

# Challenges and Opportunities From The Perspective of The Local Industry Players: In The Context of The Malaysian Defence Industry

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## Abstract

Malaysian Defence Industries (MDI) spurred in 1972 with the privatisation of SME Ordnance and AIROD. The government has had a relatively enormous defence allocation to increase the MAF's readiness and resilience of defence. However, the defence industry in Malaysia has experienced various problems and challenges over the past few years. These problems and challenges have negatively impacted the development of the local defence industry, where many new acquisitions for MAF military assets are affected. Therefore, this article aims to identify and analyse the challenges in the local defence industry. The methods used are based on qualitative methodology through semi-structured interviews with prominent personnel directly involved in the national defence industry. Existing literature and official documents on the implementation of the defence industry worldwide are also studied. Content and thematic analysis were applied to analyse, interpret, and group the findings into four themes of challenges: policy direction, implementation, governance and leadership. This article attempts to fill the gap in challenges that arise in implementing the defence industry in Malaysia from the perspective of the government and local defence companies. Also, several recommendations are highlighted to overcome this gap related to the opportunity for industry improvement.

**Keywords:** Defence Industry, Self-Reliance, Challenges, Opportunities.

## Introduction

The driving factor for the Malaysian government to locally industrialise defence is for both non-economic and economic reasons. The Malaysian Defence Industry's principal objective was to create modest but credible defence industrial capability providing first-line logistical support to the Malaysian Armed Forces (MAF) through through-life maintenance, repair and overhaul (MRO) (Balakrishnan, 2008). The need to overcome the arms embargo is a non-

economic reason for developing countries to pursue arms production. Political motives include foreign policy considerations and leveraging military production for regional power recognition. In addition, developing countries have recognised the benefits of building a defence industrial base that supports self-reliant armed forces, further adding to their defence capabilities. From an economic perspective, defence industrialisation is viewed as a catalyst for capacity-building and creating high-value-added products. Other programs promote backward linkages to support industries, dual-use technology, employment, export promotion, and absorption of high-technology and spin-offs to boost the national economy. In Europe's regional countries, cooperative relations in the defence industry have given an advantage to the economy and even succeeded in producing good projects with lower manufacturing costs (Weiss & Biermann, 2018).

Fajil et al. argued that the defence industry for a country could form part of its defence capabilities in maintaining the security and sovereignty of the country (Fajil et al., 2020a). Therefore, a country with a developed defence industry can contribute to the nation's security and, at the same time, grow the nation's socio-economics. In addition, it can also provide support structures and services that significantly affect the operational readiness of its armed forces. He also stated that the main factor in developing the defence industry is a need to reduce dependence on suppliers or producers from foreign countries and as an effort to build the country's defence capabilities towards the principle of self-reliance.

#### *The History of the Defence Industry in Malaysia*

In the 1970s, the government decided to privatise some facilities of the MAF. The primary goal is establishing an indigenous defence industry aligned with the country's aspiration to start an independent defence posture. Concurrently, this strategy supports the country's development of high-tech capabilities. According to Defence Industry Division, SMEO was established in 1972, formerly known as Syarikat Malaysia Explosive, to produce small arms, ammunition and pyrotechnics. The local production of these assets is directly to improve the ability of local companies in the national defence industry (Defence Industry Division, 2021). According to Fajil et al., apart from the establishment of SMEO, the local aerospace company AIROD (Aircraft Inspection, Repair and Overhaul Depot) was established in 1976 specifically to provide MRO services to aircraft belonging to the Royal Malaysian Air Force (RMAF). In addition, the PSD Naval Dockyard at Lumut Naval Base was privatised in 1997, now known as Boustead Naval Shipyard (Fajil et al., 2020a). Establishing these companies marks the beginning and start-up of the development of the defence industry in Malaysia.

Later in 1982, the country introduced the National Industrialization Policy, which encourages the local industry player to perform primary and significant maintenance of MAF's assets and is consistent with the national aspiration to become self-reliant (Defence Industry Division, 2021). The same year, the government introduced the first written framework policy, the National Defence Production Policy (NDPP). This policy was issued as a government approach to develop the local defence industry and achieve the principle of self-reliance (Balakrishnan, 2008). However, the government's efforts to acquire new military assets were interrupted due to the economic recession in the mid-1980s, mainly due to military budget constraints. At that time, the implementation of the NDPP has been wholly abandoned.

Subsequently, the national defence industry continued to make strides by privatising several government-owned companies to become entirely private companies in the 1980s and 1990s. The industry sectors are aerospace, weaponry, maritime and ICT (Balakrishnan, 2008). In addition, the introduction of the Industrial Master Plan in 1986 strived to develop the manufacturing sector in Malaysia by enhancing the diversity and integration of all industrial

sector involvement, significantly expanding the capability of the defence industry (Balakrishnan & Treesna, 2021).

Today, many local companies have acquired the expertise and knowledge to compete for business locally and internationally. Also, the Malaysian government is devoted to enhancing its scientific and economic prowess to increase its competitiveness. The government's policy uses procurement instruments to leverage the economy, industrial benefits and support for further national development through the Industrial Collaboration Program and Offset Program. The macroeconomic framework informs this policy of the Malaysian Five Year Development Plan, the Industrial Master Plan, and the National Science and Technology Policy. The Industrial Collaboration Program and offset program commitments will necessitate a large amount of defence buying under government procurement's current norms and regulations.

#### *The Motivation for the Malaysian Defence Industry*

The defence industry in Malaysia began in the era after Malaya's independence and has since become a national agenda. In the initial phase, the country focused on providing logistics support to the MAF to strengthen military readiness (Defence Industry Division, 2021). However, during that time, the country's industrial development program was poorly in progress as most logistics resources in the MAF still depended on British and a few Chinese companies (Balakrishnan, 2008).

