

Strategic Development for A Filter Automotive Component Company in Facing the Electric Vehicles Era in Indonesia

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Abstract

Many countries have supported the development of sustainable technology in the automotive sector by making innovations for Electric Vehicles (EV). Indonesia is one of the countries that supports this program. With this program, it is estimated that 30% of automotive component suppliers in Indonesia will disappear because EVs have fewer components than current conventional vehicles. The filter is one of the automotive components that are directly related to the Internal Combustion Engine (ICE) for conventional vehicles. By conducting a case study approach to a filter manufacturer and formulating the IE matrix. The result shows that threats regarding government regulations for electric cars can be overcome by other policies regarding biofuels that still use filters in the engine combustion process because natural resources from its country, economic condition, and growth rate in Indonesia also are good opportunities for the external factors. The company's internal capabilities greatly affect the company's readiness. Marketing, financial, and research and development aspects have a strong correlation with the company's strategy in facing the electric vehicles era in the future, therefore the choices for this company are quietly much those are integration strategy, market penetration, market development, and product development.

Keywords

Filter, Electric Vehicle, Strategic Development

1. Introduction

Greenhouse gas emissions from the internal combustion engine are one of the current problems for the environment. Internal combustion engine (ICE) which operates on fossil fuel oil provides about 25 % of global power (around 3000 of the equivalent of 13,000 million tonnes of oil per year), which has an impact of around 10% of global greenhouse gas (GHG) emissions (Reitz et al., 2019). Besides, the amount of annual petroleum resources that can support oil supply depends entirely on the discovery of new oil reserves and the cumulative oil production (as well as the cumulative oil consumption) (Ehsani, Gao, Longo, & Ebrahimi, 2018). One of the solutions to these two issues is to develop an electric vehicle. Many countries have supported the development of sustainable technology in the automotive sector by making innovations regarding this electric vehicle (EV).

Many countries around the world have also started to appeal and make policies regarding electric vehicles that encourage the public will be interested in using these vehicles, the evidence this issue is the sales of these environmentally-friendly vehicles always increase every year, where the domination of the top three sales of electric vehicles is in China, America, and Europe, and by 2020 the sales of electric vehicles have reached more than two million units worldwide (IEA, 2020). This is inseparable from the decline in the price of electric vehicle components (especially batteries) each year (Pevce, Babic, & Podobnic, 2019) which makes the price of electric vehicles will be the same with internal combustion engine vehicles in the future, therefore many researchers estimate the dominance of electric vehicles throughout the world will happen soon depend on the government regulations.

Responding to this change, researchers have conducted studies on the strategy for automotive companies in facing this transition. The suitable method for this analysis was by using the morphological method/approach based on a segment of topics and give the result that it is important to make business models for various stakeholders (Kley,

Lerch, & Dallinger, 2011), of course, this is true because there are many sectors in the automotive industry. , and this research shows that each type of topic will have a different strategy. This has a consistent result in truck manufacturing research in Sweden said to create a viable business model for facing technological shifts that require a combination of technology and service innovation (Tongur & Engwall, 2014). The other research of the strategy in Europe stated it is better to reduce costs and risk, and the European OEMs delegate to other companies to the significant portions of the value manufacture, namely component suppliers and system integrators (Dicken, 2015). Christensen B et al. (2012) says, innovative technology can realize with a change in the business model, therefore the new technology becomes commercially viable. Then, in a different study in Germany for an incumbent company, with its advantages over this position, three general strategies can be applied, namely "exit", "switch" and "sailing effect" (SSE) (Song & Aaldering, 2019). An upgrade strategy was also carried out for automotive supply companies from the forging and casting industry in Germany and found a finding that the existing supplier-buyer relationship pattern can provide a value chain strategic option that is more attractive than the diversification sector (Schwabe, 2020).

