

## Implementation of QSPM and Porter's Generic Strategy to Develop Mechanical Testing Laboratory in Indonesia

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### Abstract

*Mechanical testing is needed in almost all industry segments, such as in the automotive, plastics, food, packaging, steel, and medical equipment industries. Some examples of mechanical testing include tensile, compressive, tearing, fracture, puncture, and texture tests on food. This research is a descriptive qualitative type by describing the strategy of PT Premium Testing Lab (PTL) in order to developing new mechanical testing laboratory in Indonesia. PT PTL uses market penetration and differentiation strategies taken from QSPM analysis and Porter's Generic Strategy for establishing marketing, human capital and operational goals and objectives. The implementation of marketing strategy must also be supported by a good operational plan and strategy in the human capital division. All three must go hand in hand so that the company's goals can be achieved.*

### Keywords

mechanical testing; laboratory; internal and external analysis; strategy formulation; startup.



## I. Introduction

Choosing the right marketing strategy is one of the important processes that every company must do to achieve the company's targets that have been set. Many companies fail to implement their marketing strategies not only because of practical problems in management actions, but because of the conventional approach taken (Cespedes & Piercy, 1996).

The mechanical testing industry in Indonesia is dominated by government-owned test laboratories which have limitations in marketing implementation. Most of these centers are just waiting for customers to arrive, not introducing the company to potential customers. The number of large and medium scale manufacturing industries according to data from BPS Jawa Barat in 2018 (the book of Statistics for Large and Medium Industries West Java 2018) amounts to around 9,470 companies, where this number experienced a decline in growth of 6.64% from the previous year. From these number, the industries relevant to our mechanical testing are 5,565 companies. Meanwhile, the number of mechanical test labs in the West Java region is still small compared to the existing manufacturing industry, and they only serve certain industrial segments, and most of them are government testing house (Subhan et al., 2022).

Mechanical testing is needed to ensure that the materials or products produced are safe, strong, durable, and certified to ISO 17025. Every mechanical test carried out always refers to a testing standard, both local standards (SNI), international standards or even for customer standards. Mechanical testing is required for all industry segments, such as automotive, plastics, rubber, food, composites, packaging, textile, steel, and medical products industries.

PT Premium Testing Lab (PTL) is a startup company that provide solutions for mechanical testing application especially for manufacturing industries. PTL must make marketing goals that can support these goals in order to be achieved. The strategy taken is

market penetration for the customer segment in Lean Model Canvas, namely medium-large industries in West Java and East Java. PTL uses QSPM analysis to determine which strategy is most appropriate with the results of the company's external and internal analysis. A QSPM reveals the relative attractiveness of alternative strategies and thus provides objective basis for selecting specific strategies (David, 2016).

The Operational role cannot be underestimated. The pace of the business will be fast if the operational department implements the right and accurate strategy in executing all operational aspects in increasing the pace of business (Taryana et al., 2021). In setting operational goals PTL has several strategies so that the objectives can be in accordance with the company's vision and organizational goals. Operational objectives and targets must be able to facilitate the strategy made in the QSPM table, namely market penetration and business level strategy, namely differentiation. The strategy built on the marketing side must be in line with the capabilities of human resources and facilities owned by the company. Some of the business development undertaken by analyzing the business environment, developing business strategies, operational strategies, marketing strategies, human capital (HC) strategies, financial strategies and risk management. A good strategy in the field of human capital (HC) affects business development (Susananto et al., 2019)

Human capital goals and objectives are strategies in human resource management planning that provide a strategic framework to support long-term business goals and results. The aims and objectives in this chapter are made to support the chosen strategy, namely Market Penetration and Differentiation. The success of human resource planning will be determined by the accuracy of the strategy selection in designing the empowerment of human resources in the organization and predicting future needs in accordance with the dynamics of the company's business growth and development. Viewed from the point of view of the management process, human resource planning is not just related to the staffing function. However, from that, human resource planning includes various operating functions in implementing human resource management that are aligned with the implementation of the company's strategic management.