Subsequently, during the Cold War, most countries prioritised and established local defence industries as an effort for deterrence (Balakrishnan & Treesna, 2021). However, at the beginning of the development of Malaysia's defence industry, most of the defence production was only to meet the needs of the MAF. It was a government-led program (Balakrishnan, 2008). Fajil et al. also mentioned that the country's defence industry has minimal capabilities, namely the ability to maintain and repair logistics for the MAF. He continued by saying that the defence industrial base's primary goal is to provide assistance and support MAF in terms of military logistics to make the armed forces self-reliant and focus only on fulfilling the units' needs under MAF's auspices (Fajil et al., 2020a). For example, a local company, namely SME Ordnance, provides requirements for manufacturing weapons and explosives, and AIROD provides logistics requirements to the Royal Malaysian Air Force.

The focus on self-reliance has also been stated in the national defence documents, namely the National Defence Policy (NDP) and the Defence White Paper (DWP), which prioritise developing and strengthening the implementation of the local defence industry. By definition, self-reliance is the ability of the country to develop a well-developed local defence sector, which will reduce the country's reliance on foreign Original Equipment Manufacturers (OEM) and suppliers through strengthening the local defence industry and a sustainable and effective defence science and technology advancement approach (Ministry of Defence, 2010; Ministry of Defence, 2020). Kuah & Loo added that the principle of self-reliance in the defence industry is the ability to adopt an independent defence industry base and reduce dependence on foreign suppliers (Kuah & Loo, 2004). In that sense, Malaysia must rely on its resources and skills to protect its sovereignty, independence, and territorial integrity. Also, the government encourages the local industry player to perform primary and significant maintenance of MAF's assets, consistent with the national aspiration to become self-reliant (Defence Industry Division, 2021). The principle of self-reliance in Malaysia is stated in the NDP and DWP to ensure the need to achieve optimal defence capabilities and high readiness for the MAF. Furthermore, implementing self-reliance in the Malaysian defence industry is crucial, highly relevant, timely right and will inevitably continue for an extended time. The

concept of self-reliance is vital in the defence industry in ensuring that the country's aspirations can develop and produce military products locally and not rely on external assistance.

The strongest motivation for defence industrialisation has been classically realist and security-oriented. It is also argued to be beneficial for national economic development, namely job creation, technology transfer, exports and backward linkages spurring the expansion and modernisation of other industries, for example, steel, machine tools and shipbuilding. In Malaysia's defence industrialisation case, the government initiated the backwards links promoting the development of other industries through the Industrial Master Plan in 1986 (Balakrishnan, 2008; Bitzinger, 2015). Henceforth, it is through the long-term plan of making Malaysia a fully developed nation via Vision 2020 goals by the then Most Honourable Former Prime Minister, Dr Mahathir Mohamad, that technology transfer and offset programs have been introduced in the procurement of defence equipment from foreign countries (Balakrishnan & Matthews, 2009; Sulaiman et al., 2020). With the main objective being to industrialise the defence sector for economic and security purposes, the Malaysian Defence Industry has expanded into other sectors, namely weapons, information and communication technology (ICT), automotive, aerospace and maritime.

In principle, the MAF face various logistics problems (Syed Mustapa et al., 2020). Among the logistics problem identified was a lack of logistics resources, budget constraints, political interference in allocation expenditure, outdated assets, over-reliance on privatisation, procurement that has not met actual needs and low levels of readiness. MAF is also still using ageing military equipment. There is equipment purchased from the last decade, which is from 1970 until 1999, is still in use in the MAF and has gone through the Life Extension Program process to enable the lifespan of an asset to use over a longer time. Among the MAF military assets that are still in use are the Hawk 108 aircraft used by the RMAF, which the government purchased in the 1970s from the United Kingdom, the Malaysian Army with the Condor Armoured Vehicle purchased from Germany in the 1980s, two ships of the Royal Malaysian Navy (RMN), KD Kasturi and KD Lekir, which were also acquired in the mid-1980s. These assets have reached a beyond economic age that some are decades old, and the requirement for maintenance or new procurement requires enormous costs. In this regard, the Ministry of Defence (MOD) needs to take an appropriate approach so that national security is not affected by the problem of obsolete assets that can only show the presence of MAF (show of force) but cannot be used to defend the country. The acquisition of new assets and equipment for MAF is essential to increase its readiness to deal with any security threats, whether traditional or non-traditional.

The development of the defence industry can provide benefits and advantages to a country's armed forces, especially for developing military assets and efforts to defend the country's sovereignty. According to Fajil et al., with a developed and highly competitive defence industry, the procurement and manufacturing of new military assets enable threats to the country to be addressed (Fajil et al., 2020a). Apart from the procurement and manufacturing of new assets, the Malaysian defence industry has progressed from carrying out mere MRO (Maintenance, Repair, Overhaul) type of work to more sophisticated jobs involving design, manufacturing, and sub-assemblies through the life support program in various sectors including aerospace, maritime, automotive and ICT (Othman et al., 2018). In the end, the national defence industry can help to overcome various logistics challenges in the MAF and maintain national security by acquiring new assets and maintaining available equipment that

can provide all the MAF services with a high level of readiness to deal with any threats to the country (Fajil et al., 2020b).

### Objectives

Based on the issues faced in this research, the objectives of this paper are as follows:

- Attempts to fill the gap and identify the challenges that arise in implementing the defence industry in Malaysia from the perspective of the government and local defence companies.
- Also, several recommendations are highlighted to overcome this gap that can be implemented by the government and local defence industry companies to improve the execution of the Malaysian defence industry in the future.

