# Financial Performance Analysis and Business Strategy using Profitability Ratio Analysis: A Case Study

## Almira Zana Pratama

Master Program of Industrial Engineering Department, Faculty of Engineering Universitas Sebelas Maret Surakarta, Indonesia almirazp@student.uns.ac.id

#### Wahyudi Sutopo

University Centre of Excellence for Electrical Energy Storage Technology Research Group Industrial Engineering and Techno-Economic Industrial Engineering Department, Faculty of Engineering Universitas Sebelas Maret Surakarta, Indonesia wahyudisutopo@staff.uns.ac.id

### **Renny Rochani**

Industrial Engineering Department, Faculty of Engineering Universitas Sebelas Maret Surakarta, Indonesia rennyrochani@staff.uns.ac.id

#### Abstract

This study aims to measure the performance of Sritex through financial performance measurement methods using profitability analysis (Net Profit Margin, Return on Equity, and Return on Assets) to see a representation of the company's performance in recent years, but also accompanied by the actual condition of the company. Seen from several sources of articles on the internet to harmonize and conclude the company's performance so far. The output of this research is a formulation of a new business strategy that can be used to improve the company's performance to achieve above-average returns as well as strong competitiveness at the global level. Based on the calculation, it is known that the Net Profit Margin, Return on Asset and Return on Equity tend to decrease every year. Therefore, several new proposed strategies have been formulated. These include implementing a cost leadership strategy in the company's exports, diversifying its business and product differentiation. Cut production costs by building or acquiring subsidiaries to produce their own raw materials. And do mass production so that the logistics costs will be cut by itself.

### Keywords

Business Strategy, Performance Measurement, SWOT Analysis, Profitability Ratio Analysis, Textile Industry

#### **1. Introduction**

PT Sri Rejeki Isman Tbk. or commonly known as SiteX, is a textile company headquartered in Sukoharjo, Central Java. This company was founded by HM. Lukminto in 1966 as a textile trading business in Klewer Market, Solo under the name "UD Sri Redjeki". In 1968, UD Sri Redjeki opened its first printing factory to produce white and colored fabrics in Joyosuran, Solo. In 1978, UD Sri Redjeki was registered with the Ministry of Trade as a limited liability company named "PT Sri Rejeki Isman". Sritex was able to survive the Monetary Crisis in 1998 and managed to multiply its growth by 8 times. So that in 2013, PT Sri Rejeki Isman Tbk was officially registered its shares (with ticker code and SRIL) on the Indonesia Stock Exchange. Until now, for 54 years, Sritex is still one of the largest textile companies in Southeast Asia, which is still actively producing and exporting its products to various continents, especially Europe, Asia and America.

Sritex's vision is "To be the most innovative partner in providing the most quality products and services for the military, government and private institutions". Consumers of Sritex itself have been business consumers consisting of government and private institutions. The company's products are divided into four categories which include cotton, yarn, fabric, and clothing which are sold to textile manufacturers and retailers. 70% of production is exported abroad, 30% of which are military uniforms. Sritex has served military clothing equipment for more than 19 countries such as Germany, United Kingdom, Arab Emirates, Austria, Sweden, Netherlands, Norway, Greece, Oman, Kuwait, Suriname, Brunei Darussalam, Papua New Guinea, Philippines, Saudi Arabia, and Swaziland. So far, Sritex has tended to sell more for branded fashions. However, during the COVID-19 pandemic, textiles suffered a heavy blow because for branded products people tended to go to the mall rather than through online sites, while during the pandemic restrictions people were prohibited from doing many activities outside the home including shopping. Thus, the demand for branded products has decreased, and currently there is no positive sentiment that can encourage Sritex's performance.

Due to the continuing impact of the COVID-19 pandemic, in the third quarter of 2021 Sritex experienced a negative cash flow. This has an impact on the problem of payment of obligations to creditors. Judging from Sritex's financial report as of the end of December 2020, Sritex's ability to pay short-term debt is indeed worrying. However, based on the decision of the meeting on the Suspension of Debt Payment Obligations (PKPU) on January 21, 2022, at the Commercial Court, Semarang, PT Sri Rejeki Isman Tbk was released from bankruptcy after all of the company's creditors agreed to the reconciliation scheme offered by the company. In the decision, the majority of creditors agreed to the restructuring scheme proposed by the company.

