

Scenario Planning For Ceramic Tile Manufacturing Company PT. ABC

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Abstract.

Every Company requires a strategy to develop in the long term, upholding its position in the market with increasing sales volume, and profitability that ensures the sustainability of the Company itself. Mapping the path for the Company's future is a challenge in the strategy formulation, specifically in the face of disruptions which often occur both internally and externally. PT ABC's strategy must consider or prepare for all reasonable future possibilities to maintain the continuity of its business. The scenario planning approach prepared as part of PT ABC's strategy formulation will minimize the strategy implementation failure risk and provide a comprehensive picture of when to replace, change, or adjust the strategy through the early warning system, which monitors the company's external environment. The purpose of this study is to formulate a scenario planning by analyzing and investigating the driving forces, the critical uncertainties that arise and influence PT ABC's ceramic tile business, along with devising early warning signals so that PT ABC becomes able to determine which possible scenarios to use and what actions must be taken to deal with those scenarios. This study uses qualitative research methodology using primary and secondary data to determine the driving forces that will affect PT ABC's ceramic tile business until 2030. The obtained data is analyzed using the scenario planning approach, PESTEL analysis, and Porter's Five Forces analysis (Industry analysis) to create a scenario matrix that reflects critical uncertainties that will influence PT ABC's business in the future. The scenarios indicate possible future situations and offer strategic options for the company to manage the implications of each scenario. The 4 scenario planning were obtained, namely Civil War, Infinity War, End Game, and New Horizon, from the 2 most critical uncertainties, Gas Prices and Rupiah Exchange Rate. Before a scenario occurs, the company must determine the early warning signal to alert the company to which scenario will occur and what action should be taken. By establishing a comprehensive scenario planning, the company can develop strategies to help it confidently envision its future business.

Keywords: Scenario planning; critical uncertainties, driving forces and early warning signals.

I. INTRODUCTION

PT ABC is the largest ceramic tile manufacturing company in Indonesia. PT ABC's capacity and utilization are highly determined by the business strategy and conditions that will affect the strategy. Currently, the conditions of globalization have made the world interconnected. New technologies and free trade between major economic zones have increased global growth and prosperity, but have also made management and operations more complex for organizations [8]. This complexity, combined with increased volatility in the industrial environment and the general environment, adds to the uncertainty in the business world. This creates new challenges for management and strategic decision-making, as future developments today are less predictable than in the past [8][1]. Therefore, a company strategy is needed that can and is ready to face the VUCA (*Volatility, Uncertainty, Complexity, Ambiguity*) business world. A company's strategy is a series of coordinated actions that its managers take to outperform the company's competitors and achieve superior profitability [11]. The goal of a well-crafted strategy is not just temporary competitive success and short-term profits, but rather long-term success that can support growth and secure the company's future in the long term [11][12]. Strategies that have a long-term will face uncertainty, where the definition of uncertainty is as a possible non-quantified variance of the default *view of the future* or called ambiguity [6].

A tool is needed to arm these strategies in the face of an uncertain future. Scenario planning is the only tool in arming strategies to face the future, scenarios can be defined as a coherent and consistent series of events and actions set against a specific background or environment [6]. The current condition of the ceramic tile business in Indonesia is there is fierce competition between local manufacturers. In 2021,

there were 45 local ceramic tile manufacturers with an installed capacity of 551 million m²/year and with an utilization rate of 74.4% or 410 million m²/year (Asaki, 2022). In addition to competition between local manufacturers, it is also affected by the import of ceramic tiles, Table 1. Imports of ceramic tiles are influenced by volatile and uncertain container prices (container freight rate index), considering global political and economic conditions. Imported ceramic tiles take 20% of the market share of local manufacturing. The growth of ceramic tile consumption in Indonesia from 2013-2021 CAGR is 3.2%, while the growth of local manufacturing output is CAGR 0.6%, import growth is CAGR of 10.0% [2][3]; import growth (10.0%) is quite suppressing the growth of local manufacturing output (0.6%) in meeting the consumption of local ceramic tiles. This fierce and complex competition (between local companies and imports due to the impact of globalization) will force the ceramic tile manufacturing industry in Indonesia to plan long-term strategies to deal with uncertainty. And tools are needed to arm these strategies in the face of an uncertain future, the only such tool is scenario planning [6].

Table 1. Ceramic Tile Business in Indonesia, million m²/year

Indonesia	2017	2018	2019	2020	2021
Manufaktur	307	383	347	304	410
Ekspor	35	10	6	20	17
Impor	64	77	72	73	85
Konsumsi	336	450	413	357	478

Source: Modified Ceramic World Review 148, 2022:40, 42, 44, 46[2][3]

The following research aims to formulate the preparation of scenario planning, early warning signals from the emergence of each scenario, implications and options of each scenario [5] on the sustainability of PT. ABC.