### Materials and Methods

This study uses a qualitative methodology through a semi-structured interview with prominent personnel directly involved in the national defence industry. These personnel were selected to be the research participant for this study based on their extensive experience of involvement in the Malaysian defence industry. The selection of companies is based on their capabilities, 4-star star rating (based on technical audits carried out under the Malaysian Industry Council for Defence, Enforcement and Security (MIDES)) and prominence in the local defence industry. In addition, these companies have their capabilities for the industry sector and are involved in one or more industry segments to stimulate the growth of the local industry. The industry segments are automotive, aerospace, weaponry, maritime, ICT or common user items. Hence, the author identified and interviewed 21 prominent personnel in the local defence industry, where ten of them hold significant positions in various government agencies related to the development of defence, defence finance, defence R&D, defence logistics in MAF, policy, science advisor to the Prime Minister and academician from a local university. In addition, 11 personnel from the local defence companies hold leading positions in the company. These companies provide maintenance support and supply military equipment for MAF in six main equipment categories: automotive, maritime, aerospace, weaponry, Information and Communication Technology (ICT) and common-use assets. A summary of the background and experience of the research participants involved in this study is shown in Table 1 below.

Table 1.

#### *Research Participant Information*

Ser.	Research Participant	Organisation	Working Experience
1.	Research Participant 1 (RP 1)	Ministry of Defence	Holds various government positions related to the development of defence
2.	Research Participant 2 (RP 2)	Ministry of Defence	Holds various government positions related to defence finance
3.	Research Participant 3 (RP 3)	Ministry of Defence	Holds various government positions related to defence R&D

4.	Research Participant 4 (RP 4)	Malaysian Forces	Armed	Holds various government positions related to defence logistics in MAF
5.	Research Participant 5 (RP 5)	Malaysian Forces	Armed	Holds various government positions related to defence logistics in MAF
6.	Research Participant 6 (RP 6)	Malaysian Forces	Armed	Holds various government positions related to defence logistics in MAF
7.	Research Participant 7 (RP 7)	Malaysian Forces	Armed	Holds various government positions related to defence logistics in MAF
8.	Research Participant 8 (RP 8)	Government Agency		Holds various government positions related to policy
9.	Research Participant 9 (RP 9)	Public-Private Partnership Organization		Act as Science Advisor to the Prime Minister
10.	Research Participant 10 (RP 10)	Local University		Responsible for managing matters under industry relations and corporate affairs and providing a service to stakeholder's needs
11.	Research Participant 11 (RP 11)	Local Defence Company		Provide maintenance support and supply military equipment for MAF, primarily for weaponry and automotive sectors
12.	Research Participant 12 (RP 12)	Local Defence Company		Provide maintenance support and supply military equipment for MAF, primarily for aerospace sectors
13.	Research Participant 13 (RP 13)	Local Defence Company		Provide maintenance support and supply military equipment for MAF, primarily for maritime, aerospace, weaponry and common-use sectors
14.	Research Participant 14 (RP 14)	Local Defence Company		Provide maintenance support and supply military equipment for MAF, primarily for maritime and weaponry sectors
15.	Research Participant 15 (RP 15)	Local Defence Company		Provide maintenance support and supply military equipment for MAF, primarily for

			automotive and aerospace sectors
16.	Research Participant 16 (RP 16)	Local Defence Company	Provide maintenance support and supply military equipment for MAF, primarily for aerospace and maritime sectors
17.	Research Participant 17 (RP 17)	Local Defence Company	Provide maintenance support and supply military equipment for MAF, primarily for maritime sectors
18.	Research Participant 18 (RP 18)	Local Defence Company	Provide maintenance support and supply military equipment for MAF, primarily for automotive and common-use sectors
19.	Research Participant 19 (RP 19)	Local Defence Company	Provide maintenance support and supply military equipment for MAF, primarily for maritime sectors
20.	Research Participant 20 (RP 20)	Local Defence Company	Provide maintenance support and supply military equipment for MAF, primarily for automotive, maritime, ICT and common-use sectors
21.	Research Participant 21 (RP 21)	Local Defence Company	Provide maintenance support and supply military equipment for MAF, primarily for ICT and maritime sectors

According to Saunders & Townsend, the recommended number of research participants suitable for an interview for a qualitative study is between 15 to 60 people. However, the actual number depends on the purpose of the research, the importance of the data and the epistemological and ontological position of the researcher (Saunders & Townsend, 2016). Therefore, the number of research participants involved in the study is appropriate and sufficient.

A semi-structured interview was conducted using research questions the researcher had prepared. Permission to conduct an interview was requested from the research participant involved by signing a Consent Form. The interview session was held in Malay and English and was recorded using a recording device. The recorded interview is then transcribed and analysed through thematic analysis to generate initial codes and categorise them into themes. The list of general questions for the interview held is as follows. However, the research participants can freely express their opinions on the discussed topic.

1. Background of Research Participant.
2. Challenges on Government Roles and Direction, including related policy and procedure.
3. Challenges on MAF readiness and capability.
4. Challenges on Defence Budget and Allocation.

5. Challenges on Human Capital Development.
6. Challenges on Technology Development.
7. Challenges on Industrial Development.
8. Challenges to achieving Self-Reliance.
9. Challenges on the Market, either local or abroad.
10. Challenges on Government Leadership.
11. Challenges on Collaboration.
12. Suggestions to overcome the challenges and opportunities for improvement of the industry.