Indonesia also one of the countries that support sustainable technology in the automotive sector by the issue of new policies. The President of Indonesia made a Presidential Regulation (Perpres 55/2019) on August 8, 2019, for improving energy efficiency, security, and energy conservation in the transportation sector, and realizing clean energy, clean air quality, and environmentally friendly, as well as Indonesia's commitment to reduce greenhouse gas emissions, which needs to encourage battery-based electric motor vehicle acceleration programs (battery electric vehicles for road transportation). With the Acceleration of the Battery-based Electric Motor Vehicles Program, there will be many impacts for the Automotive Industry players. There are also several studies regarding development strategy for an automotive component that has conducted in Indonesia, From the internal factor said the manufacturing capabilities is one of the aspects that should be considered to the company to achieve the sustainability strategy performance in the automotive company (Herbanu & Nurcahyo, 2018), This research is supported by the statement that called aspects for the automotive component strategy will get by influencing the functional capability of the company (Nurcahyo et al., 2019), but after issuing presidential regulation 55/2019 and considering the conditions that exist in Indonesia, external factor from this new regulation and conditions must be included in facing the EV era.

There will be many impacts due to the enactment of Presidential Regulation 55/2019, especially automotive component business actors who have long contributed to Indonesia. According to the Secretary-General of the Association of Automobile and Motorcycle Tool Industries (GIAMM), said that battery-based electric vehicles do not require many components, so it is estimated that a third or 30% of the automotive component companies in the industry will disappear. Ministry of industry (Kemenperin) noted that 10 thousand conventional vehicle components will disappear along with the presence of pure electric vehicles in the country. Electric vehicles only need to be supported by around 20 thousand components, while conventional vehicles are supported by 30 thousand components (CNN,2019). This research can be useful to know and fill the gaps in previous research related to the strategy in facing the EV era in Indonesia especially for the filter company which is estimated will lose its existence.

1.1 Objectives

The filter is one of the automotive components that are directly related to ICE, and with the presence of electric vehicles, there is no need for a fuel filter, an air filter, and oil filter, and only one filter is left that is a cabin air filter. This research will conduct in a filter component company that produces various types of filters, both local and export. Presidential Regulation 55/2019 will have an impact to filter company regarding the "estimation" that 30% of the automotive component companies will disappear.

By knowing the background and problems, this study has several objectives, namely:

- a. Contribute to filter automotive component company to determine the new strategies in facing the electric vehicles era.
- b. Provide an overview for the automotive component industry players in Indonesia regarding new strategies and options to keep seizing the opportunities in the future.

2. Literature Review

This section explains aspects from external factors and internal factors that may possible become the opportunities, threats, strengths, and weaknesses for the company. The aspects identified by data from the Central Bureau of Statistics and internal data from the company based on field study data and interviews.

2.1 External Factors Evaluation

Evaluation of external factors within the company can be identified based on Politics, Economics, Sociocultural, and Technology (PEST) Macmillan, H., & Tampoe, M. (2000).

a. Changing politics may be expected to cover a wide range of issues, for example, general changes in the political climate, changes in government, shifts in world powers, and specific laws and regulations.

Automotive is 1 of 5 Main Sectors that have been Chosen as a focus sector that is being promoted by Indonesia, can be an opportunity for filter manufacturer to face the electric vehicle in Indonesia. But the new regulation of electric vehicles can be the threats for filter manufacturer such as Providing incentives (lowering prices) from the government when using electric vehicles and The policy regarding Sales Tax on Luxury Goods (PPnBM), the imposition of taxes will be based on the exhaust emissions produced by the vehicle. This will be a benefit for green technology vehicles, especially pure electric vehicles (PEV).

b. Economic factors have a direct impact on the potential attractiveness of various strategies. For example, when interest rates rise, the funds needed for capital expansion become more expensive or unavailable.

Indonesia indicated well in economic aspect. The value of Indonesia's Gross Domestic Product (GDP) is categorized as very good at 5% compared to the world average of only 2.7%, but A stronger dollar and rising inflation reduce consumer interest in buying products and services.

c. Sociocultural encompasses social, cultural, demographic, and environmental changes that can have a major impact on all products, services, markets, and customers.

A population growth rate of 1.01% per year will increase market potential and superior resources for the company. But in fact, The average consumption activity of the Indonesian people decreases by 1.3% annually.

d. Technology can change product innovation, knowledge, distribution channels, and work processes in an external scope that can become opportunities or threats.

Eventhough there will be some threats for regulation of electric vehicles, but government support for technology development. Biofuel and gas vehicles from 2015-2035 require a filter to filter contaminants from biofuel and gas engines and Information technology that is increasingly advanced makes it easier to find various sources of information about electric vehicles and the development of filters in the world can be a big opportunities for filter manufacturer.

