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Determining Business Strategy of Inspection Companies in Oil and Gas Upstream Business Activities

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***Abstract*—Inspection companies supporting upstream oil and gas business activities with multi-owned businesses are demanded to compete and survive in increasingly fierce market competition. Differences in the characteristics and scope of each business unit makes the company encouraged to be more observant in seeing the position rate of development of each business unit. A strategy is needed to ensure the treatment of each of these business units in order to achieve company goals. Identification, clustering and analysis of influencing factors affecting the company business performance are carried out through the stages of collecting secondary and primary data to obtain a follow-up plan for each business unit of the company. We use the real case in one of Indonesian Inspection Company. The method used in this paper is the analysis of strategy formulation in determining business strategies by three stages. First stage IFE (Internal Factors Evaluation) matrix and EFE (External Factor Evaluation) matrix are prepared then follow by IE (Internal External Matrix). Second stage, by assesment the following matrixes, we matched up with SWOT (Strength, Weakness, Opportunity, and Threat) matrix. Finally the final stage is taken by using QSPM (Quantitative Strategic Planning Matrix) to determine reliable strategy for inspection company in the upstream oil and gas business activities.**

***Keywords*—Inspection Company, Business Strategy, Strategy Formulation, SWOT, QSPM.**

I. INTRODUCTION

THE variety of service products, segmentation and scope of competition makes companies respond to these challenges by forming certain business units to respond to the needs of the inspection market with different job characteristics. This condition triggers companies to be required to be able to compete, survive, read opportunities and quickly take a position in determining the right strategy for their business units. The existence of four business units, requires the company to be more careful in evaluating performance and achievements in order to determine the right steps for future business development. A proper business strategy is needed in order to determine a follow-up plan for the development of each company's business unit in relation to the existence of competitive and dynamic market competition. Adaptation to advanced technology, dynamic environment and complexity are the main problems of organizations. The market is becoming more competitive and learning faster and faster than competitors is a potential advantage, as a result, organizations focus on knowledge and awareness [13]. Previous studies on business strategy analysis in the journal "Business Strategy Analysis of

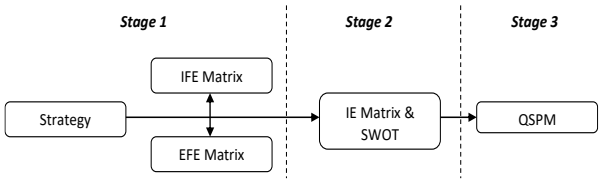

Figure 1. Strategy Formulation.

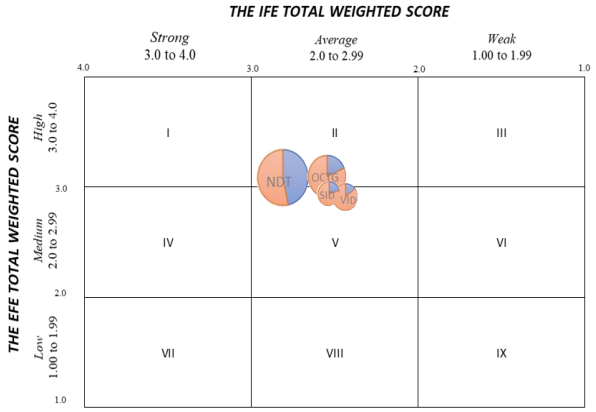

Figure 2. IE Matrix.

SWOT MATRIX	Strengths (IFE) ⇩	Weaknesses (IFE) ⇩
⇨ Opportunities (EFE)	SO Strategies	WO Strategies
⇨ Threats (EFE)	ST Strategies	WT Strategies

Figure 3. SWOT Matrix Formulation.

Inspection Companies in the Technical Inspection Service Industry in Indonesia". Another paper explains that the objectives of her research are: (a) to identify internal and external factors that influence the technical inspection service industry; (b) to find a suitable and effective business strategy for the Inspection Firm in order to improve sales performance in an environment of strong competition. Data collection techniques needed in research using primary data (information and data) (case studies and literature). The first step in this research is the input stage, followed by the matching stage, and the last stage is the decision analysis. The results of this study are: (a) the strategy recommended for the Inspection Company is product development; (b) the second