The current global business strategy is needed to be able to compete globally in the industrial era 4.0. In designing a global strategy, a company must decide how to change or adopt a core business model to achieve above-average revenues when the company operates globally (Khofiyah et al., 2020). Business strategy is used to determine market share, long-term goals, and describe the bad things that will happen. The more businesses that appear, the more competitors there are so that more innovation is needed. During very tight business competition, the preparation of a business strategy must be carried out very carefully, in addition to boosting sales, the strategy is also important to face competitors.

The profit obtained by the company in the coming year cannot be ascertained, it is necessary to make a prediction of changes in profit, where profit is an indicator to determine the company's financial performance, whether it has increased or decreased. Changes in profit will affect the financial policy for further activities. Every company will carry out various business activities to achieve goals. The role of capital and assets is very important because they are needed in operational activities. The goal to be achieved by a company is to obtain maximum profit. However, large profits must be achieved with a healthy company's economic condition and high company efficiency. To measure the company's ability to generate profits in a certain period, profitability ratios can be used. The profitability ratios that will be used are Net Profit Margin (NPM), Return on Assets (ROA), and Return on Equity (ROE).

### 1.1 Objectives

The problem in this study is how to formulate a new business strategy by analyzing the financial statements as seen from the profitability ratio analysis using the Net Profit Margin, Return on Equity and Return On Assets method and then also using the company's internal and external analysis through SWOT analysis. The aim of this research is to formulate a business strategy for achieving global competitiveness and above-average return. The benefit of this research is to assist company management in evaluating company performance and formulating new business strategies to achieve above-average returns.

### 2. Literature Review

### 2.1 Global Strategy Concept

Many organizations and businesses have become global because of globalization in the international economy, which has used political, cultural, and economic pressures to foster an interdependent environment and advance towards a global system (Buckley and Ghauri 2004). A focus strategy finds market segments where the organization can successfully compete. The strategy is based on market features and a company's competitive advantage to select a market where a company's resources will most likely result in the targeted sales volume, revenue, and profit (Chronicle

2015). Global strategic management is the process of creating a coherent, coordinated, integrated, and integrated strategy that determines the extent to which a company's strategic behavior is globalized across countries by standardizing offerings, configuring, and coordinating activities, and integrating competitive movements (Frynas 2015). Companies can get some benefits from global strategies in a variety of ways, including economies of scale, global brand recognition, global customer satisfaction, lower labor costs and increased input costs, R&D costs and cost recovery in as many nations as feasible, and the creation of new markets (Lynch 2018).

#### **2.2 Performance Measurement**

Performance management is a means to evaluate and manage the overall activities of the organization. Organizations are encouraged to increase their performance levels, and to manage their staff as well as their customers more strictly to achieve better outputs and results (Yüksel & Coşkun, 2013).

The results of measuring the performance of an activity aim to determine the extent to which the organization has achieved its goals. Performance measurement is not just a data collection process, but rather a process to improve effectiveness and efficiency. Performance measurement is an important process for decision makers in all 9 types of organizations. However, simply measuring performance is not enough. Managers also have to make decisions and implement decisions based on performance results (Yüksel & Coşkun, 2013).

### 2.3 SWOT Analysis

SWOT is an evaluation of all the strengths, weaknesses, opportunities, and threats that exist in individuals and organizations (Namugenyi, 2019).

1. Strength

It is an organizational characteristic that provides benefits or added value for the company

2. Weakness

It is a characteristic that gives a loss or does not add value to the company

- 3. Opportunity Is a condition which is a picture of the opportunities that exist from the external side of the organization and this picture can provide opportunities for the development of a company in the future
- 4. Threat

Is a condition where there are several threats from a company that can cause a setback in the company.

### 2.4 Financial Report Analysis

Financial statement analysis is an analysis conducted to examine the relationship between accounting numbers and the trend of these numbers in a certain period. Financial statement analysis needs to be done to assess the company's past, present, and future financial condition, and results of operations. Financial statement analysis is also carried out to assess the company's financial strengths and weaknesses (Martani, 2018).

The purpose of financial statement analysis, among others, is as an initial screening tool in having alternative investments or mergers, as a forecasting tool regarding future financial performance conditions, as a diagnostic process for management problems, operations or other problems, and as an evaluation tool for management. (Prastowo, 2002).

