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Internal and External Assessment for Cyber Defense Platform Startup

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Abstract

This research paper has the main objective to study internal and external assessment proposed by Porter. Data collection was conducted by identifying the strengths, weaknesses, opportunities and threats of the company. Then perform weighting of internal and external factors for the company. The data is then processed using IFE (Internal Factor Assessment) and EFE (External Factor Assessment). Based on the result of the study, it was found that the company of testing and calibration service in Indonesia implementation of Internal and external assessment in cyber defense paltform calculation of the IFE Matrix and EFE Matrix values, the conclusion of the analysis is that the IFE Matrix value is 2.35 and EFE Matrix value is 2.15, when mapped to the Internal and External Matrix, quadrant V (stability zone) will be obtained. Quadrant V means that it is best controlled with an out-and-out strategy. The strategies commonly used are market penetration and product development strategies.

Keywords
SWOT, IFE, EFE, Cyber Defense, Technology

1. Introduction
Technology rapidly evolving significantly over time. In this information era, technology plays a very important role in various aspects of life, whether organizational, business, educational, or individual. One of the developments in technology and information is the Internet. With the internet, it is easier for people to access various information and connect in cyberspace. According to Internet World Stats data, internet users in Indonesia reached 212,354,070 out of a total population of 278,268,685. Unconsciously, the technology that we use every day can turn into a threat in itself. According to Security Intelligence, in the last 30 days there were 96,432,263 devices in the world that experienced malware encounters, with 3,223,067 devices from Indonesia. Several challenges related to cyber threats require more attention to develop cyber security stronger. Cyber security includes practices and actions to protect network ecosystems, corporate assets, and users from malicious attacks aimed at compromising the confidentiality, integrity, and availability of information or data (Fischer 2009).

Rapid changes to consumer needs and product diversity make market conditions more competitive. Every country in the world competes to be the most competitive economy by increasing competitiveness to survive in the era of globalization so that the nation's competitiveness becomes an important point for all countries in the world (Wibowo and Nurcahyo 2020). Responding to the many issues regarding cyber security, one of the SOEs in Indonesia which is engaged in inspection, testing and certification services provides solutions in the type of CSOC security service (Cyber Security Operations Center), cooperating with one of a Developer Company based in France. The service includes monitoring or managing Firewall/Intrusion Prevention Systems (IPSs), managing or manage Intrusion Detection System (IDSs), Distributed Denial of Services (DDoS) protection, manage Unified Threat Management (UTM), manage Secure Messaging Gateways, manage Secure Web Gateways, Security Information and Event Management (SIEM), monitor Network management vulnerabilities, servers, databases or applications, security vulnerability or threat notification services, log management and analysis, and managed device-related reporting and incident response.

This paper will discuss the analysis of cyber defense platform business feasibility using SWOT analysis, Industry analysis of External Factor Evaluation (EFE), and Internal Factor Evaluation (IFE). SWOT analysis is used to evaluate the strategy of the overall strengths, weaknesses, threats, and opportunities of a business or organization (Kotler and Amstrong 2008). SWOT analysis also involves identifying internal and external factors that support and do not support the assessment or improvement of a business or organization (Piton, Nurcahyo and Farizal, 2021). The EFE matrix is used to evaluate the external aspects of the economy, social, politics, government, law and technology. The IFE matrix to evaluate the internal aspects of the company (David, 2011). Scores range from 1 to 4 for each external & internal factor show how effective the company's current strategy is in addressing these

factors, where 1 = poor response, 2 = average response, 3 = above-average response, and 4 = better response (Aeni et al. 2021). The results of these methods can be used to improve competitiveness and business growth.

1.1 Objectives
Seeing many cyber threats that will affect network security in Indonesia, this paper will discuss SWOT analysis, external and internal factors of business feasibility in a company that is engaged in inspection, testing and certification.