Table 1.
EFE Matrix SID

	Opportunities and Threats	Weight	Rating	Weighted Score
O1	Commencement of 12 national upstream oil and gas strategic projects in 2020	0,08	4	0,32
O2	Oil price Q3 2020 above 40 USD / Barrel from 12 USD / Barrel Q2 2020	0,07	3	0,21
O3	Commencement of the RDMP 5 refinery project worth of 210 trillion Rupiah.	0,08	3	0,24
O4	Demand of Inspection and Certification in all upstream oil and gas areas	0,05	3	0,15
O5	An integrated procurement system with SKK Migas e-Procurement	0,05	4	0,20
O6	Three Star Category Inspection Company	0,06	4	0,24
O7	ISO 9001, ISO 14001, and OHSAS 18001 standardized companies.	0,04	1	0,04
O8	Partnership with national and international oil and gas inspection companies	0,03	3	0,09
O9	2.135 MW Fossil Power Plant conversion program into Renewable Power Plant	0,04	2	0,08
O10	The government is targeting 19.9 GW of EBT installed by 2025	0,03	2	0,06
T1	The investment realization in the upstream oil and gas sector in the first semester of 2020 was US $ 5.6 billion or 39 percent of this year's target of US $ 14 billion	0,06	2	0,12
T2	Reduction of oil lifting target from 775 BOPD to 705 BOPD	0,04	2	0,08
T3	Increase in the number of inspection companies having 3 star category	0,03	2	0,06
T4	90% of contracts obtained from the open auction process	0,03	2	0,06
T5	Increasing market competition and the world oil price crisis.	0,06	3	0,18
T6	Oncall contract pattern, difficult personnel allocation and high travel costs	0,05	3	0,15
T7	Covid-19 pandemic conditions.	0,07	4	0,28
T8	Renegotiation and termination of existing contracts..	0,08	4	0,32
T9	Expensive investment costs in human resources, equipment and technology.	0,02	3	0,06
T10	Fast changing laws and regulations.	0,03	1	0,03
	TOTAL	**1,00**		**2,97**

Table 2.
EFE Matrix VID

	Opportunities and Threats	Weight	Rating	Weighted Score
O1	Commencement of 12 national upstream oil and gas strategic projects in 2020	0,08	3	0,24
O2	Oil price Q3 2020 above 40 USD / Barrel from 12 USD / Barrel Q2 2020	0,07	3	0,21
O3	Commencement of the RDMP 5 refinery project worth of 210 trillion Rupiah.	0,08	4	0,32
O4	Demand of Voluntary Inspection in all upstream oil and gas areas	0,05	3	0,15
O5	An integrated procurement system with SKK Migas e-Procurement	0,05	4	0,20
O6	Three Star Category Inspection Company	0,06	4	0,24
O7	ISO 9001, ISO 14001, and OHSAS 18001 standardized companies.	0,04	1	0,04
O8	Partnership with national and international oil and gas inspection companies	0,03	4	0,12
O9	2.135 MW Fossil Power Plant conversion program into Renewable Power Plant	0,04	2	0,08
O10	The government is targeting 19.9 GW of EBT installed by 2025	0,03	2	0,06
T1	The investment realization in the upstream oil and gas sector in the first semester of 2020 was US $ 5.6 billion or 39 percent of this year's target of US $ 14 billion	0,06	2	0,12
T2	Reduction of oil lifting target from 775 BOPD to 705 BOPD	0,04	1	0,04
T3	Increase in the number of inspection companies having 3 star category	0,03	2	0,06
T4	90% of contracts obtained from the open auction process	0,03	2	0,06
T5	Increasing market competition and the world oil price crisis.	0,06	2	0,12
T6	Oncall contract pattern, difficult personnel allocation and high travel costs	0,05	3	0,15
T7	Covid-19 pandemic conditions.	0,07	4	0,28
T8	Renegotiation and termination of existing contracts..	0,08	4	0,32
T9	Expensive investment costs in human resources, equipment and technology.	0,02	3	0,06
T10	Fast changing laws and regulations.	0,03	1	0,03
	TOTAL	**1,00**		**2,90**

recommendation of the business strategy is horizontal integration [8].

Another study on business strategy in inspection companies is a scenario-based road mapping method for strategic planning and forecasting: A case study in a testing, inspection and certification company [4]. Suggested that flexibility is a key factor when dealing with future changes in complex and fast-changing business environments. Various researchers and practitioners pay attention to the concept of planning scenarios with roadmaps in market and technology activities. The scenario-based roadmap method is conceptual for embedding future change scenarios into a roadmap for strategic planning and decision making at the organizational level. The proposed methods are designed and developed for companies to build scenarios that might reflect future situations in practice, to assess the impact of each scenario, and to develop a road map that combines external and internal problems and actions according to the scenario. The above background is the initial basis for the next step of the study to determine a business strategy for an inspection company for upstream oil and gas activities.