II. METHODS

The research method uses qualitative research methods, research that involves the analysis of data or information that is originally descriptive and cannot be directly quantified [9]. This study takes data/interviews based on organizational group units, where data from individuals from each group are included in the group analysis unit [9]. In this study, the involvement of researchers was minimal, with a method of data collection through written interviews. In this study, the PESTEL concept analysis tool and *Porter's five forces* were used, with the concept of the external environment [5][7] that affects the ceramic tile industry in Indonesia, where PT ABC operates (PESTEL) and the forces working in the ceramic tile industry in Indonesia (*Porter's five forces*). The concept, operational variables, and interview questions can be seen in Table 2.

Table 1. Operational Variables

Tools	Concept	Variables	Interview Questions
PESTEL	The external environment of the company is all the factors that affect the company's profit potential and maintain a competitive advantage. To examine these factors, an analysis of the PESTEL model will be carried out. The results of the analysis can be used by leaders to mitigate threats and capitalize on company opportunities. (Rothaermel, 2017)	Political Factor	In the political field, what are the things that can influence/become a business/sales consideration in the next 5 years? (Examples of the implementation of the Regional Elections/Presidential Elections, Government Stability, Government Policies related to Construction/Property, Energy Policy and Energy Prices) [10].
		Economics Factor	In the field of economics, what are the things that can affect / become a business/sales consideration in the next 5 years? (e.g. rupiah exchange rate, economic growth, people's purchasing power, inflation rate, or GDP) [10].
		Socialculture Factor	In the sociocultural field, what are the things that can influence/become a business/sales consideration in the next 5 years? (examples of consumer readiness to accept new products, consumer shopping behavior, lifestyle and demographics) [10].
		Technology Factor	In the field of technology, what are the things that can influence/become a business/sales consideration in the next 5

			years? (example of cloud computing / <i>cloud computing</i> , internet and AI, industry 4.0, or 3D printing for marketing purposes) [10].
		Environment Factor	In the environmental field, what are the things that can affect / become a business/sales consideration in the next 5 years? (e.g., mining raw materials, environmentally friendly products, <i>life cycle assessment</i> , hygiene, or pollution) [10].
		Law Factor	In the field of law, what are the things that can influence/become a business/sales consideration in the next 5 years? (Examples of local content regulations, import duties, sales tax, anti-monopoly, or investment-related regulations, labor laws, consumer protection laws) [10].
Porter's Five Forces	Porter's five forces model is a tool for evaluating the competitive arena from all perspectives based on five fundamental forces. By identifying the strengths and direction of each strength, we can quickly assess the strength of an organization's position, along with its ability to generate profits or maintain profitability in a given industry. (van den Berg & Pietersma, 2015).	The threat of potential newcomers	What are the market opportunities and external threats of the company's market? [13] According to you, what are the business/sales conditions in the next 5 years? [10]. What are the obstacles to other companies entering the ceramic tile industry? [13]
		The threat of a replacement/substitute product	What products can be a threat to replace ceramic tile products? [13] What kind of adaptation does the company need to make in anticipating changes in the next 5 years? [10].
		Consumer bargaining power	What factors influence consumers' decisions to buy ceramic tile products? How sensitive is price to buying decisions? In your opinion, what are the challenges faced by companies to increase business/sales in the next 5 years? [10].
		Vendor bargaining power	How do you see the role of the bargaining power of suppliers/vendors in this ceramic tile manufacturing industry? [13]
		Competition between competing companies	What is the company doing to improve its current business/sales performance? [10] What are the Company's strengths and weaknesses? [10]. According to you, what have been the business/sales conditions over the past 3 years (2019 – 2021) both before, during the pandemic and after the pandemic? If your business/sales are currently declining or tending to increase, what do you think are the factors that cause it? [10].

The internal respondents amounted to 6 people who were the top leaders of PT ABC (I1-I6), with business and academic backgrounds, external respondents amounted to 3 people with business backgrounds (PT ABC vendors), and Government elements (E1-E3).