2. Literature Review
2.1 Cyber Security
Cyber Security is defined as the prevention and mitigation of malicious intrusion into digital devices and networks, is an important competitive venue for digitized politics, especially in uncertain and disruptive situations (Hassib and Shires 2021).

The threat that cyber security may pose to national and international security has been extensively explored, for example, the social risks and the impacts that response to this may have on freedom and the threats to state power associated with cyber security risk (Da Silva 2022).

2.2 SWOT
SWOT analysis consists of internal and external environmental analysis. The internal environment includes strengths and weaknesses, while the external environment includes opportunities and threats (Kotler, 2000). According to David (2011), the Strengths-Weaknesses-Opportunities-Threats (SWOT) Matrix is one of the important tools in helping companies develop 4 types of strategies, including: SO (strengths-opportunities) Strategy, WO (weaknesses-opportunities) Strategy, ST (strengths-threats) Strategy, and WT (weaknesses-threats) Strategy. The output from a SWOT analysis is highly actionable. It helps managers discover relevant issues and problems, and it has useful attention-directing effects. Also, it can be useful to propose solutions and to stake out a course (Madsen and Stenheim 2021)

2.3 External Factor Evaluation (EFE)
External Factor Evaluation (EFE) Matrix is a tool of strategy formulation used to evaluate the opportunities and threats. In addition, strategies for evaluating information. Information regarding the economic, social, cultural, demographic, environmental, political, government, legal, technology and competition (David, 2011). Each study is not in its value as evidence without the gap. There are many external forces in organization that can be divided into five broad categories; (1) economic force, (2) social, demographic, environmental, (SCDE) force, (3) political, governmental, and legal forces, (4) technological forces, and (5) competitive forces. In analyzing industry, the EFE matrix is used to determine the magnitude of influence of the company's external factors and describe the company's condition in opportunities and threats which are calculated on ratings and weights. The EFE matrix can be developed into 5 steps, (1) List 15-20 key external factors, including both opportunities and threats that affect the company or industry. (2) Assign or allocate each factor a weight from 0.0 to 1.0. (3) Rate the effectiveness of current strategies between 1-4 to each key external factor, where 1= the response is poor, 2= the response is average, 3= the response is above average, and 4 = the response is superior. (4) Multiply the weight and rating to determine the weighted score. (5) Sum the weighted scores (David 2011).

2.4 Internal Factor Evaluation (IFE)
Internal Factor Evaluation (IFE) Matrix is a tool of strategy formulation used to evaluate the strengths and weaknesses. In addition it has also become a platform to identify the relationship between the two. Intuitive judgments used in the development of IFE matrix (David 2011). The results of the analysis should not be valued as evidence without the gap. The IFE matrix can be developed in 5 steps, (1) List 10-20 key internal factors as identified in the internal audit process, including both strengths and weaknesses. (2) Assign a weight that ranges from 0.0 (not important) to 1.0 (important) to each factor. (3) Assign a 1-4 rating to each factor to indicate whether that factor represents a strength or weakness. (4) Multiply each factor's weight by its rating to determine a weighted score for each variable. (5) Sum the weighted scores (David 2011).

3. Methods
In this study, data collection was conducted by identifying the strengths, weaknesses, opportunities and threats of the company. Then perform weighting of internal and external factors for the company. The data is then processed

using IFE (Internal Factor Assessment) and EFE (External Factor Assessment). Calculating the IFE Matrix and EFE Matrix values determines the score for each element and gives the weight value. Then using the weight values to determine the position of the company in the internal and external evaluation matrix.

4. Data Collection

Data collected from the cyber defense platform business development portfolio report to perform SWOT analysis. Primary data came from brainstorming activities, asking several questions, and interviews with people involved in the cyber defense platform's business development process. While the secondary data was obtained from company portfolio reports.