Based on the above background, the formulation of the problem in this study is how to determine a business strategy for inspection service companies that support upstream oil and gas business activities. The purpose of this research is to determine the business strategy of the inspection service company in the upstream oil and gas business activities with three stages;

1. Input Stage: determines internal and external factors affecting the inspection company's business performance.
2. Matching stage: matching to come up with alternative

Table 3.
EFE Matrix NDT

	Opportunities and Threats	Weight	Rating	Weighted Score
O1	Commencement of 12 national upstream oil and gas strategic projects in 2020	0,08	4	0,32
O2	Oil price Q3 2020 above 40 USD / Barrel from 12 USD / Barrel Q2 2020	0,07	4	0,28
O3	Commencement of the RDMP 5 refinery project worth of 210 trillion Rupiah.	0,08	4	0,32
O4	Demand of NDT Inspection in all upstream oil and gas areas	0,05	3	0,15
O5	An integrated procurement system with SKK Migas e-Procurement	0,05	3	0,15
O6	Three Star Category Inspection Company	0,06	3	0,18
O7	ISO 9001, ISO 14001, and OHSAS 18001 standardized companies.	0,04	1	0,04
O8	Partnership with national and international oil and gas inspection companies	0,03	2	0,06
O9	2.135 MW Fossil Power Plant conversion program into Renewable Power Plant	0,04	2	0,08
O10	The government is targeting 19.9 GW of EBT installed by 2025	0,03	2	0,06
T1	The investment realization in the upstream oil and gas sector in the first semester of 2020 was US $ 5.6 billion or 39 percent of this year's target of US $ 14 billion	0,06	2	0,12
T2	Reduction of oil lifting target from 775 BOPD to 705 BOPD	0,04	2	0,08
T3	Increase in the number of inspection companies having 3 star category	0,03	2	0,06
T4	90% of contracts obtained from the open auction process	0,03	2	0,06
T5	Increasing market competition and the world oil price crisis.	0,06	3	0,18
T6	Oncall contract pattern, difficult personnel allocation and high travel costs	0,05	3	0,15
T7	Covid-19 pandemic conditions.	0,07	4	0,28
T8	Renegotiation and termination of existing contracts..	0,08	4	0,32
T9	Expensive investment costs in human resources, equipment and technology.	0,03	3	0,09
T10	Bank interest is quite high on the financing of inspection projects	0,02	2	0,04
	TOTAL	**1,00**		**3,02**

Table 4.
EFE Matrix OCTG

	Opportunities and Threats	Weight	Rating	Weighted Score
O1	Commencement of 12 national upstream oil and gas strategic projects in 2020	0,08	4	0,32
O2	Oil price Q3 2020 above 40 USD / Barrel from 12 USD / Barrel Q2 2020	0,09	4	0,36
O3	Commencement of the RDMP 5 refinery project worth of 210 trillion Rupiah.	0,05	2	0,10
O4	Demand of OCTG Inspection in all upstream oil and gas areas	0,05	3	0,15
O5	An integrated procurement system with SKK Migas e-Procurement	0,05	4	0,20
O6	Three Star Category Inspection Company	0,06	4	0,24
O7	ISO 9001, ISO 14001, and OHSAS 18001 standardized companies.	0,04	1	0,04
O8	Partnership with national and international oil and gas inspection companies	0,03	3	0,09
O9	2.135 MW Fossil Power Plant conversion program into Renewable Power Plant	0,05	3	0,15
O10	The government is targeting 19.9 GW of EBT installed by 2025	0,03	2	0,06
T1	The investment realization in the upstream oil and gas sector in the first semester of 2020 was US $ 5.6 billion or 39 percent of this year's target of US $ 14 billion	0,06	2	0,12
T2	Reduction of oil lifting target from 775 BOPD to 705 BOPD	0,04	2	0,08
T3	Increase in the number of inspection companies having 3 star category	0,03	2	0,06
T4	90% of contracts obtained from the open auction process	0,03	2	0,06
T5	Increasing market competition and the world oil price crisis.	0,06	3	0,18
T6	Oncall contract pattern, difficult personnel allocation and high travel costs	0,05	3	0,15
T7	Covid-19 pandemic conditions.	0,07	4	0,28
T8	Renegotiation and termination of existing contracts..	0,08	4	0,32
T9	Expensive investment costs in human resources, equipment and technology.	0,03	3	0,09
T10	Bank interest is quite high on the financing of inspection projects.	0,02	2	0,04
	TOTAL	**1,00**		**3,09**

strategies that can be implemented by combining external and internal factors.