This research used secondary data collection methods through relevant government documents such as the NDP, the DWP, the MOD Annual Report from 2010 until 2021 and literature studies concerning the defence industry, local or abroad. Content and thematic analysis were applied to study, interpret, and group the findings of the interviews, literature, and related documents to identify the possible relationship between the challenges.

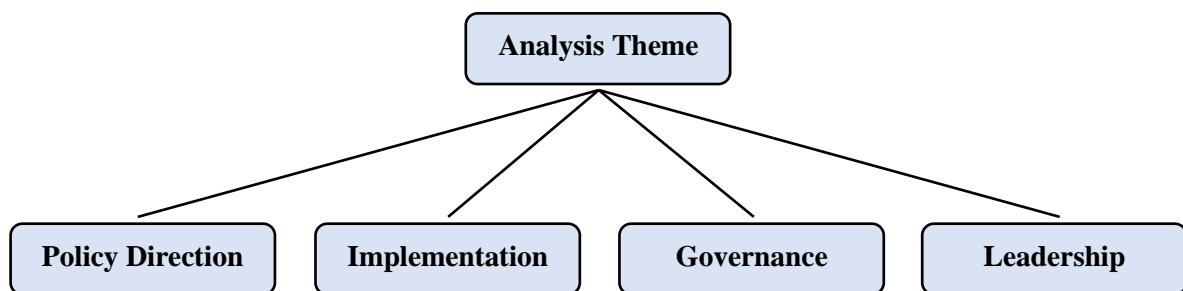
### **Findings and Discussion**

There was past research done that has provided some essential points to describe the challenges faced in the defence industry in Malaysia. Othman et al. stated that foreign companies have several advantages over local companies because they have been in this industry since then and have dominated the market. He also argued on the lack of technological development in terms of limited research and development activities (R&D), lack of efficiency in human capital and the need for high investment capital for such development. Also, the market potential for local indigenous products in domestic or international markets is limited. Although the government implemented offset programmes, the programme's efficiency is still relatively low (Othman et al., 2019). Several researchers have also debated the challenges arising from the offset programme. Sulaiman et al. argued on the offset programme's inability to provide local workers with employment opportunities, the OEM's asserting intellectual property rights and determining whether contractual obligations have been fully met. This situation occurs due to the challenge of proving that counter-purchase contracts have contributed to existing commodities sales (Sulaiman et al., 2020). In addition, the capabilities of the national defence industry are limited to maintenance, repair and overhaul (MRO) activities due to OEMs being reluctant to transfer their technology to local companies.

Due to procuring these defence assets in multiple countries, MAF also faces various problems in the technical and logistical aspects of purchased equipment. Defence assets from different countries certainly have different standards and technical specifications. As stated by Othman et al., R&D in the industry was still minimal due to the failure of offset programs to promote any initiative for that purpose. Balakrishnan & Treesna argued that the lack of strategic approach in the acquisition of defence assets where even though MAF and all its services have strategic policies (4DMAF, Army4NextGen (The Army), 15 To 5 Transformation Plan (RMN) and CAP55 (RMAF)), as most of the procurement activities made only have minimal involvement and input by local companies. Second, local companies cannot absorb industrial technology and are highly dependent on OEM imported products. Third, there was also lacked a strategic relationship between local companies and foreign partners which can result in many problems in supplying military products to MAF (Balakrishnan & Treesna, 2021). Finally, the R&D challenge is where there is a lack of funding to generate innovation in the local defence industry environment.



Apart from the challenges mentioned above, based on the interviews conducted with the identified research participants with extensive experience with direct involvement in the local defence industries, this paper attempts to identify the significant challenges impacting the industry's growth from the perspective of the local players. The challenges identified are from the perspective and views of government officials from the related agencies and prominent top officers from the defence companies. The results were analysed using a thematic analysis approach to categorise and cluster the findings per Figure 1 below.



**Figure 1.** The Analysis Theme of the Defence Industry Challenges (Source: Author)

### Policy Direction

The government introduced the NDP in 2010 and the DWP in 2020. NDP and DWP documents emphasise self-reliance, prioritising results from the local defence industry and defence technology science. Despite the underlying significance of self-reliance in the local defence industry, the content of the policy is not very convincing as it is too generic and unclear. NDP outlined principles of self-reliance, but it is only a policy document without a specific strategic plan. The same goes for DWP, which is also seen as a public policy document without clear measures to achieve the national objectives, particularly in the defence industry. Several research participants argued that DWP is a generic policy document that illustrates the government's direction but without detailed action. The policy should be more objectified with a strategic action plan of a short-term and long-term target of 10 years, 20 years, or 30 years. The policy should also clearly define MAF's plans for future procurement for the industry to be prepared accordingly to actualise the vision together.

*"...The country has no power source for the defence industry."*

(RP11, 2022)

*"...No definitive power source exists in the national defence industry."*

(RP17, 2022)

Both research participants agreed that Malaysia does not have a source of power for the players in the national defence industry to follow and be used as a guide. Therefore, the local company does not have a benchmark to determine how far they have gone unless there are indicators, targets or Key Performance Indicators (KPIs) stated in the DWP that must be achieved yearly for performance in the national defence industry. In addition, the aspiration of DWP and the current structure are not aligned. So, it is challenging for the Chief of the Defence Force and all Service Chiefs in the MAF to change the structure. While in terms of implementation, there is no comprehensive action plan in terms of budget, procurement, asset capability, development and other things related to the development of MAF. Furthermore, each MAF service has its strategic plan, but it is not translated into a master plan that includes MAF development planning for the short and long-term strategy.