5. Results and Discussion

In the process of developing a cyber defense platform business, SWOT Analysis is performed to identify and develop strategies for building the business based on four factors, Strength, Weakness, Opportunity, and Threat. The SWOT Analysis for Cyber Defense Platform of the SOEs in Indonesia were obtained by in-depth interviews with people that were involved in the cyber defense platform's business development process. Table 1 below shows the SWOT analysis in cyber defense platform in one of the SOEs in Indonesia.

Table 1. SWOT Analysis Cyber Defense Platform One of the SOEs in Indonesia

Strength	**Weakness**
1. One of the SOEs in Indonesia	1. No readiness of the internal organization that is responsible for the services to be performed
2. Have loyal customers	2. Few resources are suffice for the execution of operations
3. Have a strong brand image	3. Few trained human resources
4. Partnering with multinational companies that have the best CSOC technology	4. Company does not have full control over the platform it owns
Opportunity	**Threat**
1. Improve resource competencies	1. Many competitors in similar services
2. Have cooperation support	2. Many superior competitors in CSOC
3. Opportunity to expand market overseas	3. Force majeure
4. Utilization of SOE synergy program	4. Developer has not been registered in Indonesia National Cyber and Crypto Agency

IFE Matrix analysis is used to find out how big the role of internal factors is in a company. The IFE Matrix shows the internal state of a company in the form of strengths and weaknesses. These are calculated using ratings and weights. The weights and ratings of the IFE Matrix are obtained from in-depth interviews with people that were involved in the cyber defense platform's business development process.

Table 2. Internal Factor Evaluation (IFE) Analysis

No	Factor	Weight	Rating	Score
STRENGTH		**0.5**		**1.6**
1	One of the SOEs in Indonesia	0.1	2	0.2
2	Have loyal customers	0.1	2	0.2
3	Have a strong brand image	0.2	4	0.8
4	Partnering with multinational companies that have the best CSOC technology	0.1	4	0.4
WEAKNESS		**0.5**		**0.75**
1	No readiness of the internal organization that is responsible for the services to be performed Few resources are suffice for the execution of operations	0.1	1	0.1
2	Few resources are suffice for the execution of operations	0.15	1	0.15
3	Few trained human resources	0.15	2	0.3
4	Company does not have full control over the platform it owns	0.1	2	0.2
IFE Total Weighted Scores		**2.35**		

EFE Matrix is used to determine the extent of the impact of external factors in the company. The EFE Matrix describes the conditions of a company's opportunities and threats and is calculated using ratings and weights. The weights and ratings of the IFE Matrix are obtained from in-depth interviews with people that were involved in the cyber defense platform's business development process.

Table 3. External Factor Evaluation (EFE) Analysis

No	Factor	Weight	Rating	Score
OPPORTUNITY		**0.5**		**1.4**
1	Improve resource competencies	0.1	2	0.2
2	Have cooperation support	0.05	2	0.1
3	Opportunity to expand market overseas	0.2	4	0.8
4	Utilization of SOE synergy program	0.15	2	0.3
THREATS		**0.5**		**0.75**
1	Many competitors in similar services	0.15	1	0.15
2	Many superior competitors in CSOC	0.15	2	0.3
3	Force majeure	0.1	2	0.2
4	Developer has not been registered in Indonesia National Cyber and Crypto Agency	0.1	1	0.1
EFE Total Weighted Scores		**2.15**		

From the results of the calculation of the IFE Matrix and EFE matrix on Table 2 and Table 3, the following results are obtained, strength with a value of 1.6, weakness with a value of 0.75, opportunity with a value of 1.4, and threat with a value of 0.75. The total of IFE Matrix and EFE Matrix score can represent the business position in a company or industry.