III. RESULT AND DISCUSSION

Scenario Framework

The results of the exploration through interviews with PT ABC stakeholders, using *PESTEL* and *Porter's Five Forces* tools to analyze macro/external conditions as well as micro conditions in the form of competitiveness information from within the industrial environment itself, obtained 50 *driving forces* that affect PT ABC's ceramic tile business. The next process in the exploration is to determine the main *critical uncertainties* that have the most impact on PT ABC's ceramic tile business until 2030, through a priority/ranking survey of stakeholders, 11 critical uncertainties were obtained to be ranked as impact values and *uncertainties* through a ranking survey to be mapped in Impact Uncertainty/Grid [8](Table 3, Table 4, Figure 1). To construct a 2x2 framework scenario, 2 of the most critical uncertainties are used (Figure 1)[8]. The results of each future scenario are described in Figure 1.

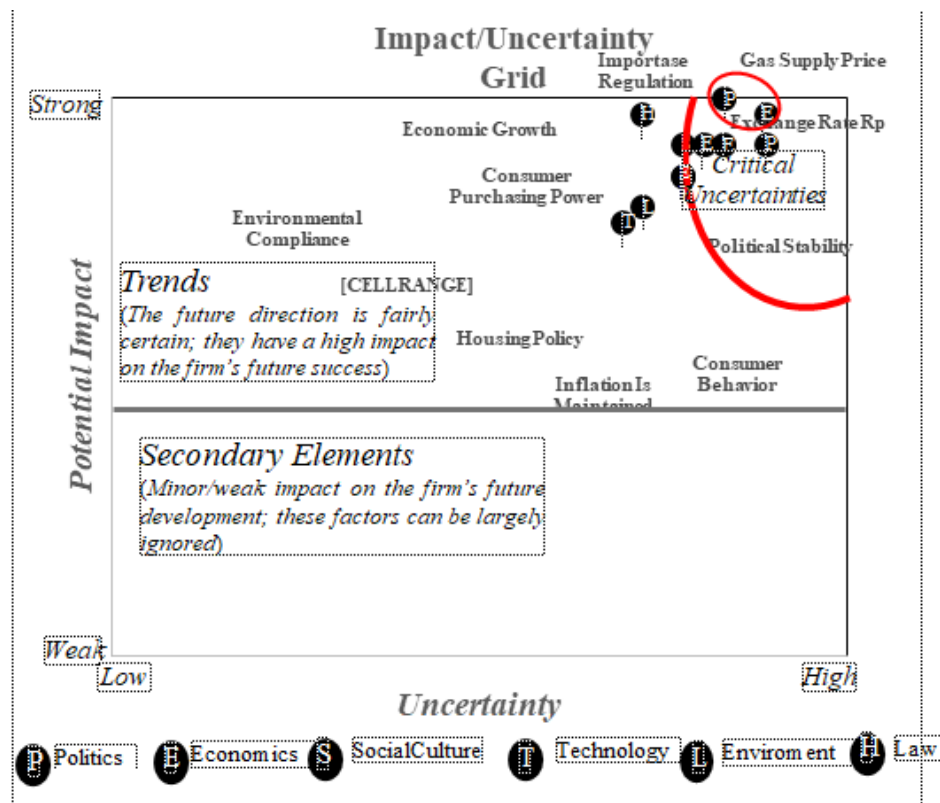
Table 2. Value of Impact Driving Forces

No.	Driving Forces	I1	I2	I3	I4	I5	I6	E1	E2	E3	Rerata
1	Government policy related to the price and supply of natural gas (P).	5	5	5	5	5	5	5	5	5	5
2	Import regulation (antidumping, safeguard, and HS Code) (H).	5	5	5	5	5	5	4	5	5	4.89

3	Rupiah exchange rate (E).	5	5	5	5	4	5	5	5	5	4.89
4	Political stability (P).	5	5	4	5	5	4	4	5	5	4.67
5	Purchasing power of the community (E).	4	5	5	5	5	4	4	5	5	4.67
6	Economic growth maintained (E).	5	4	5	5	4	4	5	5	5	4.67
7	Changes in consumer spending behavior (S).	4	5	5	5	5	4	4	5	5	4.67
8	Inflation rate maintained (E).	5	3	5	5	4	4	4	5	5	4.44
9	Government policies that support housing/infrastructure growth (P).	4	4	5	4	4	4	5	5	5	4.44
10	Compliance with environmental regulations and policies (L).	5	4	3	2	5	5	4	5	5	4.22
11	Digitization and automation of the supply chain (T).	4	3	4	5	4	3	4	5	5	4.11