## **II. Research Method**

### **2.1 Marketing Strategy**

According to Porter's generic strategies allow organizations to gain competitive advantage from three different bases: cost leadership, differentiation, and focus (Gide, 1967). Considering that "cost leadership" is difficult to be approached for this business, PTL uses differentiation in terms of service quality and variety of tests that can be accommodated company. PTL prioritizes premium services for customers. Pre-consultation and Pre-test are the 2 main programs that we implement for free to provide satisfaction to customers. In addition, we also use premium testing machines made in Europe which make the test results from PTL very reliable in terms of accuracy. In addition, we also serve tests from various industrial sectors, in contrast to our competitors who usually only serve one industrial sector. PTL targets medium and large manufacturing industries in West Java and East Java which are engaged in the food (including packaging), plastic, automotive, metal, and medical equipment industries. Marketing is a process of planning and execution, starting from the conception stage, pricing, promotion, to the distribution of goods, ideas and services, to make exchanges that satisfy the individual and his institutions (Dianto in Asmuni et al, 2020). According to Tjiptono in Marlizar (2020) marketing performance is a function that has the greatest contact with the external

environment, even though the company only has limited control over the company's environment. In the world of marketing, consumers are assets that must be maintained and maintained their existence in order to remain consistent with the products we produce (Romdonny and Rosmadi, 2019).

In order to determine the right strategy, PT PTL uses QSPM to reveals the relative attractiveness of alternative strategies and provides objective basis for selecting specific strategies. PT PTL implements the results of the QSPM analysis and Porter's generic strategy on the company's goals and objectives.

IE Matrix also used to analyze the changing conditions and what strategic steps the company should take. The PTL business IE matrix fall in quadrant 2 which shows the company is in a position to grow and develop. Some of the suggested strategy options include market penetration, market development, product development and integrative (backward, forward integration). The choice of strategy chosen by PTL and will be outlined in the QSPM matrix is market penetration vs product development

From the results of the QSPM matrix, below it can be seen that the strategy for market penetration, namely recruiting experienced salespeople, has a greater appeal when compared to one of the product development strategies, namely opening a calibration lab. For this reason, PTL will focus on market penetration strategies, and just start to develop products in the long term. The opening of a calibration lab is also one of the business plans prepared by PTL in order to maximize existing opportunities. The following table is the assessment table for PT PTL's Decision stage.

**Table 1. Result Of QSPM Analysis**

Alternatif Strategy			Product Development		Market Penetration	
			Opening Calibration Lab		Sales Recruitment	
No	External Factor	Weight	AS	TAS	AS	TAS
<b>Opportunity</b>						
1	There is a change or addition of mandatory SNI for certain products	0,08	2	0,16	4	0,32
2	Consumer Protection Act	0,03	-	-	-	-
3	Recommendation from the ministry of industry for product/material certification	0,1	1	0,10	4	0,40
4	The Investment Climate in Indonesia encourages the manufacturing industry to move to Indonesia (Law on Job Creation No. 11 of 2020)	0,05	4	0,20	4	0,20
5	Manufacturing industry growth in Indonesia 0.6 to 3.73%	0,12	4	0,48	4	0,48
6	Manufacturing companies want to test in private laboratories because they are faster than government laboratories	0,09	1	0,09	4	0,36
7	There is a need to obtain accurate and reliable test results	0,09	4	0,36	2	0,18
8	There is a desire to easily monitor the testing process through an application on a smartphone	0,07	1	0,07	4	0,28
<b>Threat</b>						
1	Changes in test procedures or parameters to international standards, both ISO and ASTM	0,05	4	0,20	2	0,10
2	Policy changes related to SNI B/C/IEC 17025 'General Requirements for Competency of Testing Laboratories and Calibration Laboratories'	0,04	4	0,16	4	0,16
3	Issues related to dynamic labor regulations	0,05	-	-	-	-
4	Investment Climate Change for West Java region	0,07	3	0,21	3	0,21
5	Bank loan interest rates increase	0,06	-	-	-	-
6	High competition with similar business action	0,08	4	0,24	4	0,24
7	Technological developments that must continue to be upgraded following suppliers	0,04	2	0,08	1	0,04
<b>TOTAL</b>		<b>1,00</b>				
<b>Strength</b>						
1	Using premium grade testing machine made in Germany	0,08	1	0,08	3	0,24
2	Choosing a strategic location near the Cikarang industrial area	0,1	4	0,40	4	0,40
3	Become a pioneer of test centers that utilize android applications for tracking and documentation	0,07	1	0,07	4	0,28
4	PTL's speed of service, consulting and flexibility is above the competitors' average	0,1	2	0,20	4	0,40
5	Prices are in accordance with the services provided and the benefits received by consumers	0,06	2	0,12	3	0,18
6	Service mechanical testing from various industrial segments	0,06	1	0,06	4	0,24
7	Reliable test results	0,07	2	0,14	3	0,21
8	PTL has established a relationship with IQI and P3MID to expand its marketing networks	0,06	4	0,24	4	0,24
<b>Weakness</b>						
1	PTL MK is still limited	0,08	3	0,24	3	0,24
2	Limited funding	0,06	2	0,12	2	0,12
3	Unfamiliar trademark	0,1	3	0,30	4	0,40
4	Not many relationships with stakeholders	0,08	1	0,08	4	0,32
5	Offices / Buildings that are still for rent	0,06	-	-	-	-
<b>TOTAL</b>		<b>1,00</b>		<b>4,42</b>		<b>6,32</b>