The new issue aobut electric vehicles technology is the decline in battery prices in the last 10 years has an average of 34%, causing in 2040 there will be a balance in prices between electric vehicles and conventional vehicles can be a threat for the vehicles that use the internal combustion engine as the powertrain.

2.2 Internal Factors Evaluation

All organizations have strengths and weaknesses in the functional areas of business. No company is equally strong or weak in all areas. Internal strengths/weaknesses, coupled with external opportunities/threats and a clear mission statement, provide the basis for setting goals and strategies. Five key factors are evaluating the company's internal factors, namely company management, marketing, finance/accounting, production/operations, research and development (R&D), and information system operations management (David, 2015).

a. The management function consists of five basic activities: planning, organizing, motivating, staffing, and controlling. In this company, management implements a formal corporate reporting structure and formal planning,

control, and coordination system and is evaluated regularly but the distribution of awards, positions, bonuses, and salaries for each employee has not been proper.

b. Marketing can be described as the process of defining, anticipating, creating, and fulfilling customer needs and desires for products and services. The company has a reputation with customers, brand names, and good quality by having many customers with any type of filters and good brand names make the company still the best filter manufacturer in Indonesia. But, its ability to has many variances of filters makes the lack of good interactions and relationships that are efficient, effective, supportive, and mutually beneficial due to backorders and claims.

c. Finance is often considered the best measure of a company's competitive position and overall attractiveness to investors. Determining the financial strengths and weaknesses of the organization is important for formulating strategies effectively. The financial / accounting function consists of three decisions: investment decisions, funding decisions, and dividend decisions (Fredrikson et al., 1969). Based on the annual report of this company, the financial capacity of the company's loans and the company's ability to generate internal funds are very good.

d. The production/business operation function deals with inputs, transformations, and outputs that vary between industries and markets. Roger Schroeder suggests that production/operations management consists of five functions or decision areas: process, capacity, inventory, labor, and quality. The company has semi-automated production/manufacturing technology with the use of a lot of manpower and insufficient access to raw materials (imports) causes delays in the production process are the weaknesses of the company.

e. Research and development has become broad-based, including supporting existing businesses, helping to launch new businesses, developing new products, improving product quality, increasing production efficiency, and deepening or expanding the company's technological capabilities. A well-equipped and internationally accredited filter testing laboratory provides enhanced ideas and scientific capabilities to meet customer demands.

f. Information ties all business functions together and provides the basis for all managerial decisions. Assessing the company's internal strengths and weaknesses in information systems is a critical dimension in conducting an internal audit. The use of end-to-end ERP (Enterprise Resource Planning) can improve company performance to get correct and accurate information.

2.3 Alternative Strategies

The strategy is the invention of a special and precious position implicating a distinct set of activities. Strategy implicates making "suitable" for a company's activities (Porter, 1996). The strategy is about creating a series of decisions that control corporate action under specific coupling with the company's condition and context (Zeleny, 2012).

The strategy formulation aims to determine the alternative strategy for the filter company in this research. First of all, identify the factors external and internal by getting the information is really necessary, the information input is needed to be able to formulate strategies. EFE and IFE are the tools for formulating the strategy.

According to David (2015), there are four Alternative Strategies (Integration Strategy, Intensive Strategy, Diversification Strategy, and Defensive Strategy) and can be applied under certain conditions, usually, organizations implement a combination of two or more strategies, but a combination strategy can be exceptionally risky if carried too far.

a. Integration Strategy is a strategy carried out by a company to get more control over distributors, suppliers, and competitors either through mergers, acquisitions, or creating their own company (David, 2015). There are three types of Integration Strategy namely forward integration, backward integration, and horizontal integration.

b. Intensive Strategy is a strategy implemented to increase sales by improving or modifying existing products. Implementing this strategy means that it involves huge research and development costs. Three types of strategy are market penetration, market development, and product development.

c. Diversification Strategy is one of the alternative strategies according to David (2015). There are two general types of diversification strategies: related and unrelated. Businesses are said to be related when their value chains possess

competitively valuable cross-business strategic fits; businesses are said to be unrelated when their value chains are so dissimilar that no competitively valuable cross-business relationships exist.

d. Defensive Strategy is the strategy that will maintain its current position or because of the limited conditions, the company must survive. There are three general types of Defensive Strategy: Retrenchment, Divestiture, Liquidation.

