti's Generic IS/IT Business Value dan metode Cost Benefit Analysis, maka diperoleh hasil bahwa investasi teknologi informasi yang dilakukan bermanfaat bagi perusahaan.

I. INTRODUCTION

At every stage of its formation, humanity is evolving at a faster pace than ever before. The global community is already at the threshold of a new industry revolution (Industry 4.0). Changes due to the transition to a joint-stock company the new stage of development is global and reflected in all areas of the daily life of the world economy (Voronova and Lukina, 2022). Information Technology is not unfamiliar to the people of Indonesia and even to the world. The field of information management is of particular interest to the various technologies and activities that affect behavioral change in customers, people, and organizations (Frizzo-Barker et al., 2020). There are some different approaches to learning more about company operations and people who use IT. Company capability strengthens profit to increase by utilizing acquired knowledge through the use of IT (Alfalah, Muneer and Hussain,

2022). A computerized system is expected to provide convenience in collecting existing information (Walim and Suhardi, 2020). The technological developments that have occurred have affected the use or utilization of the internet in the business world, changing from being used only as a tool for the electronic exchange of information. Now it has been used as a tool for business strategy applications, such as marketing products or services, selling products or services, and customer service.

Technological development affects business development almost everything. Business functions have to make changes to anticipate them (Djaelani and Ali, 2022). In addition to being a challenge for companies, technological developments are also a challenge for people to be able to adapt well to current technological developments. The existence of technology today has removed restrictions for countries around

the world in terms of disseminating information over the internet. The development of information technology greatly affects competition in the business world today, so to overcome all this, companies need to find breakthroughs by utilizing technology. Digital mediation in B2B marketing is becoming more and more important for businesses due to customer needs and evolving technology environment. Therefore, system compatibility can be considered pleasing if it meets criteria, for example, the satisfaction of customer needs and related goals (Kumar et al., 2020).

E-business or electronic business is one of the innovative concepts offered. Any company or business professionals face new opportunities and challenges as a result of the introduction of e-business (Setyowati, Widayanti and Supriyanti, 2021). One of the uses of information technology often used in running a e-business is online shopping applications, often referred to as e-commerce. E-Commerce is the process of buying and selling products or services that utilize electronic devices, such as telephones and the internet. E-Commerce is a description of buying and selling products or services on the internet or through another information network (Estiyanti et al., 2021). Several studies have been conducted to investigate the determinants of customer intent when buying groceries online. No consensus so far on what factors influence people's grocery shopping via internet (Khan, Shams-E-Mofiz and Sharmin, 2020).

Every organization or company needs to invest in information technology to be able to ensure better performance in the field of information technology. Information technology investment is the decision of an organization to invest and allocate all types of resources carried out for the management of information systems in other words, information technology investment is a decision taken to increase resources in the hope that the benefits of the decision can reach the expected value (Haryanti, 2015). After an investment has been made, it must be measured whether the return on investment has been achieved. Measurement issues are an essential barrier to evaluation (Haryanta, Azhari and Mustofa, 2020). Optimizations of the value of information technology investment need to be done so that the number of funds to be spent on information technology investment is not wasted. Therefore, an analysis is needed in information technology investments was carried out to be able to ascertain the benefits of these investment

decisions. By co analyzing information technology investment in a company, it is hoped that the analysis can find out the benefits of the application of information technology. One of the companies that utilize this technological development is PT. XYZ. In April 2018, PT. XYZ launched an online shopping application. Benefits obtained by using the app, namely ease of transactions, and more practical shopping with points, promos, and exclusive discounts specifically for members at all merchants.

II. METHOD

The data collection techniques used in this study are documentation and literature studies. The types of data used in this study are qualitative data and quantitative data. The data source used in this study is secondary data obtained through the annual report of PT. XYZ from 2015 to 2021.

III. RESULT AND DISCUSSION

A. Result

The main purpose of financial reporting is to disseminate financial statements that accurately measure a company's profitability and financial condition (Fridson and Alvarez, 2022). Financial Statement Comparison Analysis is carried out as support in analyzing Ranti's Generic IS / IT Business Value method by analyzing the results of the Financial Statement Comparison Analysis that provides benefits in accordance with the categories and sub-categories of Ranti's Generic IS / IT Business Value. Based on the company's goal of making investments, namely to improve efficiency and improve effectiveness (Indrajit, 2016). The purpose of technology investment in improving effectiveness is carried out by grouping and defining a series of processes within the company that can provide benefits to the company analyzed using Ranti's Generic IS / IT Business Value as to improve efficiency or optimize company resources to obtain benefits both tangible and intangible. This can be analyzed using the Cost Benefit Analysis method. Based on the calculations that have been carried out using three methods, the results obtained are:

1. Financial Statement Comparison Analysis Method

In this method, results were obtained that showed that some company finances have increased and some have decreased in 2019. Meanwhile, in 2020 it experienced a significant decline. The company strives to

be able to get through difficult times in various ways, so that in 2021 there will be some improvements although not significant.