*“...There are indeed strategic plans for every service in MAF, such as Army4NextG (MA), Transformation Plan 15 to 5 (RMN) and CAP 55 (RMAF), but there are no milestone targeted details for five years, ten years, or plan phase 1, phase 2 and so on.”*

(RP 14, 2022)

*“...Although MOD have strategic planning for all services, there is still a missing master plan on overall focus.”*

(RP 8, 2022).

Amid the turmoil in Malaysia's political landscape since 2018, the political instability has called into question policy continuity. Given that the DWP was commissioned during the previous administration, there were concerns that it might have political influence. However, RP 12 emphasises that the implementation of DWP will continue. However, RP 20 also says that the government's efforts for the local defence industry to achieve self-reliance are still insufficient, and the current policy needs to be streamlined and improved.

*“...I believe that the new government will allay concerns when they confirm their commitment to continue implementing the DWP.”*

(RP 12, 2022)

*“...The efforts from the government are not enough at this point. As stated earlier, policy needs to be revisited, reviewed, and changed to achieve self-reliance in the defence, security, and enforcement industry.”*

(RP 20, 2022)

As the primary user of the industry, MAF must be compellingly clear of their requirement. Among the intangible factors in national power are strategic purpose and national will. Military power is one of the sources of national power. Therefore, MAF must affirm their intent and focus and perhaps have a clear heading. Countries with constant threats and challenges to their security, such as the United States, Russia, South Korea, India and Pakistan, have a higher percentage of GDP for defence spending to enhance their military capability. Therefore, although Malaysia's geopolitical condition is more stable, MAF readiness must not be compromised.

Hence, the government must have a clear and firm directive regarding the policy for using national indigenous products and identify the areas the industry wants to create and focus on. Consequently, the strategic policy must then be objectified with clear action plans. What is essential is that the policy should be clearly stated, recognised as a source of power and agreed upon by all stakeholders. Local companies expect a specific policy to be implemented in the local defence industry. The policy must be implemented correctly and effectively in every agency involved to accomplish the country's aspirations to achieve self-reliance.

*“...We, as a local company, want to move forward with this policy.”*

(RP 16, 2022)

*“...The direction of this policy must come from the top to the lower level and be discussed with all parties involved. Ultimately, the industry must grow towards becoming self-reliant.”*

(RP 21, 2022)

From the finding on the theme of policy direction, a clear and transparent defence industrial policy are significant to ensure the country's aspiration to develop the industry capabilities the way they wanted and chose. This finding exemplifies the United Kingdom House of Commons Defence Committee report, which stated that the published defence industrial strategy provides greater transparency on their defence requirements, especially explaining more clearly how the procurement of military assets or system decisions are made. This

strategy also emphasises that the spending priorities are set and will not be changed over time with any circumstances or interference in plans (Ministry of Defence: UK, 2006).

## Implementation

### *Government support*

Support and assistance from the government are crucial and essential for developing the local defence industry to be realised in line with the country's aspiration towards self-reliance. However, the support and assistance shown by the government are not entirely directed towards the aspiration.

*"...I remember that in 1996, a local company made a weapon system locally and conducted its R&D, namely the Atlas Squadron company in Lumut. However, the government did not even procure the system. Instead, the government procured a similar system from a company in France."*

(RP 17, 2022)

Furthermore, instead of providing local companies with a platform for developing an indigenous product, the governments are more interested in war-proven products, particularly from foreign manufacturers.

*"...It is understandable how end-users tend to be more interested and selective on war-proven products."*

(RP 3, 2022).

The government must have faith in local companies' capabilities and not be bound by the perception that blue eyes (western) are better. The local company are struggling to prove their trustworthiness with respect to Western companies that are already established and far more advanced in their technology. Even Western countries used most of their respective country's defence products entirely before being exported to neighbouring countries and promoted globally.

*"...My company is struggling to obtain confidence from the government as our product is locally-made, unlike their global buyers, who are willing to procure their product even if it is not war-proven."*

(RP 18, 2022)

RP 20 added that using local products by the country's armed forces is essential and will be used as product references for other countries interested in buying and using them.

*"...The potential buyer from the international market will tend to refer to product references, and most local products have no references because MAF does not use or have confidence in local products."*

(RP 20, 2022)

The government should encourage novice product trials as a prerequisite to success and perfection, thus supporting local industry.

*"...To have a developed industry, the government must be more supportive with a mindset to develop and improve rather than demotivate the local industry with their unsuccessful attempts."*

(RP 15, 2022)

In addition, the development of local products should be guided by military doctrine and not based on contractor driven. Pertinent to this issue is the development of defence capability planning must be based on doctrinal drives outlined by MAF based on their capital asset requirement.

*"...With respect to products specification, I argued that projects developed by STRIDE must strictly follow the military doctrine. The STRIDE and the industry cannot execute production without adhering to the MAF's doctrine and specific requirements. As an example of a drone asset, does the MAF military doctrine allow installing a weapon system on this equipment?"*  
(RP 3, 2022)

*"...In reality, however, asset procurement is often based on specifications from contractors instead of initial requirements based on the proposed concept and doctrine of MAF."*  
(RP 4, 2022)

In the end, the government should have demonstrated their support and trust to the local companies for them to grow continuously. But unfortunately, failures are common, and achieving perfection is not a one-day effort, particularly in the defence industry, as it involves complex technology.

### *Bureaucracy issues*

Bureaucracy was always related to the government administration process. This state mainly takes place in the Ministry of Defence procurement process. The company has to apply for approval concerning executing R&D in the interest of national defence. However, bureaucratic issues have made the process take long and challenging to finish.