PTL's business level strategy begins with a competitive force analysis that has been carried out. PTL is more inclined to service differentiation, because it is in accordance with our internal factors and our chosen target market. Therefore, in the image below, we conclude that our product-level strategy is the differentiation focus segment



Figure 1. Business Level Strategy

The mobility barrier in the picture above explains that the limits of market segmentation that can be served by each test center. For example, government-owned test centers, where they have been segmented according to their respective types of industry, for example BBLM which only plays in the metal industry may not be able to serve the packaging industry which has been served by BBKK. Meanwhile, Hi Test, although a private company, until now they only serve mechanical testing for Metals. PTL itself focuses on 5 types of industry, namely Plastic, Metal, Automotive, Packaging and Medical. If you want to focus on one type of industry, then PTL must buy non-destructive test equipment as well to be able to survive with only one type of industry.

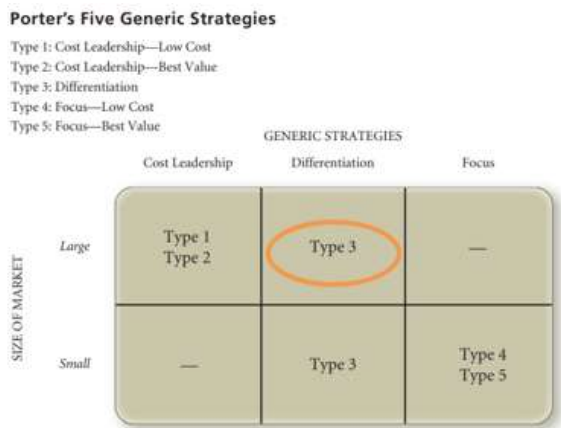


Figure 2. Porter's Five Generic Strategies

Type 3 taken by PTL represents differentiation in the Large Market, as previously mentioned that the number of manufacturing industries in the Bekasi and Karawang districts is more than 4000 units, and continues to grow from year to year.

## 2.2 Operational Strategy

In the application in part operational, there must be a method and stages in implementing the establishment of businesses by stages (Taryana, Yanuar Rahmat Syah et al., 2021). To establish PT we need to follow the applicable regulations in Indonesia. Registration is carried out on the OSS website by filling in the type of identity of the person in charge of the business, namely the NIK listed on the E-KTP for Indonesian citizens and the passport number for foreigners, country of origin, date of birth, cellphone number and e-mail address of the company to be registered. Next, OSS will send an activation request, and after that, it will send the Username and Password for the registered OSS account via e-mail, so make sure the e-mail address is filled incorrectly. After that, log in using the username and password following their respective access rights. OSS issues the NIB after the Business Actor has registered through the OSS website by first filling in data on the business sector. NIB is in the form of 13 (thirteen) random digit numbers secured and accompanied by an Electronic Signature. The NIB will also act as a Company Registration Certificate (TDP), Import Identification Number (API), and customs access rights. According to article 25, paragraph (1) of PP 24/2018, NIB is a business identity.

PT. The Premium Testing Lab will be located in the GIIC Cikarang industrial area, West Java. The location of the place was chosen based on a strategic place that is easily accessible by public transportation, close to the Jakarta-Cikampek toll access industrial area.

To establish a mechanical test laboratory, one of the important requirements that must be met is to equip it with facilities for administrative and testing activities. related to laboratory quality system standards, there are several requirements that must be met including ISO 17025 “General requirements for competence of testing laboratories and calibration laboratories”.



**Figure 3.** Accreditation Process for KAN

There is only 1 institution in Indonesia that is trusted by the government to accredit all types of laboratories, namely the National Accreditation Committee (KAN). The testing machines used by PT PTL are UTM, Hardness and fatigue testing machines. UTM is one of the main engines used to support market penetration and differentiation strategies. With UTM, various kinds of testing applications can be carried out as long as the machine capacity is still sufficient.