2. Ranti's Generic IS/IT Business Value Method

The results obtained in this method are in the form of benefits obtained by companies based on categories or sub-categories from Ranti's Generic IS / IT Business Value table (Darmizal and Ranti, 2016). There are five benefits of information technology investment obtained and that has been adjusted to Ranti's Generic IS/IT Business Value table, namely **Reducing/reducing Document Printing Costs and ATK (RCO-10), Increasing Productivity Due to Rapid Product Mastery (IPR-02), Increasing Productivity due to Ease of Analysis (IPR-03), Improving Images Caused by Giving Discounts (IIM-02), and Avoiding Maintenance Costs (ACO-02)**

3. Cost Benefit Analysis Method

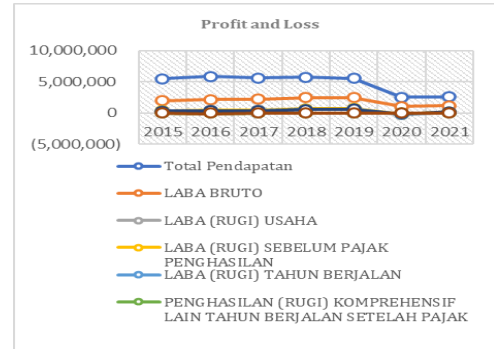
In the CBA method, calculations are made regarding Return on Investment, Net Present Value, Payback Period, Benefit Cost Ratio, and Economic Value Added, whose data is obtained from the Financial Statements of PT. XYZ from 2015-2021. The ROI value obtained is 4.81% which means that the company's ROI can be said to be good because the value obtained is > 0 . The NPV value obtained is Rp. 1,381,745, which means the investment is beneficial to the company. The amount of PP value obtained is 2,128 or 776 days which means that the investment is beneficial because the return time obtained is less than the economic benefit of the company's intangible assets, which is four years. The BCR value obtained is 1.79, which means that the investment made is beneficial because the BCR value obtained > 1 . As for the EVA value of Rp. 78,306, which indicates that the investment made is beneficial or profitable for the company because the EVA value obtained > 0 .

B. Discussion

1. Comparative Analysis of Financial Statements

a) Income Statement

The following is a table of income statements from PT. XYZ from 2015 to 2021. The analysis method used in this study is a horizontal analysis method that aims to compare financial statements for several periods.

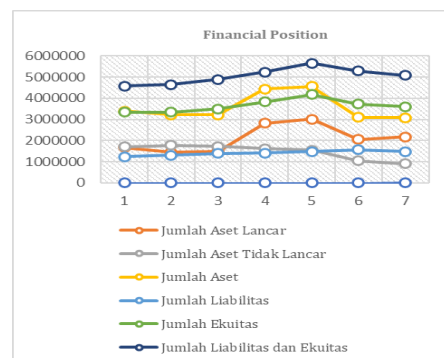


Picture 1. Profit and Loss

A comparative analysis of the Income Statement from 2015 to 2021 states that: From the comparative percentage table of profit and loss financial statements, total revenue in 2019 decreased by 2.49% due to an increase in general and administrative expenses. However, profit for the year increased by 10.35% as financial income in 2019 increased by 38.75% due to bank interest income from cash and cash equivalents (including time deposits and short-term investments).

b) Statement of Financial Position

The following is a table of financial position statements from PT. XYZ from 2015 to 2021. The analysis method used in this study is a horizontal analysis method that aims to compare financial statements for several periods.



Picture 2. Financial Position

A comparative analysis of the Income Statement from 2015 to 2021 states that:

- 1) In 2019, current assets increased by 6.7% from Rp. 2,817,420 in 2018 to Rp. 3,005,960 in 2019. The increase was due to an increase in cash and cash equivalents of 13.2% in 2019.
- 2) Non-current assets in 2019 decreased by 4.3% due to a decrease in fixed assets by 4.9%.
- 3) Liabilities increased in 2019 due to an increase in third-party accounts payable, third-party miscellaneous business debt, and employee benefits liabilities.
- 4) Equity in 2019 experienced an increase due to the increase in the value of retained earnings not yet determined.