*"...I faced various bureaucracies in the procurement process. There is no fast lane, and the requirement to go through the procurement process from one step to another is strenuous. For instance, there were cases where the company faced weeks of delay due to bureaucracy in obtaining approval from the local authority for the firing test to be conducted. However, the company still faced bureaucratic hassle from numerous local authorities to obtain approval"*.

(RP 11, 2022)

This statement was also supported by RP 12 and RP 18, who stated,

*"... I would like to see a cut in bureaucracy. The process of getting a contract is not straightforward. Many layers are involved in the government procurement process, creating an unnecessary hassle and inconvenience for the company"*.

(RP 12, 2022)

*"..... I faced challenges to being facilitated by several government agencies in charge of marketing their product globally. These agencies will only provide support based on a scale of revenue impact, which they will only acquire once their product has been marketed globally. Pertinent to global marketing, the companies required government agencies to support them in the promotional programme to obtain the trust of the global market. My company also faced numerous layers of bureaucracy for the tax exemption application, which needed to go to the Inland Revenue Board of Malaysia (IRBM) and later to the MOF Taxation Division"*.

(RP 18, 2022)

On the other hand, there were also transparency issues faced by the contractor, who thought the document submitted was manipulated.

*"...The tender documents could be manipulated to benefit the designated company for the contract award. For example, the Schedule of Compliance (SOC) and GSR (General Specification Requirement), which are requirements for government tenders, can be planted by a particular company."*

(RP 20, 2022).

Therefore, looking at the issues concerning the government process, many reports related to bureaucracy and transparency slow the procurement process. The government should have

demonstrated their support to encourage the company instead of frustrating them with the bureaucracy layers. Procedures are necessary, but the government must facilitate instead of frustrating the industry to boost the industry.

#### *Plaguing budgeting and funding for defence*

Malaysia's government's budget for defence is relatively low compared to other countries (Singapore and Indonesia). However, for the past decade, an average of MYR 3 billion were allocated for MOD's development expenditure (DE). Details of the development expenditure for equipment procurement are in Table 2 below.

Table 2.

*Development Expenditure (DE) Budget of the Ministry of Defence for the Equipment Procurement of Malaysian Armed Forces (Ministry of Defence, 2021)*

Year	Overall Budget (MYR Billion)	DE Equipment Procurement Budget (MYR Billion)	%
2010	2.04	1.68	82.35
2011	3.29	2.86	86.93
2012	2.76	2.61	94.57
2013	3.28	3.14	95.73
2014	3.15	2.98	94.60
2015	3.61	3.35	92.80
2016	3.57	3.17	88.80
2017	3.63	2.92	80.39
2018	3.08	2.93	95.13
2019	2.90	2.32	80.00
2020	3.75	3.25	86.51
2021	4.16	3.67	88.22

*"...I believed that the industry players understand the budget limitations for defence as there were priorities in other sectors, namely healthcare and education, requiring more government attention."*

(RP 5, 2022)

However, despite budget limitations, the government must develop the industry to compete globally strategically. Currently, the implementation of the project has taken into consideration obsolescence management, but the government is also trying to bail out the multimillion-long sail project. However, This effort is affecting MOD's current and future planning. Hence, government and the industry must collectively surmount the budget limitation issue with greater rigour. For example, in Singapore, their defence budget is more extensive. However, the government supports and protects R&D upgrading by using local expertise. Concurrently, they still procured from overseas with strategic cooperation and collaboration with local companies to develop, thus creating local job opportunities.

#### *Lack of Talent and Competent Human Capital*

As talent and skills are vital to sustaining any industry, another core challenge is the skills gap of the right talent for the defence industry. Based on the interviews, there were three (3) significant issues on best talent recruitment in the defence industry. Firstly, it is on the supply of skilled graduates capable of absorbing and working with the technology available in the

market. Similarly to other technical industries, it is a struggle for the company to recruit an appropriate mix of skills and talent due to insufficient supplies of qualified and skilled manpower to absorb technology. Most graduates in the market are more theoretical knowledge rather than skilfully capable. Thus, they must invest in fresh graduates and upskill them before working in the industry. However, the government tried to curb the issue with the enrichment of Science, Technology, Engineering and Mathematics (STEM) aimed to empower and equip the graduates to meet the necessity and requirements of the industry. Still, this effort is yet to be seen as effective.

*"...Our graduates are not like those from foreign countries, for example, from South Korea, where either university or college graduates, when employed, are already equipped with specific skills and possessed designated competency to serve in the Armed Forces and later in the industry."*

(RP 14, 2022)

The second issue is to attract talent into the defence industry. The lack of interest apart from negative perception due to the current achievement of the industry is also due to the lack of patriotism of the people. The government clearly outlined in both NDP and DWP that the inclusive involvement of people from every layer of society in Total Defence is crucial in culminating patriotism and security culture among the people. Other countries achieved this aspiration by implementing a national service programme, namely Singapore, India, Korea, etc. However, this is not the case for Malaysia after the National Service Training Programme, better known as *Program Latihan Khidmat Negara* (PLKN), which only commenced 15 years from 2003 before it ended in 2016.

*"...The national training programme exposed people from every layer of society to basic military skills, hence certified reservists. So, some, or instead everybody, has specific military training, which is different from what happens in reality, even though NDP and DWP are well written for this purpose."*

(RP 14, 2022)

Thirdly, diluted skills and expertise of the younger generation of military officers. Before the privatisation programme in 1997, numerous middle-rank officers of RMAF were against the idea. They foresee that RMAF's current expertise and skills will dilute with the programme's implementation as they no longer do hands-on service activities. Also, RMAF doubted the industry's sincerity in growing locally and enhancing its capabilities.