3. Decision stage: determine the appropriate alternative strategy based on the input stage until the matching stage.

II. LITERATURE REVIEW

A. Position of Inspection Company in Oil and Gas Upstream Business Activities

Referring to the Law of the Republic of Indonesia No.22 of 2001 concerning Oil and Gas Article 1 Paragraph 7, it is stated that upstream business activities are business activities that are based on or are based on exploration and exploitation business activities. Then it is further explained in Article 1 Paragraph 8 and 9, namely regarding exploration as a definition of activities aimed at obtaining information on geological conditions to find and obtain an estimate of oil and gas reserves in the specified working area [10]. And exploitation which is defined as a series of activities aimed at producing oil and natural gas from a designated working area, which consists of drilling and completion of wells, construction of transportation, storage and processing facilities for separation and refining of oil and gas in the field and other supporting activities [6]. Another research explains that the need to create value and increase production, creates enormous economic potential by new exploration opportunities, and the complexity of challenges must be faced by strategists and managers of upstream oil and gas business activities who require new approaches. and more effectively to carry out supervision and strategic implementation. In order to survive and thrive in this completely changing

Table 5.
IFE Matrix SID

	Strengths and Weaknesses	Weight	Rating	Weighted Score
S1	Profit ratio of 51.2% to sales, the highest among other business units.	0,09	4	0,36
S2	Direct cost ratio of 48.8% to sales, the lowest among other units	0,08	4	0,32
S3	Has more than 50 experts with national and international qualifications.	0,06	3	0,18
S4	A wide variety of service products, more than 25 certification methods.	0,06	3	0,18
S5	More than 35 years of experience in the certification services industry	0,10	4	0,40
S6	As a public listed company.	0,03	3	0,09
S7	Advanced technology inspection equipment and valid calibration.	0,04	3	0,12
S8	Has international standard training facilities.	0,03	3	0,09
S9	Has a development and training program for Experts.	0,05	3	0,15
S10	Has a network of branches in most of the upstream oil and gas areas.	0,05	3	0,15
W1	Sales in 2019 decreased -29.4% YoY compared to 2018	0,08	1	0,08
W2	Profit in 2019 decreased -32% YoY compared to 2018	0,08	1	0,08
W3	Lack of strong marketing and product advertising efforts.	0,04	1	0,04
W4	The absence of a R&D department for inspection products development.	0,05	2	0,10
W5	Quite high turn-over of expertis.	0,04	1	0,04
W6	Overhead costs are increasing every year.	0,03	2	0,06
W7	The absence of department that calculates and verifies the Level of Domestic Content (TKDN)	0,04	1	0,04
W8	Training and certification cost are increasing every year.	0,02	2	0,04
W9	The use of IT in database systems and business intelligence is not optimal yet.	0,03	1	0,03
	TOTAL	**1,00**		**2,55**

Table 6.
IFE Matrix VID

	Strengths and Weaknesses	Weight	Rating	Weighted Score
S1	2019 sales increased by 49.2% YoY in 2018	0,09	4	0,36
S2	Profit in 2019 increased by 106.8% YoY in 2018	0,07	4	0,28
S3	More than 30 national and international qualified experts and engineers.	0,06	3	0,18
S4	A wide variety of products and services, more than 20 inspection methods.	0,06	3	0,18
S5	Experience of more than 30 years in the voluntary inspection industry	0,09	3	0,27
S6	As a public listed company.	0,03	3	0,09
S7	Advanced technology inspection equipment and valid calibration.	0,04	3	0,12
S8	Has international standard training facilities.	0,03	3	0,09
S9	Has a development and training program for Experts.	0,05	3	0,15
S10	Has a network of branches in most of the upstream oil and gas areas.	0,05	3	0,15
W1	The profit contribution was 14.1% to total profit, the lowest among others.	0,08	2	0,16
W2	Does not have its own inspection data processing software.	0,08	1	0,08
W3	Lack of strong marketing and product advertising efforts.	0,06	1	0,06
W4	The absence of a R&D department for inspection products development.	0,05	2	0,10
W5	Quite high turn-over of expertis.	0,04	1	0,04
W6	Overhead costs are increasing every year.	0,03	2	0,06
W7	The absence of department that calculates and verifies the Level of Domestic Content (TKDN)	0,04	1	0,04
W8	Training and certification cost are increasing every year.	0,02	2	0,04
W9	The use of IT in database systems and business intelligence is not optimal yet.	0,03	1	0,03
	TOTAL	**1,00**		**2,48**

business environment, companies need to develop and implement strong dynamic capabilities [11].

B. Inspection Company and Its Business Units

In this study, strategy formulation analysis was carried out at the business unit level in an inspection company. There are 4 (four) business units that will be analyzed the strategy formulation, each business unit is the company's profit center. These business units are the Statutory Inspection Department (SID), Voluntary Inspection Department (VID), Non-Destructive Testing Department (NDT) and Oil Country Tubular Goods Department (OCTG). Before determining a strategy at the corporate level, companies with multiple businesses must identify the position of each business unit. The process of identifying the position of a business unit from time to time can be a major starting point, especially following feedback from stakeholders, including customers and business unit managers in determining the strategy to be implemented [2]. Furthermore, internal and external environmental factors can be scanned systematically, taking into account different markets and characteristics as well as economic and political factors, discussed in detail in the influencing factors section. Goals are formulated to reflect the way the organization positions itself in the market based on guidelines from the internal conditions of the company and what it finds out from environmental analysis outside the company. With this, each functional manager formulates his or her own departmental plan for building business-level and firm-level strategies [3].