2. Analysis of Ranti's Generic IS//IT Business Value

Ranti's Generic IS / IT Business Value method is a method used to show the purpose of making information technology investments according to each category or sub-category. Benefits of information technology investment in PT. XYZ based on Ranti's Generic IS/IT Business Value Method can be seen in the table below:

Table 1. Ranti's Generic IS/IT Business Value

Code	Category	Information
RCO-10	Reducing/reducing document printing costs and ATK	The cost of printing documents and ATK has decreased due to online shopping applications that make many customers shop through the system.
IPR-02	Increase productivity because it is caused by rapid mastery of the product	With the training provided, employees can master the product faster and it can increase the company's productivity.
IPR-03	Increase productivity due to ease of analysis	The company provides a debriefing program that

		aims to improve managerial abilities to the ability to perform analysis for strategizing so that the strategy used can increase the productivity of the company.
IIM-02	Improving images caused by giving discounts	With the online shopping application, it makes it easier for people to find out the discounts provided by the company. With many discounts, the company can attract more customers.
ACO-02	Avoid maintenance costs	It can be seen that the cost of maintenance and repair in 2019 has decreased.

3. Cost Benefit Analysis

The Cost Benefit Analysis method is a process of identifying, determining, and measuring the value of elements related to information technology or investment projects that have a role in the costs that have been incurred and the benefits to be received (Indrajit, 2016). The following are the results of the analysis of the Cost Benefit Analysis Method:

a) Return on Investment

ROI is a method used in Calculate by dividing the mesh. Income to total cost (income-cost) (Ozcan and Ersoz, 2019) and measuring the percentage of benefits obtained by a company compared to the costs incurred by the company. The following is the calculation of Return on Investment at PT. XYZ in millions of rupiah:

$$ROI = \frac{\text{Laba Bersih}}{\text{Biaya Investasi}} \times 100\% \quad (1)$$

$$ROI = \frac{587.105}{12.217.000} \times 100\%$$

$$= 0.0480563968$$

$$= 4.80\%$$

Based on the calculation of Return on Investment at PT. XYZ obtained an ROI value of 4.80% which means that the

investment made can be accepted and provides benefits for the company because it has provided benefits of 4.80% of the total investment cost.

b) Net Present Value

Net Present Value is a method used to compare cash flows that occur at different times, discount the cash flows and shift them to the same period. Discounting accounts for the opportunity cost of capital and adjusts the time value of the element of money (Olaniyi and Prause, 2020). The following is the calculation of the Net Present Value at PT. XYZ in millions of rupiah:

Table 2. Net Present Value

Year	Cash flow	Discount Rate
0	680.634	
1	516.531	6%
2	320.665	
3	2.228	

$$\frac{c^1}{(1+r)} + \frac{c^2}{(1+r)^2} + \frac{c^3}{(1+r)^3} - C^0 \quad (2)$$

$$\frac{516.531}{(1 + 0.06)} + \frac{320.665}{(1 + 0.06)^2} + \frac{2.228}{(1 + 0.06)^3} - 680.634$$

$$= \frac{516.531}{1.06} + \frac{320.665}{1.1236} + \frac{2.228}{1.191016} - 680.634$$

$$= 487,293 + 285,390 + 1,725 - 680,634$$

$$= \text{Rp. } 93.774$$

Based on the calculation of Net Present Value at PT. XYZ above obtained an NPV value of Rp. 93,774 which means that the investment made can be accepted because the NPV value is > 0.

c) Payback Period

Payback Period is a collection methods are not used to measure profitability and only provide interpretable results for decision-making time of investment as the repayment period (Ozcan and Ersoz, 2019). The following is the calculation of the Payback Period at PT. XYZ in millions of rupiah:

$$PP = \frac{\text{Jumlah Investasi}}{\text{Pendapatan}} \times 1 \text{ Tahun} \quad (3)$$

$$PP = \frac{12.217.000}{5.739.553} \times 1 \text{ Tahun}$$

$$= 2,128 \text{ (776 days)}$$

Based on the calculation of the Payback Period at PT. XYZ can be concluded that the investment is feasible or useful because it gets a return on investment of

2,128 or 776 days, which means that the return on investment is faster than the value or economic benefit of the company's intangible assets, which is four years.

d) Benefit Cost Ratio

It is a comparison between the amount of income (benefit) and the total cost (cost). A benefit-cost analysis aims to compare benefits and costs. Various policy options are measured in monetary units. Middle. If the benefits outweigh the costs, it is considered cost-effective. Arranged according to the cost-benefit ratio (Cafiso and D'Agostino, 2020). The following is the calculation of the Benefit Cost Ratio at PT. XYZ in millions of rupiah:

Table 3. Benefit Cost Ratio

Tahun	Pendapatan	Biaya	DF	PV Manfaat	PV Biaya
2018	5.739.553	3.232.948	0,152	872.412	491.408
2019	5.596.398	3.102.317	0,095	531.658	294.720
2020	2.527.951	1.450.362	0,059	149.149	85.571
2021	2.592.682	1.382.622	0,037	95.929	51.157
TOTAL				1.649.148	922.857

$$BCR = \frac{PV \text{ Manfaat}}{PV \text{ Biaya}} \quad (4)$$

$$BCR = \frac{1.649.148}{922.857}$$

$$= 1,79$$

Based on the calculation of the Benefit Cost Ratio at PT. XYZ obtained a BCR value of 1.79 which means that the investment made can be accepted or useful because the BCR value is > 1.