*"...Sadly, after 25 years of implementation, true enough, the later generation of RMAF was no longer expertly skilled as their seniors before the programme."*

(RP 7, 2022)

The significant impact of government support to spearhead the defence industry, as per the findings of this paper, can be seen in the Singapore defence industry. In this case, Tan argued that the Singapore government rejects any direct state subsidy supporting its defence industry. However, indirect forms of subsidy from the government can be inferred from high defence spending and procurement of local products by the Singapore Armed Forces (SAF). This action can be implied as an indirect subsidy as much of the product was sold to SAF, and most of them would not be viable without SAF contracts (Tan, 2013). In the meantime, the key to successful and effective policy implementation is essential to develop a country. Successful implementation requires an effective administrative structure, efficient financial management, transparent procedures and a workforce trained according to appropriate roles and responsibilities (Tezera, 2019).

**Governance***Uncertain Roles and Support of the Government in the Local Defence Industry*

Government solemnity support and genuine intention to spur head the industry is one of the hot topics that many research participants expressed their concern about. RP 11 expressed frustration with the former project he acquired from the government.

*"...Prior to the awarded contract, my company had made a plant and assembled the 1st regiment of 105mm artillery guns. What guarantees my company will get the next contract? Maybe the government will be awarded to another company."*

(RP 11, 2022)

However, there was no continuity for the industry to sustain and ameliorate their technology to another level as the government tends to do short-term procurement. Another similar example is that although the government has spent billions of ringgit on the blueprints for assets, namely the Armoured Vehicle (AV) Adnan, AV Pendekar, and the AV Gempita, where development on the local scale ends once the contract is fulfilled with no further continuity (Zulkifli, 2022). Several research participants expressed their frustration as the current approach by the government procurement does not reflect the intention to avant-garde the industry. Moreover, many procurements were not strategically made to inspire the long-term spill effect as they were short-sighted based on short-term requirements and competitive pricing.

For the industry to venture and invest in R&D, they seek long-term collaboration opportunities for economies of scale worthy of production return on investment. For example, in 2010, a contract was offered to a local company to manufacture a ship. Prior to the contract, the company was required to build a factory. However, eventually, the company turned down the offer as the government could not ensure future projects to acquire a good investment return. There is also concern about the importance of being a member of MIDES, where priority or privileges in the procurement process are not given to actual indigenous local companies.

*"...Although my company is a member of MIDES, the membership privileges and the star rating classification are unlikely to add value as there is no merit for government contracts. In addition, government procurement is still operationalised in open tenders, and non-indigenous companies are entering as traders, thus damaging the industry."*

(RP 18, 2022)

The research participants also signify their challenges in two areas: first is sufficient funding. The defence industry is high-cost and requires capital from developing novices' products until product maturity. After that, they must go through vicious cycles of costly development, prototype, testing and production until proven to be working correctly. It is not an overnight endeavour but requires commitment and dedication from skilled manpower. Second, the industry needs greater assurance support from the government, particularly in the provision of long-term contracts to benefit from the return on investment.

Another contentious issue is how MOD segregate a genuine industry player concerning the presence of a trading company that takes advantage of the government award without contributing substantially to the industry. For example, the purchase of armoured vehicles. The government must make it mandatory to use fire control systems made by local Malaysian companies, which will be installed in the armoured vehicles. Although there is a policy that says 'Buy Malaysian Product First', compliance is still poor. The government needs to implement and enforce this policy so that the capabilities of the local defence industry can be improved.

*“...The government must compellingly enforce the use of local indigenous products in defence procurement and provide incentives to drive the implementation. However, this action is yet to be seen.”*

(RP 18, 2022)

Based on the analysis above clearly shows that roles and support from the government in the local defence industry are essential and very much needed to ensure the efforts and implementation by industry players can make the industry able to sustain and achieve self-reliance in the future.

#### *Improper and Poor Governance*

DWP clearly states that the primary drivers in Defence Science, Technology and Industry are MINDEF, primarily the Science and Technology Research Institute for Defence (STRIDE) and the DID, the MAF, and other related ministries and agencies. In this landscape, DID is entrusted as the focal point of the defence industry as well as the secretariat of MIDES. DID, which was formed in 1972, was entrusted with a strategic role to facilitate Malaysia's defence industrial progress, which includes participation and promotion of the defence sector locally and abroad through bilateral platforms and defence air shows, as well as assisting and preparing the industry to face current and future challenges (Balakrishnan, 2008). This Division reports directly to the Secretary-General and consists of four main units: Defence Industry Development; Offsets; Defence Industry Bilateral; and Defence Exhibition and Privatisation, with a total manpower of 20 officers from both civilian and military officers (as of 31 December 2022). However, the industry-viewed role of DID is more towards the Industrial Collaboration Programme (ICP) and conducting exhibitions (Defence Service Asia is one of the major exhibitions held bi-yearly). Some research participants expressed that the role of DID and MIDES should be more effective in facilitating the industry. For example, although MIDES membership comes with a star rating, it does not carry any merit in the procurement contract. Another example is MIDES/DID should be more facilitative with the industry application for tax exemption incentives instead of bureaucratically frustrating. There were also instances that what is offered through ICP does not meet the purpose of defence technology transfer but is more generic to the non-defence sector.

Meanwhile, since its inception in 1958, STRIDE has been focusing on defence R&D and providing technical support upon request exclusively for MINDEF. STRIDE only has fewer than 100 research officers. Unlike other countries, taking the example of Singapore, the Defence Science Organization (DSO) has over 2000 scientists and engineers to focus on developing defence R&D. This is far behind Singapore, which also has a Defence Science and Technology Agency (DSTA), with over 2000 engineers and IT professionals to focus on producing highly innovative technology products. With limited numbers of research officers, STRIDE is overburdened to perform their designated responsibility effectively.