After collecting the data for internal and external factors from the filter company, IE matrix can help to develop a new strategy for the filter company by matching the values of the internal and external factors. The IE Matrix can be divided into three major regions that have different strategy implications (David, 2015). First, the sections that are placed into cells I, II, or IV can be described as grow and build. Intensive or integrative strategies can be the most suitable for these sections. Second, sections that are placed into cells III, V, or VII can be arranged to withhold and maintain strategies; market penetration and product development are two common strategies for these types of divisions. Third, a common prescription for divisions that fall into cells VI, VIII, or IX is harvest or divest.

3. Methods

This research aims to determine the new strategies and options to keep seizing the opportunities in the future for filter automotive component company in facing the era of electric vehicles. The method that used in this research is by using the case study approach in Filter manufacturer that produce types of automotive filters namely oil filter, fuel filter, air filter, and cabin air filter and formulate the EFE IFE Matrix by computing the weight scores for determining the alternative strategies and options to filter the automotive component company, and then evaluate the results by matching values with IE matrix. Identification of the external factors based on PEST (Political, Economic, Sociocultural, and Technology) and for internal factors identification based on Management, Marketing, Finance and Accounting, Research and Development, Production, and Information System aspects.

Data collection will conduct by giving the questionnaire to 30 respondents that have experience in the filter manufacturer industry. The method that used in this research is calculating EFE and IFE based on equation no 3.1-3.6 by getting the answers for 30 respondents. The last step is to conduct the correlation and validation test in equation no 3.7 to ensure the statement for EFE and IFE are valid statements.

$$\text{Weight} = \frac{\text{Statement weight score}}{\Sigma \text{The total weight score}} \dots\dots\dots (3.1)$$

$$\text{Rating} = \frac{\text{Total rating score}}{\text{Number of respondents}} \dots\dots\dots (3.2)$$

$$\text{Score}_{(\text{opportunities})} = \text{weight (On)} \times \text{rating (On)} \dots\dots\dots (3.3)$$

$$\text{Score}_{(\text{Threats})} = \text{weight (Tn)} \times \text{rating (Tn)} \dots\dots\dots (3.4)$$

$$\text{Score}_{(\text{Strengths})} = \text{weight (Sn)} \times \text{rating (Sn)} \dots\dots\dots (3.5)$$

$$\text{Score}_{(\text{Weaknesses})} = \text{weight (Wn)} \times \text{rating (Wn)} \dots\dots\dots (3.6)$$

$$r_{xy} = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{N\Sigma x^2 - (\Sigma x)^2(N\Sigma y^2 - (\Sigma y)^2)}} \dots\dots\dots (3.7)$$

r_{xy} = The correlation coefficient between the variable x and the variable y

Σxy = The sum of times the variables x and y

Σx^2 = The sum of the squares of the x – value

Σy^2 = The sum of the squares of the y – value

$(\Sigma x)^2$ = The sum of the x values, then squared

$(\Sigma y)^2$ = The sum of the y values, then squared

In the end, this study will provide a conclusion to provide an improvement regarding the development of the filter automotive component's strategy in Indonesia in facing the era of electric vehicles. The last is suggestion will be given as input for further research.

4. Data Collection

In this research, based on the identification of external factors and internal factors from 30 respondents, the results obtained are formulated into EFE and IFE formulation in equations no 3.1-3.7. Table 4.1 and Table 4.2 describe external and internal factors regarding this research.