### 2.5 Profitability Ratio Analysis

One of the ratios that can be used to assess financial performance is the profitability ratio. The profitability ratio is the net result of a series of policies and decisions that show the combined effect of liquidity, asset management, and debt on operating results. Profitability ratios reflect the results of financial policies and operational decisions, profitability ratios also describe the effectiveness and efficiency of the company in carrying out operational activities using all the capital owned so that it can generate profits that are used for the company's sustainability (Suhendro, 2018).

Net Profit Margin (NPM) is the ratio or comparison between the net profit that has been achieved with the level of sales. The higher the NPM ratio, it means the company is more efficient in carrying out its operations (Haryanti, 2015). Net Profit Margin (NPM) can be calculated by the following formula:

NPM = 
$$\frac{Net \ Income}{Sales} \ x \ 100\%$$

Return On Equity is an important ratio for shareholders to determine the effectiveness and efficiency of capital management carried out by the management. Because Return on Equity (ROE) shows the company's ability to generate profit after tax by using its own capital owned by the company (Niranjan et all, 2013). Return on Equity can be calculated by the following formula:

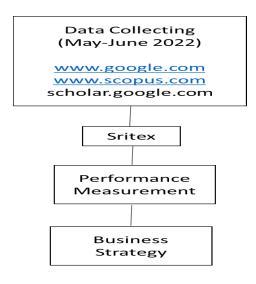
$$ROE = \frac{Net \ Income}{Equity} \ x \ 100\%$$

Return on Assets (ROA) shows the company's ability to use all assets owned by the company to generate after-tax profits. This ratio is important for management to evaluate the effectiveness and efficiency of company management in managing all company assets (Nuruwael, 2013). Return on Assets can be calculated by the following formula:

$$ROA = \frac{Net \ Income}{Total \ Assets} \ x \ 100\%$$

#### 3. Methods

The method used in this research is observation by collecting secondary data via the internet. In addition to observations via the internet, library research was also carried out by taking materials from reference books as a theoretical basis related to this research. After the secondary data and reference materials have been collected, the performance measurement using the profitability analysis method is carried out. After measuring the performance, the next step is to formulate a new strategy that can be applied to the company.



#### 4. Data Collection

The data needed is the annual financial report of PT Sri Rejeki Isman Tbk from 2018 to 2020. The data source is from the Indonesia Stock Exchange website (www.idx.co.id) and the official website of PT Sri Rejeki Isman Tbk (<u>www.sritex.co</u>). The data collection technique is done by browsing the internet and looking at the data available on the official websites. The data needed include data on annual net income, total assets, total equity, and total sales to be calculated according to the formula for each method. Then, the results of the calculation of each method will be analyzed to determine the results of the company's performance and based on the company's actual conditions as well as global conditions so that it can be concluded a new strategy for achieving goals. Data regarding the condition of the company and also global conditions that affect performance are obtained from sources of articles that can be justified through the internet, which are then analyzed and linked to the company's performance so far.

# 5. Results and Discussion

# 5.1 Internal and External Analysis

The following is a SWOT analysis that looks at the internal and external factors of PT Sri Rejeki Isman Tbk. There are strengths, weaknesses, opportunities, and threats that are owned and faced by the company. (Table 1)

	Strengths		Weaknesses
1.	Good corporate image	1.	The target market is not wide because so
2.	High quality products		far Sritex has mostly served business
3.	Domestic distribution is done alone		consumers such as hotels, restaurants,
4.	Empowering employees well		government, etc.
		2.	Marketing is only done through direct
			selling
	Opportunity		Threats
1.		1.	Threat of brankuptcy due to not being
	largest textile company in Southeast		able to pay debts to creditor
	Asia with huge market potential	2.	The number of bad debts because the
2.	Advanced machine technology		client is unable to pay the debt
		3.	The COVID-19 pandemic that
1			paralyzed the world economy

Table 1 SWOT Analysis

### **5.2 Financial Analysis**

Table 2	The	Calculation	Results

	2018	2019	2020
Net Profit Margin	8.18%	7.42%	6.65%
Return on Asset	6.20%	5.62%	4.61%
Return on Equity	16.38%	14.79%	12.69%