Table 3. Nilai Uncertainties Driving Forces

No.	Driving Forces	I1	I2	I3	I4	I5	I6	E1	E2	E3	Rerata
1	Rupiah exchange rate (E).	5	4	5	5	4	4	4	5	5	4.56
2	Political stability (P).	5	4	4	5	5	4	4	5	5	4.56
3	Government policy related to natural gas prices and supply (P).	5	3	4	5	5	3	4	5	5	4.33
4	Purchasing power of the community (E).	4	4	4	5	5	3	4	5	5	4.33
5	Economic growth maintained (E).	4	4	4	5	4	4	3	5	5	4.22
6	Inflation rate maintained (E).	4	3	4	5	4	3	4	5	5	4.11
7	Government policies that support housing/infrastructure growth (P)	4	4	3	5	4	3	5	5	4	4.11
8	Changes in consumer spending behavior (S).	4	4	4	5	5	2	3	5	5	4.11
9	Import regulation (antidumping, safeguard and HS Code) (H).	5	2	3	5	5	3	3	5	4	3.89
10	Compliance with environmental regulations and policies (L).	5	4	3	2	5	2	4	5	5	3.89
11	Digitization and automation of the supply chain (T).	4	2	3	5	4	3	4	5	4	3.78

**Fig 1.** Uncertainty/Impact Grid

Scenario Narratives

The scenario framework (Fig. 2) describes four different scenarios of future conditions to be explored, where each scenario will provide input into contrasting business environment conditions to guide the business position or decision-making of PT ABC's stakeholders in the next 5 years (feed-forward system) [7]. This scenario matrix can be used as a management tool (leading indicators) to improve the quality of executive decision-making and help executives make better and more resilient strategic decisions [14]. The headlines of the four scenarios are the author's idea to make it easier to remember. The conditions of each scenario are as follows:

Civil War, a price war between local producers.

Conditions where the weak Rupiah exchange rate will slow down economic growth, increase inflation, reduce people's purchasing power, while the Government's policy for cheap gas prices will increase local manufacturing utilities, ceramic tile imports will decrease, so that there will be competition between local producers.

Infinity War, the price war of local and global producers.

Conditions where the policy of cheap gas prices will increase the utilization of local factories, the strength of the Rupiah will also increase purchasing power, and increase the import of ceramic tiles, business competition will occur between local producers themselves and tile importers/traders.

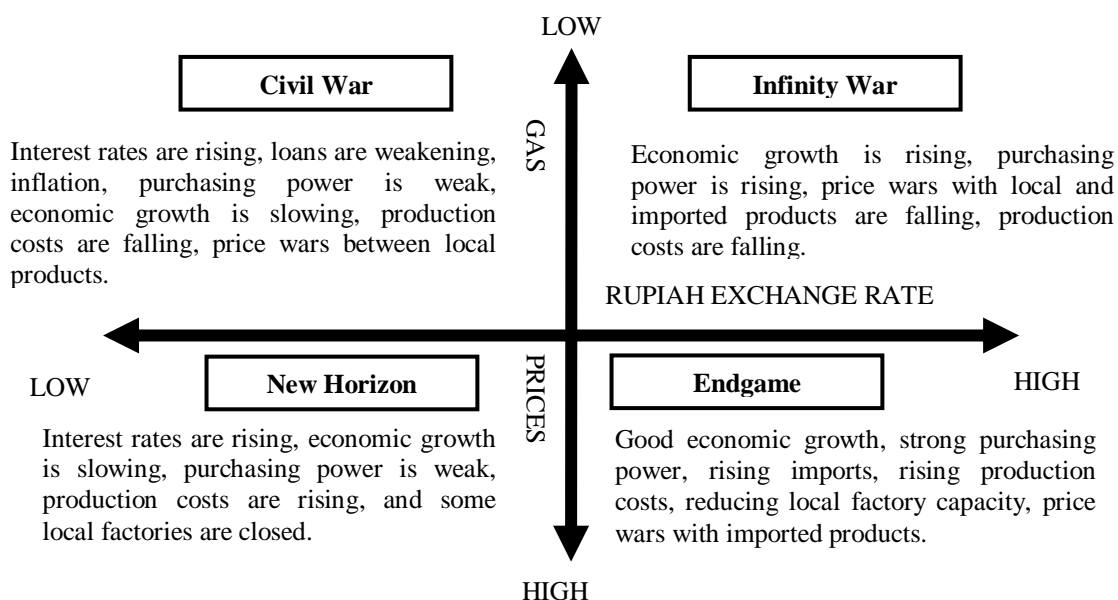


Fig 2. Scenario Framework

End Game, a global manufacturer dominates the local market.

Economic growth is good, purchasing power is rising, and imported products are flooding, while the Government does not support the policy of cheap gas prices, production costs will rise so that local producers will find it difficult to compete with imported products, some factories will reduce their capacity to maintain the inventory of finished products with excessive high costs.

New Horizon, fighting all the way.