C. Factors Affecting Business Units Performance

It is necessary to identify the factors that affect the performance of the company's business units. By identifying future events that could have a major impact on the company and by making reasonable assumptions about those factors, strategists can bring the strategic management process forward. Without reasonable assumptions, the strategy formulation process cannot run effectively. Companies that have the best information generally make the most accurate assumptions, which can result in a major competitive

Table 7.
IFE Matrix NDT

	Strengths and Weaknesses	Weight	Rating	Weighted Score
S1	Contributed 44.9% to total sales, the highest of all business units.	0,09	4	0,36
S2	Contributed 46.7% to total profit, the highest of all business units.	0,07	4	0,28
S3	Has more than 80 NDT experts with national and international qualifications	0,06	3	0,18
S4	A very wide variety of service products, more than 30 NDT methods	0,06	4	0,24
S5	Company experience for more than 45 years in the NDT inspection industry.	0,09	4	0,36
S6	Has NDT ASNT Level 3 experts.	0,07	4	0,28
S7	Advanced technology inspection equipment and valid calibration.	0,04	3	0,12
S8	Has international standard training facilities.	0,04	3	0,12
S9	Has a development and training program for Experts.	0,05	3	0,15
S10	Has a network of branches in most of the upstream oil and gas areas.	0,05	3	0,15
W1	Penjualan tahun 2019 turun -16,6% YoY dibandingkan tahun 2018	0,07	1	0,07
W2	Profit tahun 2019 turun -22,5% YoY tahun 2018	0,06	1	0,06
W3	Proses pengadaan material dan peralatan cukup lama.	0,05	2	0,10
W4	Lack of strong marketing and product advertising efforts.	0,05	1	0,05
W5	The absence of a R&D department for inspection products development.	0,04	2	0,08
W6	Overhead costs are increasing every year.	0,02	2	0,04
W7	The absence of department that calculates and verifies the Level of Domestic Content (TKDN)	0,04	1	0,04
W8	Training and certification cost are increasing every year.	0,02	2	0,04
W9	The use of IT in database systems and business intelligence is not optimal yet.	0,03	1	0,03
	TOTAL	**1,00**		**2,75**

Table 8.
IFE Matrix OCTG

	Strengths and Weaknesses	Weight	Rating	Weighted Score
S1	2019 sales increased by 93.2% YoY compared to 2018	0,09	4	0,36
S2	Profit in 2019 increased by 16.7% YoY compared to 2018	0,07	4	0,28
S3	Has more than 40 experts with national and international qualifications	0,06	3	0,18
S4	A very wide variety of service products, more than 20 methods	0,06	3	0,18
S5	Company experience for more than 35 years in the OCTG inspection industry.	0,09	4	0,36
S6	As a public listed company.	0,03	3	0,09
S7	Advanced technology inspection equipment and valid calibration.	0,04	3	0,12
S8	Has international standard training facilities.	0,04	3	0,12
S9	Has a development and training program for Experts.	0,05	3	0,15
S10	Has a network of branches in most of the upstream oil and gas areas.	0,05	3	0,15
W1	Profit ratio of 21.0% to sales, the lowest among other business units.	0,08	2	0,16
W2	Direct cost ratio of 79.0% to sales, the highest among other business units.	0,08	1	0,08
W3	Proses pengadaan material dan peralatan cukup lama.	0,05	2	0,10
W4	Lack of strong marketing and product advertising efforts.	0,05	1	0,05
W5	The absence of a R&D department for inspection products development.	0,04	1	0,04
W6	Overhead costs are increasing every year.	0,03	1	0,03
W7	The absence of department that calculates and verifies the Level of Domestic Content (TKDN)	0,04	1	0,04
W8	Training and certification cost are increasing every year.	0,02	2	0,04
W9	The use of IT in database systems and business intelligence is not optimal yet.	0,03	1	0,03
	TOTAL	**1,00**		**2,56**

advantage [5]. Selection of internal key factors that will be further identified as strengths and weaknesses of each company business unit. is determined by considering things such as, experts (inspectors), management and organization, corporate finance (sales and profit), company's experience, inspection service product varieties, marketing, equipment & technology, information technology, training facilities, human resources development program, license, company status, and branch network. While the selection of external key factors that will be further identified as opportunities and threats to each business unit of the inspection company is determined by considering the external factors of the inspection company as follows, conditions of the upstream oil and gas industry, costumers, laws and regulations, competitors, economic conditions, domestic inspection markets, social conditions, project procurement systems, and covid-19 pandemic situations.