## 2.3 Human Capital Strategy

HC Development Strategy refers to targets, policies or standard procedures, training, and development budgets, training curriculum, and time of implementation (Susananto et al., 2019). Human capital goals and objectives are strategies in human resource management planning that provide a strategic framework to support long-term



business goals and results. Goals and objectives are made to support the chosen strategy from the results of the QSPM analysis and Porter's generic strategies namely market penetration and differentiation. The McKinsey 7S framework is also used by PTL to support the company's operations. In implementing the McKinsey 7S Framework for new companies, the first things to determine are Share Value and Strategy.



**Figure 4.** Framework McKinsey 7S

### III. Result and Discussion

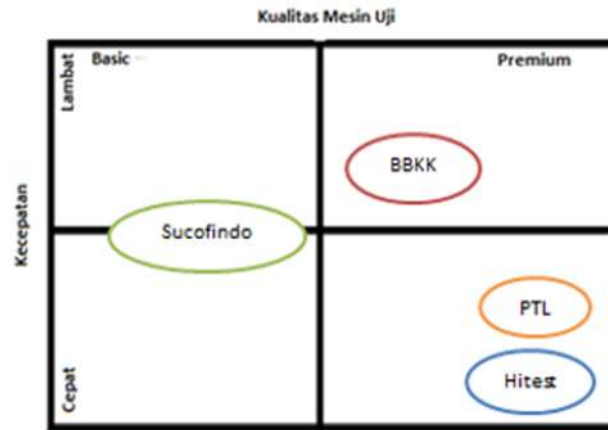
#### 3.1 Marketing Strategy

The marketing objectives of PT. PTL is in line with the company's strategy obtained through QSPM analysis and Business Level Strategy. The company's goals are divided into three categories that make it easier for companies to determine strategies to achieve these goals. The following is the division of the company's goals:

**Table 2.** Established Long Term Objectives

No	Short Term (1 – 2 years)	Mid Term (3 – 4 years)	Long Term (5 and above)
1.	Promoting the PTL Brand to manufacturing companies in Industrial Estates in Bekasi and Karawang Regency	100% customer retention	Achieving a market share of above 40% for mechanical testing in the West Java Area in 5 industrial segments.
2	Obtained a testing contract with a total of 11,000 specimens in year 2	Expanding the marketing area throughout West Java	Expanding marketing area to Industrial Estate in East Java
3	Develop marketing strategies through LinkedIn and Youtube social media	Collaborating with universities/polytechnics	Achieving the sales target of 400 calibration machines in the 5th year

While in the segmenting and targeting section, PT. PTL targets medium and large manufacturing industries in West Java. One of the reasons is that West Java Province has a much larger number of industries than others, even Karawang has been named the largest Industrial Estate in Southeast Asia at this time, for this reason, PTL focuses on the West Java area so it is very suitable for a market penetration strategy. As for positioning, PTL puts it in a 2-dimensional matrix with the speed and quality parameters of the test machine to represent the differentiation strategy



*Figure 5. Positioning PTL*

### 3.2 Operational Strategy

In setting operational goals PTL has several strategies so that the objectives can be in accordance with the company's vision and organizational goals. Operational goals and objectives must be able to facilitate the strategy made from the QSPM table, namely market penetration and porter's generic strategies, namely differentiation

**Table 3.** Established Operational Objectives

Short Term (1- 2 Years)	Mid Term (3 – 4 Years)	Long Term (> 5 Years)
Completing the mechanical test lab infrastructure for various testing applications	Added 1 UTM test machine	Opened the Calibration Division with KAN accreditation
PTL View application creation	Develop PTL View application	Added 2 sets of Calibration machines
Passed the ISO 17025 and ISO 9001 certification assessment		Added 1 Fatigue test machine

Services offered by PT. PTL is a destructive material testing service including tensile test, compression test, bending test, hardness test and fatigue test. Materials that can be served for testing at PT. PTL is in accordance with Table 4. This service was created to support a differentiation strategy in terms of services that can cover various industries. The length of testing services at PT PTL is calculated from the time the contract is signed is about 7 - 14 days depending on the number of specimens sent. Especially for fatigue testing because the time it takes is quite long and varies depending on the stiffness of the material and the testing requirements desired by the customer