The following is the value of the profitability ratio of PT Sri Rejeki Isman Tbk which is represented by Net Profit Margin, Return on Assets, and Return on Equity. Based on the results of calculations obtained from the annual financial statements of PT Sri Rejeki Isman Tbk in 2018, 2019, and 2020, it can be seen that the Net Profit Margin obtained in 2018 was 8.18%, in 2019 there was a decrease of 0.76% to 7.42%. Then in 2020 there was a decline again by 0.77% to 6.65%. From 2018-2020 the Net Profit Margin at PT Sri Rejeki Isman Tbk tends to decrease every year; the highest Net Profit Margin value was obtained in 2018. The decline in the Net Profit Margin value from year to year shows the company's performance is not good, sales at the year has increased but the profit earned has decreased in 2020. The decline in profit in 2020 occurred amid an increase in the company's revenue but was hindered by large operating expenses due to an increase in selling expenses from US\$ 17.51 million to US\$ 19.93 million. The NPM results obtained are still very far below the industry average standard of 20%. (Table 2)

Table 3	Sales	and	Profit	Data
---------	-------	-----	--------	------

	2018	2019	2020
Sales (thousand USD)	1,033,946	1,181,834	1,282,569
Current Year Profit	84,556	87,653	85,325
(thousand USD)			

Based on the Table 3 of profitability ratio calculations above, it can be concluded that the Return on Assets of PT Sri Rejeki Isman Tbk in three consecutive years since 2018 has decreased. The Return on Assets obtained in 2018 was 6.20%, in 2019 there was a decrease of 0.58% to 5.62%. Then in 2020 there was a decline again by 1.01% to 4.61%.

The decline in the value of ROA from year to year indicates that the company's ability is not good enough to generate maximum net profit by using its assets productively. According to the Director of Avere Investama, Teguh Hidayat, Sritex's short-term assets are actually quite large, coming from its trade receivables. He considered that, at first glance, there was no problem with liquidity, but based on the 2020 financial report, the cash flow was negative, meaning that the income and net profit were not cash, they were still committed, causing receivables to increase. These problems began to arise since the COVID-19 pandemic hit the world economy, causing some customers to be late in paying their accounts receivable considering that fashion outlets had closed due to the lockdown. Based on the standard ROA value, a good ROA value must be above 5.98%, so the ROA value of PT Rejeki Isman Tbk in 2019 and 2020 is still below the standard or can be categorized as bad.

	2018	2019	2020
Total Asset (thousand USD)	1,364,272	1,559,252	1,851,989
Current Year Profit (thousand USD)	84,556	87,653	85,325

Table 4 Asset and Profit Da	ata
-----------------------------	-----

Return on Equity from PT Sri Rejeki Isman Tbk in three consecutive years has decreased from 2018 to 2020. It can be seen that the Return on Equity obtained in 2018 was 16.38%, in 2019 there was a decrease of 1.59% to 14.79%. Then in 2020 there was a decline again by 2.1% to 12.69%. The decrease in ROE value was due to the lack of efficiency in the performance of PT Sri Rejeki Isman Tbk in optimizing its own capital to generate net profit. This is due to limited working capital which is not able to support sales. The average ROE value of the industry is 40%, so the ROE value obtained by PT Sri Rejeki Isman Tbk is still very far below the standard. (Table 4 & 5)

Tuble 5 Equity and Tront Data			
	2018	2019	2020
Total Equity (thousand USD)	516,248	592,669	672,417
Current Year Profit	84,556	87,653	85,325

Table 5 Equity and Profit Data

Based on Sritex's financial report in the third quarter of 2021, the company recorded a net loss of USD 924.50 million while showing a decrease in revenue to assets as of September 30, 2021. Sritex had net sales which decreased by - 29.76% compared to the same period in 2020. In detail, the textile sector was still the mainstay of the company's sales of USD 400.23 million, consisting of sales of USD 225.66 million of yarn, USD 76.68 million of finished fabric sales, USD 85.37 million of apparel sales, and USD 12.51 million of raw fabric sales. Meanwhile, income in the domestic market earned a total of USD 236.88 million, including sales of USD 122.76 million of yarn, sales of USD 45.41 million of finished fabric, USD 40.15 million of apparel sales, and sales of USD 28.54 million of raw fabric.

### **5.2 Recommendations**

(thousand USD)

The strategy currently being carried out by Sritex is to maintain and improve operational performance by increasing market share and diversifying products. To adapt to market conditions during the COVID-19 pandemic, Sritex carried out various product diversification strategies such as selling PPE and masks as well as encouraging the birth of online marketing. Currently Sritex is also focusing on credit restructuring to homologation, so that there is already a bright spot for Sritex to raise the company's operational performance.