D. The Role of Company Managers in Strategy Formulation Analysis

The management of an institution and a company, no matter they run a state or private institution, usually holds several meetings a month and maybe a week. At least one of these meetings requires decision making to influence the future of the institution and even the structure of the company [12]. Managers must have an entrepreneurial vision, eager to study the company, the philosophy of competition, realize the importance of strategic competitiveness, consider self-motivated management important, be creative in decision-making, be clear about their vision and duties and responsibilities, be entrepreneurial, trained in strategic planning. , believe that their strategies are in line with the company culture and motivate employees, are good at finding new solutions to problems, are future-oriented and think that

Table 9.
Strategy Alternatives for QSPM Formulation

Unit Business	ALTERNATIVE STRATEGIES 1	2
SID	Reduce product prices by 5% to increase sales volume.	Maximizing the utilization of contract value for current contracts
VID	Developing Risk Based Inspection (RBI) and Asset Integrity Management System (AIMS) software.	Considering opportunities to partner or consortium with competitors in large tenders with complex SOWs.
NDT	Increase investment in advanced NDT equipment to expand product range and increase sales ratios.	Considering opportunities for acquisitions, partnerships or consortiums with advanced NDT start-up company competitors with "specialty services" at large tenders and complex SOWs.
OCTG	Maximizing the utilization of contract value for current contracts.	Increase product prices by 5-10% and perform direct project cost efficiency to increase the percentage of profit..

Table 10.
STAS Results on The Inspection Company QSPM Matrix

Unit Bisnis	STAS Strategy 1	STAS Strategy 2	Chosen Strategy Based on QSPM
SID	**2,67**	2,45	Reduce product prices by 5% to increase sales volume.
VID	3,26	**3,95**	Considering opportunities to partner or consortium with competitors in large tenders with complex SOWs.
NDT	2,74	**3,03**	Considering opportunities for acquisitions, partnerships or consortiums with advanced NDT start-up company with "specialty services" at large tenders and complex SOWs.
OCTG	2,61	**2,79**	Increase product prices by 5-10% and perform direct project cost efficiency to increase the percentage of profit..

the company and their work are contributing to their social life and to their personal development [9].

Meanwhile another researcher explained that the concept of the capability of strategy formulation based on practical knowledge management was obtained through empirical studies. Although the study aimed to determine the relationship between knowledge management practices and the ability of strategy formulation through a limited data set, a significant correlation between the two variables was revealed. This correlation shows that the capability of strategy formulation can be done more effectively by utilizing knowledge management practices [1]. To achieve superior performance, managers must consider the nature of strategy formulation capabilities when developing knowledge management practices as well. Management practice can develop better strategies which are supported by this empirical study. From the explanation it is explained that strategy is about choice and the essence of the company's strategy is what is chosen to do and not to do. The quality of managers' strategic thinking as a factor determining these choices is the main driver of the success of the company's strategy [7].

III. METHODOLOGY OF STRATEGY FORMULATION

According to Strategic management can be defined as the art and science of formulating, implementing, and evaluating cross-functional decisions that enable an organization to achieve its goals. He explained that the strategic management process consists of three stages, namely, formulating strategies, implementing strategies and evaluating strategies [5]. This paper only focuses on how to formulate a strategy. Strategy formulation techniques or strategy formulation can be integrated into a three-stage decision-making framework; stage 1 The input stage, stage 2 The matching stage, 3 The decision stage [5]. The tools presented in this framework are applicable to all sizes and types of organizations and can help strategists identify, evaluate and select strategies. The stages of this strategy formulation can be shown in Figure 1 as follows;

Stage 1 aims to summarize the basic information needed to formulate strategies. Stage 2 aims to come up with alternative strategies that can be implemented by combining external and internal factors. Stage 3 aims to use the input information from Phase 1 to evaluate objectively implementable alternative strategies from the Phase 2 results, so as to provide an objective basis for selecting the most appropriate strategies. In this study, the input stage only uses the IFE Matrix (Internal Factor Evaluation) and the Matrix (External Factor Evaluation), while the CPM (Competitive Profile Matrix) Matrix is not used because CPM is a tool strategists use to compare companies and their competitors and reveal their strengths and strengths. their relative weaknesses, whereas in this study the scope of the problem is limited to the scope of each business unit in an inspection company