e) Economic Value Added

Economic Value Added is an indicator used to measure a company's performance to measure the added value generated from an investment activity carried out by the company (Tampi and Mukuan, 2016). The following is the calculation of the Economic Value Added at PT. XYZ in millions of rupiah:

$$EVA = NOPAT - CAPITAL CHARGES \quad (5)$$

$$NOPAT \text{ (Net Operating After Tax)} = EBIT (1 - Tax)$$

$$EBIT = \text{Current year profit} + \text{Interest expense} + \text{Tax Expense}$$

$$= 587,105 + 21,960 + 130,067$$

$$= 739,132$$

$$Tax = \frac{\text{Beban pajak}}{\text{Laba sebelum pajak}}$$

$$= \frac{130.067}{717.172}$$

$$= 0.181$$

$$1 - Tax = 1 - 0.181 = 0.819$$

$$NOPAT = \text{Rp. } 739.132 \times 0.819 = \text{Rp. } 605.349$$

Capital Charges = WACC x Invested Capital
WACC (Weighted Average Cost of Capital) =
[(D x rd) (1-Tax) + (E x re)]

$$D = \frac{\text{Total hutang}}{\text{Total hutang} + \text{Total ekuitas}}$$

$$= \frac{1.415.582}{5.243.047}$$

$$= 0.270$$

$$rd = \frac{\text{Biaya bunga}}{\text{Total hutang jangka panjang}}$$

$$= \frac{21.960}{322.487}$$

$$= 0.068$$

$$E = \frac{\text{Total ekuitas}}{\text{Total hutang} + \text{Total ekuitas}}$$

$$= \frac{3.827.465}{5.243.047}$$

$$= 0.730$$

$$re = \frac{\text{Laba tahun berjalan}}{\text{Total ekuitas}}$$

$$= \frac{587.105}{3.827.465}$$

$$= 0.153$$

$$WACC = [(0.270 \times 0.068) (0.819) + (0.730 \times 0.153)]$$

$$= [(0.018) (0.819) + (0.112)]$$

$$= 0.127$$

Invested Capital = (Total debt + Total equity) - Short-term debt = 5,243,047 - 1,093,095

Invested Capital = 4,149,952

Capital Charges = 0.127 x Rp. 4.149.952
= IDR 527,043

EVA = Rp. 605.349 - Rp. 527.043
= IDR 78,306

Based on the calculation of Economic Value Added at PT. XYZ above obtained an EVA value of Rp. 78,306 means that the company's financial performance is in good condition because the EVA value > 0.

IV. CONCLUSIONS AND SUGGESTION

A. Conclusions

Based on the results obtained through the discussion in chapter IV using the Financial Statement Comparison Analysis method, Ranti's Generic IS / IT Business Value method and the Cost Benefit Analysis method, it can be concluded that:

1. Based on the Comparative Analysis of Financial Statements conducted as a supporting method in this study, results were obtained, namely the financial performance of PT. XYZ based on an analysis with a horizontal method on the income statement, total revenue has increased and decreased every year, a significant decrease occurred in 2020, but in 2021 the company managed to increase its total revenue. Meanwhile, in the financial position report, the number of assets, liabilities and equity

until 2019 has increased, especially in 2019, which reached the highest value compared to the previous year, and in 2020 it decreased until 2021.

2. Benefits of investing in Information Technology online shopping applications at PT. XYZ based on Ranti's Generic IS/IT Business Value method is to Reduce Document Printing Costs and ATK (RCO-10), Increase Productivity Due to Fast Product Mastery (IPR-02), Increase Productivity due to Ease of Analysis (IPR-03), Improve Image Caused by Giving Discounts (IIM-02), and Avoid Maintenance Costs (ACO-02).
3. Benefits of investing in Information Technology online shopping applications at PT. XYZ based on the Cost Benefit Analysis method, obtained a Return on Investment of 4.81%, a Net Present Value of Rp. 1,381,745, Payback Period of 2,128 or 776 days, Benefit Cost Ratio of 1.79, and Economic Value Added of Rp. 78,306, which indicates that the investment made provides benefits for the company.

B. Suggestion

Further research can be carried out in more depth using primary data sources obtained through interviews or observations of the object of study. To more easily identify the benefits of information technology investments made. Because this research has limitations, the financial statements were analyzed for only seven years, and the data used are secondary data obtained from the website Indonesia Stock Exchange and PT. XYZ.

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