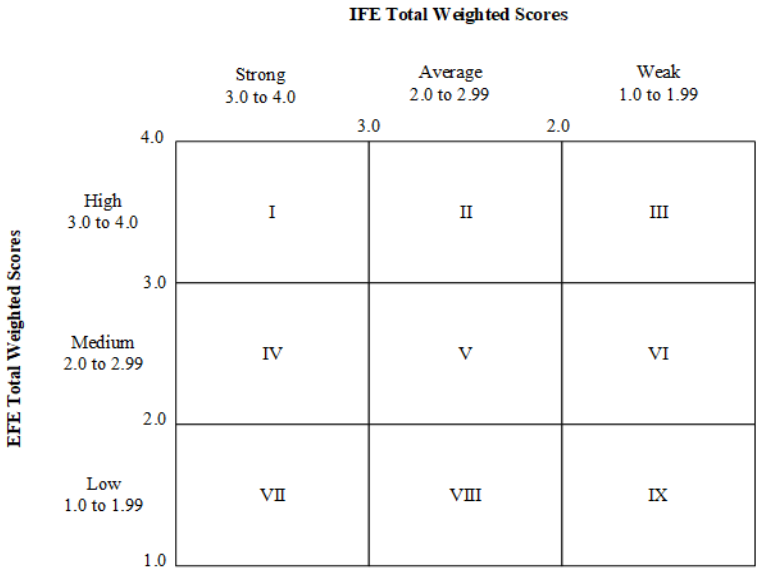

Figure 1. The Internal and External (IE) Matrix.

The IE Matrix is divided into 3 major regions that have different strategy implications, there are (1) Quadrant I, II, or IV can be described as *grow and build*, which means the company or industry can use Intensive (Market Penetration, Market Development or Product Development) or Integrative (Backward Integration, Forward Integration, and Horizontal Integration) strategy. (2) Quadrant III, V, or VII can be described as *hold and maintain,*

company or industry can use Market Penetration or Product Development strategy. (3) Quadrant VI, VIII, or IX is *harvest or divest,* company or industry can use Retrenchment or Divestiture strategy (David, 2011).

Based on the analysis in Table 2. Internal Factor Evaluation (IFE) Matrix and Table 3 External Factor Evaluation (EFE) Matrix, Table 4 below shows the score of each factor of the SWOT Analysis.

Table 4. Score of Each Factor of the SWOT Analysis

Factor	Score
Strength	1.6
Weakness	0.75
Opportunity	1.4
Threats	0.75

Based on the calculations in Table 4, the strength score is higher than the weakness score with a difference (+) 0.85 and the opportunity score is higher than the threats score with a difference (+) 0.65. Figure 2 shows the SWOT diagram result of the identification of each factor.

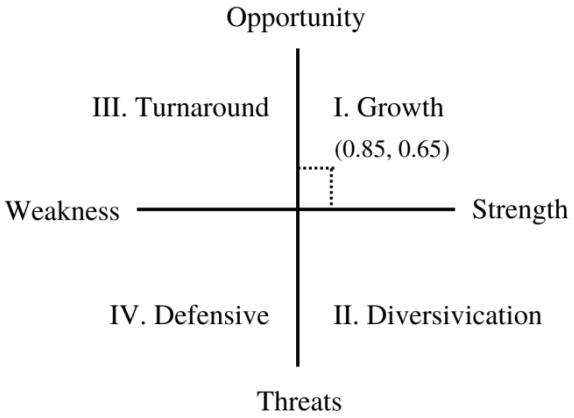

Figure 2. SWOT Diagram

Based on the SWOT diagram in Figure 2, the process of developing a cyber defense platform business is in quadrant I, which means it is profitable. Business processes have opportunities and strengths so they can take advantage of existing opportunities. The strategy that must be set in this condition is to support a growth oriented strategy policy.

6. Conclusion

Based on the calculation of the IFE Matrix and EFE Matrix values, the conclusion of the analysis is that the IFE Matrix value is 2.35 and EFE Matrix value is 2.15, so when mapped to the Internal and External Matrix, quadrant V (stability zone) will be obtained. Quadrant V means that it is best controlled with an out-and-out strategy. The strategies commonly used are market penetration and product development strategies.

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Biographies

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