A. External Factor Evaluation Matrix (Input Stage)

The External Factor Evaluation Matrix (EFE) enables strategists to summarize and evaluate economic, social, cultural, demographic, environmental, political, governance, legal, information technology, and competitive [5]. The EFE matrix can be developed in five steps, the first one is name the main external factors as identified in the external audit process, second step assign each weighting factor to the range from 0.0 (not important) to 1.0 (very important). The sum of all weights assigned to the factors must equal 1.0, third step Assign a rating between 1 and 4 for each major external factor to show how effectively the company's current strategy is responding to the factors, where 4 = superior response, 3 = above average response, 2 = average response, and 1 = bad response. Then multiply the weight of each factor by its rating to determine the weighted score and finally sum the weighted scores for each variable to determine the total weighted score for the organization. Regardless of the number of major opportunities and threats included in the EFE Matrix, the highest possible total weighted score for an organization is 4.0 and the lowest possible.

In Table 1, managers provide various ratings for each of the strengths and weaknesses. Where O1, O5 and O6 are the main opportunity factors for the business unit while T7 and

T8 are considered the main threat factors for the SID business unit.

It can be seen from Table 2 for the EFE matrix in the VID business unit, that the highest weighting on the opportunity factor is accepted by O1 and O3 as the most important factor that shows the relative importance of these factors for success in the company's industry. As for the threat factor, the highest weight was accepted by T8 as the factor considered to have the greatest threat effect on the performance of the business unit.

Whereas in Table 3, managers provide various ratings for each of the strengths and weaknesses. Where O1, O2, and O3 are the main opportunity factors for the business unit, while T7 and T8 are considered the main threat factors for the NDT business unit.

From Table 4 for the EFE matrix in the OCTG business unit, it is found that the highest weighting on the opportunity factor is also still accepted by O2 as the most important factor that shows the relative importance of these factors for success in the company's industry. Meanwhile, for the threat factor, the highest weight was also accepted by T8 as the factor considered to have the greatest threat effect on the performance of the business unit.

B. Internal Factor Evaluation Matrix (Input Stage)

The summary step in conducting an internal strategic management audit is to build an Internal Factor Evaluation Matrix (IFE) [5]. This strategy formulation tool summarizes and evaluates the main strengths and weaknesses in the functional areas of the business, and also provides a basis for identifying and evaluating the relationships between these areas. For a scientific approach, an intuitive assessment is required in developing the IFE Matrix. An understanding of the factors entered is more important than the actual figures. The IFE matrix can be developed in five steps. First, mention the main internal factors as identified in the internal audit process. Use a total of 10 to 20 internal factors, including strengths and weaknesses. Second, assign a weight ranging from 0.0 (not important) to 1.0 (all important) for each factor. The sum of all weights must equal 1.0. Third, ssign a 1-to-4 rating for each factor to indicate whether the factor represents a major weakness (rating = 1), minor weakness (rating = 2), minor strength (rating = 3), or major strength (rating = 4) . Note that strengths must receive a rating of 3 or 4 and weaknesses must receive a rating of 1 or 2. Then, multiply the weight of each factor by its rating to determine the weighted score for each variable. Finally, sum the weighted scores for each variable to determine the total weighted score for the organization. Regardless of how many factors are included in the IFE Matrix, the total weighted score can range from low 1.0 to high 4.0, with an average score of 2.5. A total weighted score well below 2.5 is a sign of a weak organization internally, while a score significantly above 2.5 indicates a strong internal position. The IFE matrix should cover from 10 to 20 key factors. The number of factors has no effect on the total weighted score range because the total weighting is always 1.0 [5].

It can be seen from the strengths and weaknesses in Table 5 that each one receives a high weight as the most important factor. On the assessment of the strength factor rating received a score of 3 and 4 while the weakness factor got a score of 1 and 2.

From Table 6 the input stages for the IFE matrix in the VID business unit, it is known that the highest weighting on the strength factor is accepted by S1 and S5 as the most important factor that shows the relative importance of these factors for success in the company's industry. As for the weakness factor, the highest weight is accepted by W1 and W2 as the factor that is considered to have the greatest weakness effect on organizational performance. Meanwhile, managers provide various ratings for each of the strengths and weaknesses. Where S1 and S2 are the main strength factors of the business unit while W2, W3, W5, W7, and W9 are considered the main weakness factors of the VID business unit.

From Table 7 the input stages for the IFE matrix in the NDT business unit, it is known that the highest weighting on the strength factor is accepted by S1 and S5 as the most important factor that shows the relative importance of these factors for success in the company's industry. As for the weakness factor, the highest weight was accepted by W7 as the factor that was considered to have the greatest weakness effect on organizational performance.

From Table 8 the input stages for the IFE matrix in the business unit. these factors are for success in the corporate industry. As for the weakness factor, the highest weight is accepted by W1 and W2 as the factor that is considered to have the greatest weakness effect on organizational performance.