Table 4.1 External factors evaluation matrix for filter manufacturer

Factor	Code	Statement Item	Weight	Rating	Score	Corellation of Weight	Corellation of Rating
Opportunities	O1	Automotive is 1 of 5 Main Sectors that have been Chosen as a focus sector that is being promoted by Indonesia	0.099	3.000	0.296	0.335	0.394
	O2	The value of Indonesia's Gross Domestic Product (GDP) is categorized as very good at 5% compared to the world average of only 2.7%	0.097	2.233	0.216	0.600	0.415
	O3	The population growth rate of 1.01% per year will increase market potential and superior resources for the company	0.093	2.567	0.238	0.404	0.490
	O4	Government support for technology development. Biofuel and gas vehicles from 2015-2035 require a filter to filter contaminants from biofuel and gas engines	0.107	3.300	0.353	0.491	0.631
	O5	Increasingly advanced information technology makes it easier to find various sources of information about electric vehicles and the development of filters in the world	0.115	3.667	0.422	0.386	0.498
Threats	T1	Providing incentives (lowering prices) from the government when using electric vehicles	0.101	3.167	0.319	0.777	0.595
	T2	The policy regarding Sales Tax on Luxury Goods (PPnBM), the imposition of taxes will be based on the exhaust emissions produced by the vehicle. This will be a benefit for green technology vehicles, especially pure electric vehicles (PEV)	0.100	3.067	0.306	0.722	0.431

	T3	A stronger dollar and rising inflation reduce consumer interest in buying products and services	0.100	3.067	0.306	0.528	0.475
	T4	The average consumption activity of the Indonesian people decreases by 1.3% annually	0.088	2.400	0.210	0.306	0.403
	T5	Technology regarding the decline in battery prices in the last 10 years has an average of 34%, causing in 2040 there will be a balance in prices between electric vehicles and conventional vehicles	0.102	2.700	0.275	0.408	0.400
Total Score			1		2,941		

Table 4.2 Internal factors evaluation matrix for filter manufacturer

Factor	Code	Statement Item	Weight	Rating	Score	Corellation of Weight	Corellation of Rating
Strengths	S1	Management implements a formal corporate reporting structure and formal planning, control, and coordination system and is evaluated regularly	0.101	3.333	0.338	0.461	0.566
	S2	The company has a reputation with customers, brand names, and good quality by having many customers	0.110	3.533	0.390	0.373	0.391
	S3	The financial capacity of the company's loans and the company's ability to generate internal funds are very good	0.101	3.267	0.331	0.684	0.519
	S4	A well-equipped and internationally accredited filter testing laboratory provides enhanced ideas and scientific capabilities to meet customer demands	0.106	3.400	0.362	0.375	0.469
	S5	The use of end to end ERP (Enterprise Resource Planning) can improve company performance to get correct and accurate information	0.097	2.933	0.286	0.340	0.376
Weaknesses	W1	The distribution of awards, positions, bonuses, and salaries for each employee has not been proper	0.096	2.733	0.264	0.593	0.669

W2	The lack of good interactions and relationships that are efficient, effective, supportive, and mutually beneficial due to backorders and claims	0.095	2.933	0.280	0.508	0.464
W3	The company has semi-automated production/manufacturing technology with the use of a lot of man power	0.090	2.200	0.199	0.320	0.402
W4	Insufficient access to raw materials (imports) causes delays in the production process	0.096	2.600	0.251	0.456	0.566
W5	The ability to innovate is lacking due to the absence of a pure Research and Development (RnD) division	0.104	3.167	0.331	0.693	0.575
Total Score		1		3.030		

5. Conclusion

After getting the scores from the analysis based on the External and Internal Factors, then the next step is conducting the guidance based on the IE (Internal External) matrix from the weight of values obtained to determine which quadrant of the IE value weight is. The IFE total weighted score indicated 2.941 points and the EFE weighted score indicated 3.03 point, which means the filter company can be described in a build and grow area, therefore the choices for this company is quietly much those are Backward, Forward, or Horizontal Integration, Market Penetration, Market Development, and Product Development.

Based on a survey conducted, threats regarding government regulations regarding electric cars can be overcome by other policies regarding biofuels that still use filters in the engine combustion process. Apart from that the strength on Indonesia's GDP as well as the growth rate also affects the upcoming external factors for the company. 2 invalid statements in this study regarding the selection of the automotive sector and the decrease in consumption activity do not correlate with opportunities or external threats for the company.

On the internal side, the company's internal capabilities greatly affect the company's readiness to face the era of electric vehicles. Marketing, financial, and research and development aspects have a strong correlation with the company's strategy in facing the era of electric vehicles in the future, and aspects of production and information systems do not have a strong correlation with the development of this strategy.

Future studies can explore the new finding for automotive component manufacturers based on ICE on a growing or medium scale. It is interesting to explore how medium companies can develop strategies to survive in facing the electric vehicles era in the future.

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