Export sales are still Sritex's main focus in line with plans to strengthen exports to the United States. However, exports themselves have some disadvantages, which include high transportation costs and high tariffs imposed on some incoming goods. And also have to pay distributors or allow distributors to increase prices to cover costs and earn profits. Quoted from the book "Strategic Management" by Michael A. Hitt, it is said that evidence shows that cost leadership strategies improve export performance in developed countries, while differentiation strategies are more successful in developing countries. Since Sritex's current focus is exports to developed countries, the cost leadership strategy is the most appropriate strategy. Porter (1980) defines cost leadership as the achievement of "overall cost leadership in an industry through a set of functional policies aimed at this basic objective. Cost leadership requires aggressive construction of efficient-scale facilities, vigorous pursuit of cost reductions from experience, tight cost and

overhead control, avoidance of marginal customer accounts, and cost minimization in areas like R&D, service, sales force, advertising, and so on,".

The following are some of the ways that can be used to achieve an optimal cost leadership strategy, utilize company resources effectively to avoid waste, carry out mass production to achieve economies of scale that result in lower unit costs, and invest in renewable technologies to achieve smart work. Sritex in 2021 won the industry 4.0 Readiness Index (INDI 4.0) award from the Ministry of Industry for the Product and Service category. Sritex makes updates in various aspects of production, starting from the coloring design that already uses digital print, the weaving system used in the factory is a robotic system, namely a programmable logic controller that uses algorithms. This can be a good first step for Sritex to implement a smart work system to increase productivity. Besides that, it must also be accompanied by a strong R&D team to continue to create new product innovations using available resources.

Strategies that can be done include diversifying the business so that sales do not depend on one particular area, and also focusing on more profitable markets. Apart from that, it can also differentiate products, so far Sritex is known to produce innovative products with low and affordable prices. To cut costs so that product prices can be competitive, among others, is to cut costs on procurement of goods, because 60% of Sritex's raw materials are imported goods such as cotton, rayon fiber materials, and polyester. However, in the past few years Sritex has started to build its own rayon factory to produce yarn raw materials. With the existence of its own rayon factory, it can cut production costs and also reduce differences in the quality of rayon fiber for production needs, so that product quality is maintained. In addition, by producing various types of fabrics that are needed by consumers, Sritex can also automatically reduce logistics costs, because whatever the consumers want is already available by Sritex.

#### 6. Conclusion

Profitability ratio analysis is one of the ratios that can be used to assess financial performance which can describe the effectiveness and efficiency of the company in carrying out operational activities. Some ratios that can be used are Net Profit Margin, Return on Equity and Return on Assets. In addition, the company's performance can also be analyzed using a SWOT analysis by looking at the strengths, weaknesses, opportunities, and threats faced by the company. After analyzing the company's performance, a new strategy is formulated that the company can do. These include implementing a cost leadership strategy in the company's exports, diversifying its business and also product differentiation. Cut production costs by building or acquiring subsidiaries to produce their own raw materials. And also do mass production so that the logistics costs will be cut by itself.

### Acknowledgments:

This research was funded by the Institution of Research and Community Services, Universitas Sebelas Maret, through the program "**Penelitian Hibah Grup Riset**", grant number 254/UN27.22/PT.01.03/2022.

### References

Buckley, P. J., & Ghauri, P. N., Globalization, economic geography, and the strategy of multinational enterprises, *Journal of International Business Studies*, vol.35, no. 2, pp. 81–98, 2004.

Frynas, Jedrzej George, and Kamel Mellahi, Global strategic management, *Oxford University Press*, USA, 2015. Hanafi, M. M., & Halim, A. Analisis laporan keuangan. Edisi revisi. Yogyakarta: UPP AMP YKPN, 101. (2003). Harahap. S. Safri. Analisis Kritis Atas Laporan Keuangan. Edisi 1, Cetakan 10, Jakarta: Bumi Aksara. 2011.

Haryanti, C. S. Analisis Perbandingan Laporan Keuangan Untuk Menilai Kinerja Keuangan Pada Perusahaan Telekomunikasi ( Studi Kasus BEI ). *Jurnal Ilmiah UNTAG Semarang*, 2(2), 52–86. (2015).