C. Internal External Matrix (Matching Stage)

In this study, the IE matrix is formulated by bringing together the coordinate points of the total weighted score obtained from the IFE and EFE matrices. Then the four points are represented by a pie chart that shows the contribution of each business unit to the percentage of sales and profit achievement. Figure 2 shown the IE Matrix for the inspection business units;

It can be seen from the position of each company business unit that the business unit is in cell number 2 and cell number 5. For cell number 2 is occupied by NDT and OCTG business units, which means that the business unit is in a grow and build position where the recommended strategy is an effort which is more intensive or integrated, could be by penetrating deeper into the market, developing products, or expanding market reach. Meanwhile, the SID and VID business units are in cell number 5 which means they are in a hold and maintain position where the recommended strategy is to maintain current market penetration or with product development efforts.

D. SWOT Matrix (Matching Stage)

At present, companies are faced with several problems that they get as a result of a SWOT analysis, where the presence of these problems is in an aggressive strategic area, confirmed in the QSPM matrix, entering and capturing a wider market is a top priority [13]. The Strengths-Weaknesses-Opportunities-Threats (SWOT) Matrix or Strengths-Weakness-Opportunities-Threats (SWOT) is an essential

matching tool that helps managers develop four types of strategies: strengths-opportunities (SO) strategies, Weaknesses strategies opportunities (WO) or weakness-opportunities, Strategy strengths-threats (ST) or strength-threats, and Strategies of weaknesses-threats (WT) or weaknesses-threats [5]. Figure 3 shown the SWOT Matrix analysis of inspection companies.

In this study, managers are interested in combining IE Matrix and SWOT as their guide to determine follow-up in the decision-making process for the chosen strategy. The managerial implication through the merger process is that managers are assisted in determining what strategic steps to take, whether aggressive, competitive, conservative, or defensive with the consideration of the position of business units in the IE matrix helping them as guidance on whether their business units are in a growing and growing position. build, hold and maintain or harvest and divest. Which will then be elaborated with alternatives that emerge through SWOT.

E. QSPM Matrix

In this study, the QSPM matrix was developed with 6 steps. The first step is to list the internal and external key factors. Enter weights identical to IFE and EFE. The third step is to evaluate and then choose an alternative strategy that will be considered to be executed by the company, placing it at the top of the QSPM matrix. The next step gives AS (Attractiveness Scores) of 1-4 and it should be noted that it is not permissible to enter the same value for each strategy in the same row. Score 1 = not attractive, score 2 = quite attractive, score 3 = attractive, score 4 = very attractive. The fifth step is to multiply the factor weight with the AS value of each alternative strategy option to obtain the total attractiveness score / TAS (Total Attractiveness Scores). The higher the TAS value, the more attractive the alternative strategy is. Then the final step is to add up all the TAS values to get the STAS (Sum Total Attractiveness Scores) value. A higher STAS value than one strategy alternative to another indicates which strategy is more attractive to run. The decision to carry out the chosen strategy still has to consider internal and external factors that may influence decision making. As explained in the research method, two strategies were selected as the most relevant and most urgent candidates to run, and finally the two strategy candidates were analyzed the QSPM matrix to get the highest value from STAS, the strategy with the highest score became a priority for managers to be implemented immediately.

The alternative strategies that are considered to be chosen by managers are formulated in Table 9 for later analysis using the QSPM martix. The consideration of choosing two alternative strategies is to make it easier for managers to choose the most relevant alternative with the highest STAS value that is most likely to run. The highest STAS score is an alternative strategy that is considered to have the best Attractiveness Score. Like other strategy formulation analysis tools, the determination of strategic alternatives is based on good intuitive reasoning and can be executed (Table 10).

IV. CONCLUSION

Based on the strategy formulation carried out on the four inspection business units of the inspection company through three stages of analysis, it can be concluded that the chosen strategy in the QSPM that can be carried out by the SID business unit is to reduce product prices by up to 5% to increase the opportunity for additional sales volume. Then for the VID business unit the chosen strategy in the QSPM that can be carried out by the VID business unit is to open opportunities to partner or form a consortium with competitors, especially in large tenders with a complex scope of work. As for the NDT business unit, the strategy chosen in the QSPM that could be carried out by the NDT business unit was to open opportunities for acquisitions, partnerships or consortia with advanced NDT startup companies with "specialty services" in large tenders and complex SOWs. For example, with the NDT Rope Access Technique, UAV Inspection Technique or with other NDT start-ups that only have 1 or 2 methods, market potential is open and has special advantages. And finally, the strategy chosen in QSPM that can be carried out by the OCTG business unit is to increase product prices by 5-10% and carry out direct project cost efficiency to increase the percentage of profit.

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