Economic growth slowed down, inflation increased, purchasing power fell, production costs increased (US\$ percentage in the cost structure $\pm 40\%$, from gas, glaze raw materials and spare parts that are still imported), gas price policies add to the burden on factories, competition between local products and imports is very tight, factories with small capital are at risk of closing.

Implications and Options

The implications of each scenario are reviewed from the perspective of financial, operational, marketing, and human resources, which will provide options for PT ABC's business strategy. The options considered are:

- Related to investment and hedging.
- Supply chain efficiency, innovation, and collaboration.

- Pricing strategies, expand export and domestic markets.
- Recruitment and training.

Early Warning Signals

Environmental monitoring is carried out with an *early warning system*, followed by the use of scenarios to guide strategic options to be developed. These indicators provide an early warning system for future strategic choices [15]. Early warning signals that can indicate possible future direction and the likelihood of one scenario appearing over another [5][12] are as follows:

- APBN (the State Budget) deficit.
- The trend of percentage increase in Indonesia Crude Price (ICP) from the State Budget (APBN) assumption.
- The Fed Policy.
- Foreign exchange reserves.
- Current account deficit.
- Proposal of the Ministry of Industry and the associations of natural gas users.

Strategic Imperatives

In any scenario, PT ABC continues to carry out production cost optimization and energy efficiency programs such as the partial transfer of natural gas use with sustainable biomass, energy-saving kiln investment and waste reduction programs. In its marketing, PT ABC implements a pricing strategy and maintains customer loyalty through *dynamic pricing* based on gas fluctuations and Rupiah exchange rates, volume discounts for long-term customers (contractors, developers), strengthening sales through e-commerce platforms and B2B services for construction projects, market diversification, and premium product development, especially for export. Strengthen PT ABC's Research and Development (R&D) with innovation through digitalization, innovation of local raw materials, product development from waste and recycled materials, development of controller systems with IoT, ML/DL, and AI to improve factory efficiency, improve product quality (*vision inspection*), and detect market trends. PT ABC's resilient supply chain management, building strategic partnerships with local vendors through the VMI scheme, maintaining critical inventory levels of *glaze* raw materials (such as *zirconium silicate*, *frits*, *ink*) when the Rupiah strengthens or global prices fall, strategic contracts with transporters to maintain fuel fluctuations and changes in transportation regulations (ODOL).

Digitalization of the supply chain to measure service time/logistics costs to customers (IoT). PT ABC also conducts risk management, especially on the exchange rate of the Rupiah against the US dollar by *currency hedging*, uses *currency swaps* on the purchase of raw materials and imported spare parts, applies automatic price adjustment clauses in contracts with distributors if the price of gas or US dollars rises above a certain threshold (e.g. +10%). PT ABC has made a strategic plan to collaborate with the Government and stakeholders (ASAKI) so that the gas subsidy policy can be continued while the national ceramic tile industry improves in terms of efficiency, productivity and innovation for the use of renewable energy such as biomass in the ceramic tile manufacturing process. PT ABC must also be ready to face the worst situation and still be able to carry out its business by planning and conducting feasibility studies to diversify the business of replacing ceramic tiles as coating materials, such as LVT (Luxury Vinyl Tile) and SPC (Stone Polymer Composite) with the advantages of PT ABC compared to newcomers are a wide distribution network, factory locations near big cities (Jakarta, Bandung) and ports, minimal land and building investment costs.

IV. CONCLUSION

From the results of the research and mapping on the *Impact/Uncertainty Grid* (Fig. 1), the 2 (two) most critical uncertainties in PT ABC's business were identified that will be used for the preparation of the scenario. *The most critical uncertainties* are: **Government policy related to natural gas prices and supply (gas prices)** and **Rupiah exchange rates**.

PT ABC's business scenario planning, formed by the 2 most critical uncertainties, is as follows:

- **Civil War**, a price war between local producers.
In this scenario, the rupiah exchange rate against the US dollar weakens, and the Government provides a policy of cheap gas prices.
- **Infinity War**, price wars in local products themselves, as well as with imported products.
In this scenario, the exchange rate of the rupiah against the US dollar strengthens, and the Government provides a policy of cheap gas prices, imported products will flood the Indonesian market, and purchasing power will strengthen.
- **End Game**, imported products dominate the local market.
In this scenario, the exchange rate of the rupiah against the US dollar strengthens, purchasing power strengthens, but the Government revokes the policy of cheap gas prices.
- **New Horizon**, the local manufacturer, is fighting all the way.
In this scenario, the exchange rate of the rupiah against the US dollar weakens, purchasing power falls, but the Government revokes the policy of cheap gas prices.

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