Hitt, M. A., Ireland, R. D., & Hoskisson, R. E. Strategic management: Competitiveness and globalization: concepts and cases. Cincinnati, Ohio: South-Western College Pub. (1999).

Indonesia Stock Exchange, https://www.idx.co.id/perusahaan-tercatat/laporan-keuangan-dan-tahunan/. Accessed May 20, 2022.

Khofiyah, N. A., Sutopo, W., & Ardiansyah, R. Global business strategy for commercializing a technology of drone: A lesson learned from dji drones and parrot drones. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, August 1014–1025. (2020).

Lynch, R., Strategic Management 8th New edition, London: Pearson Education, ISBN: 978-1292211404, 2018.

Namugenyi, C. ScienceDirect ScienceDirect Design of a SWOT Analysis Model and its Evaluation in Diverse Design of a SWOT Analysis Model and its Evaluation in Diverse Digital Business Ecosystem Contexts Digital Business Ecosystem Contexts. Proceedia Computer Science, 159, 1145–1154. (2019).

- Niranjan Banik, Adam Koesoemadinata, Charles Wagner, Charles Inyang, H. B. No Title Стационарная медицинская помощь (основы организации). pp. 295–305. (2013).
- Nuruwael, G. M. Analisis Rasio Keuangan Sebagai Alat Untuk Menilai Kinerja Keuangan PT. International Nickel Corporation Tbk. *Ilmu Dan Rise*, 2(1), pp. 1–15. (2013).
- Suhendro, D. Analisis Penilaian Kinerja Keuangan Perusahaan Menggunakan Rasio Keuangan Pada PT Unilever Indonesia Tbk Yang Terdaftar Di Bursa Efek Indonesia (BEI). AT-TAWASSUTH: Jurnal Ekonomi Islam, 3(1), 23. (2018).
- Yüksel, H., & Coşkun, A. (2013). Strategy Focused Schools: An Implementation of the Balanced Scorecard in Provision of Educational Services. Procedia - Social and Behavioral Sciences, pp. 106, 2450–2459.

Sritex, https://www.sritex.co.id/id/laporan-keuangan/. Accessed May 20, 2020.

# **Biographies**

Almira Zana Pratama is currently a student at Master Program of Industrial Engineering Department, Sebelas Maret University, Surakarta, Indonesia. She received her Bachelor of Engineering degree from Telkom University in 2020. Her research interests are in supply chain management, logistics and techno-economics, micro-business management and business strategic management.

Wahyudi Sutopo is a professor in industrial engineering and Head of Industrial Engineering and Techno-Economics Research Group, Department of Industrial Engineering, Universitas Sebelas Maret (UNS), Surakarta, Indonesia. He is also a researcher for the center of excellence for electrical energy storage technology (CoE-EEST), the president of the industrial engineering and operations management (IEOM) society for Indonesia's professional chapter, and the Director of IEOM Asia Pacific Operation. His educational background is the profession of an engineer from UNS (2018); a doctor and bachelor's in industrial engineering from Institut Teknologi Bandung (2011 & 1999); and a Master of Management Science from Universitas Indonesia (2004). His research interests include supply chain engineering, engineering economy & cost analysis, and technology innovation & commercialization. Dr. Sutopo has completed research projects with more than 45 grants and carried out research projects funded by the Institution of Research and Community Services - UNS, Ministry of Research and Technology / National Agency for Research and Technology, Indonesia Endowment Fund for Educational (LPDP), PT Pertamina (Persero), PT Toyota Motor Manufacturing Indonesia, and various other companies. He has written four textbooks, seven-chapter books and made five intellectuals property rights (IPR) in the form of copyrights and three patents. He has initiated commercializing research outputs of UCE-EEST UNS related to energy storage technology and electric vehicle conversion through start-ups where he is one of the founders, namely PT Batex Energi Mandiri and PT. Ekolektrik Konversi Mandiri. Dr. Sutopo has published articles on over 185 documents indexed by Scopus with H-index 12. His email address is wahyudisutopo@staff.uns.ac.id.

**Renny Rochani** is a lecture in Industrial Engineering Faculty at Universitas Sebelas Maret-Surakarta, Indonesia. She is also in the Research Group Industrial Engineering and Techno-Economic Industrial Engineering Department, Faculty of Engineering Universitas Sebelas Maret Surakarta, Indonesia. Her recent research is to develop a mobile battery swap charging station for electric motorcycles in Indonesia.