**Table 4.** Testing Services PT PTL

No	Industry / material	Application	Remark
1	Metal	· Tensile	Maximum metal tensile 25 tons
		· Compress / Bend	Hardness load capacity 250 Kg
		· Hardness	· Fatigue test capacity 10 tons
		· Fatigue Test	
2	Plastic	· Tensile	· Rigid plastic
		· Compress / Bend	· Plastic Film (using a smaller loadcell)
		· Hardness	
3	Packaging	· Tensile	· Plastic Film (using a smaller loadcell)
		· Tear	· Cardboard Box
		· Peel	Bottle press test
		· Compress	· Peel adhesives tape (smaller loadcell)
4	Automotive	· Tensile	For automotive components
		· Compress / Bend	
		· Hardness	
		· Fatigue Test	
5	Medical equipment	· Tensile / Compress	Masks, gloves, syringes, drug packaging
6	Other	Other applications except fatigue	Garment, Makanan, kayu, keramik, Mahasiswa, Peneliti

### 3.3 Human Capital Strategy

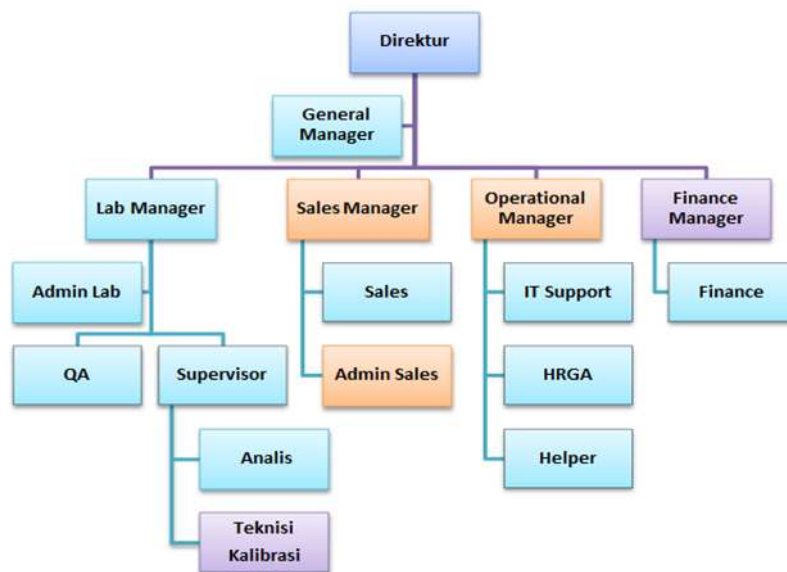
The success of human resource planning will be determined by the accuracy of strategy selection in designing the empowerment of human resources in the organization and predicting future needs in accordance with the dynamics of the company's business growth and development. The Human Capital objectives set by the Premium Testing Lab are based on the goals and business strategies listed in the results of the QSPM and Porter's generic strategies, namely market penetration and differentiation.

**Table 5.** Human Capital Objectives

No	Short Term 1-2 Years	Mid Term 3-4 Years	Long Term ≥ 5 Years
1	Get human resources who have dynamic and skilled competence skills	Improve solid and effective team work	Establish a calibration division
2	Provide regular training for Analysts and Sales for various material testing applications	Evaluating Employee Performance Appraisal System	Career development for PTL karyawan employees

To support the market penetration strategy, PTL has created an organizational structure which is divided into three phases according to the manpower needs each year. Where each individual or HR within the scope of the company has their respective positions and functions. Premium Testing Lab builds the following organizational structure:





**Figure 6.** *Organization Structure PT PTL*

The blue color represents the short-term structure, the orange color represents the medium-term organizational structure, while the purple color represents the long-term organizational structure. 1 of the McKinsey 7S framework, namely Style describes in the short term how a director is still involved in all lines of the company, where over time the main structure of the company is formed, the system will run, skills will develop, staff will increase and style will turn into responsibility per division.

#### IV. Conclusion

To be able to compete with competitors, new company must have marketing planning by paying attention to internal and external factors (Setiyawati et al., 2021). from internal and external analysis, PT PTL can use it for the decision stage, namely the analysis of strategy determination using the QSPM method. Conceptually, the QSPM determines the relative attractiveness of various strategies based on the extent to which key external and internal critical success factors are capitalized upon or improved. The relative attractiveness of each strategy within a set of alternatives is computed by determining the cumulative impact of each external and internal critical success factor. Any number of sets of alternative strategies can be included in the QSPM (David, 2016). Porter's generic strategies allow organizations to gain competitive advantage from three different bases: cost leadership, differentiation, and focus (Gide, 1967). Considering that "cost leadership" is difficult to be approached for this business, PTL uses differentiation in terms of service quality and variety of tests that can be accommodated company

The strategy built in the marketing division must be supported by adequate facilities in the operational division, while the human resources division must prepare the appropriate workforce for each job and ensure the welfare of employees, so that the company's goals and objectives can be achieved as expected.

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