The procurement award process is also another controversial and sensitive issue hotly debated in the defence industry. There were concerns and allegations about the integrity of the procurement process, including political interference, personal interest, abuse of power, mismatch of specifications versus product delivery, and many more. For example, the scandalous acquisition of six Second Generation Patrol Vessels (SGPV) of the Littoral Combat Ship (LCS) RM9.13 billion project procurement is full of integrity issues listed above as reported by the Governance, Procurement and Finance Investigation Committee (Ministry of Defence, 2022). Another challenge to governance, as highlighted by the research participants, is over-monitoring and constant government specification changes. Although the monitoring is beneficial, but if done excessively, it will be fibrous. In this case, once the contract is



materialised, changes in the specification should be minimised to avoid the vicious cycle of project delay.

In line with the findings of this paper, the impact of good governance towards Indonesia's defence industry was also discussed by Tutu et al. The author argued on how bureaucracy is a service, not a power. They also stated that national stability and economic growth could be materialised with good governance. This state is because, with good governance, the actual potential and utilisation of national resources as a source of national income for the benefit of national defence can be unleashed to realise people's prosperity and national security (Tutu et al., 2022). Similarly, the implementation of good governance in the Turkey defence industry has improved transparency in decision-making, thus effectuated to minimising corruption (Bucur-Marcu et al., 2009). Kim & Kuehn also thoroughly discussed that many people view South Korea's transformation from military-controlled authoritarianism to a stable civil-dominated democracy as a success story. Among the strategies implemented is to strengthen civilian control in military affairs further, eliminating fraud related to the procurement process. This strategy to develop the defence industry in the country can improve human rights and service governance. Furthermore, the success can be bolstered by sufficient resources related to good civilian education opportunities in military and defence affairs. This effort may address the lack mentioned above of expertise among civilians in military-technical issues and promote the development of greater civilian cohesion (Kim & Kuehn, 2022).

### **Leadership**

Leadership is critical in formulating and synergising a strategy into success. The ship sinks or sails depending on the captain's will, wisdom, aspiration and capability. In the Malaysian defence industry, there were issues pertaining top level defence leadership which also included controversy and credibility of the captain of the industry, in this regard, the Minister of Defence. First, the direction of the industry must be clearly outlined. Since there were issues plaguing budgeting and funding for defence, the ministry needs to strategically prioritise which sector and product have a more significant potential to spur industry growth. Henceforth, a strategic action plan must be formulated to operationalise the planning within a realistic time frame.

Second, there must be a solid political will to drive the industry. Amid the turmoil in Malaysia's political landscape since 2018, the captain of the industry frequently changed from one administration to another. Political instability has called into question of policy continuity. Given that DWP was established during the previous administration, there were concerns that it may have affected the policy implementation. With the limited timeline of 10 years to be actualised, the captain of the industry must be politically aligned with the direction of DWP. Furthermore, Malaysia faces increasingly tense geopolitical dynamics in the neighbourhood, particularly in the maritime domain, from state to non-state actors. Thus, top leaders of MOD must comprehend the actual needs of MAF firmly. The quality that must be present in MOD leadership is having a strategic purpose, strategic will and the right direction and heading. A leader must have a strong positive influence, from convincing the government to increase the annual defence budget to gearing up the industry players to be globally competitive. However, in this case, the strength of national behaviour and strategic culture will also influence the quality of leadership and national agenda, namely Singapore and Indonesia. Taking the example of the President of Indonesia, Jokowi, has the proper and clear heading and has a powerful positive influence. As one of the prominent top government leaders,

Mahathir Mohamed has introduced and implemented privatisation of the defence industry. His visionary ideas should be sustained with another capable successor who equally possesses strong leadership. Another instance is Najib Razak, who possessed foresight vision and managed to enhance armoured vehicle manufacturing by providing a platform for a local company to venture into the product. Of course, every captain has their own vision, priority and agenda. Still, they need to be consistent with the national agenda set by the previous administration for the nation's benefit instead of politicising it for personal agendas.

Thirdly is on the affirmative decision of the industry's captain. For example, the proposal for the Defence City location keeps changing from one state to another depending on the parliamentary area of the Minister. Although the motives are understandable, constant changes in the venue are an unnecessary hassle to the industry. Moreover, the idea of establishing a defence city is to provide logistical support, tax exemption and privileges to spearhead the industry. Thus, the delay in determining the location is unacceptable, as many more significant issues must be addressed.

Fourthly, the controversial and scandalous defence mega procurement also tarnishes the industry's integrity. This situation can be seen in the construction of six Littoral Combat Ships (LCS), which started in 2013 and by 2023, there is still not one ship that the company has completed.

*"...I believe the integrity issue is hotly debated in the defence industry, challenging its integrity and genuine intention. The construction of the Littoral Combat Ship (LCS), owned by RMN, which has gone through a vicious delay cycle, has triggered a massive blow of trust from the public and international society. Although in the past, Boustead Naval Shipyard (BNS) has a good track record with numerous projects awarded to them was successful, the controversy of the LCS project, to name a few, includes abuse of power, improper governance and misappropriation of funds, have tarnished the company's reputation over its past success."*  
(RP 1, 2022)

The critical role of strategic leadership in determining the success of the defence industry, as discussed in this paper, can be reflected by the rising success of Turki, as argued by Demir, the current President of the Turki Defence Industry, that the recent rise of the Turkish defence industry as a result of great transformation in all dimensions since 2002, was accomplished under the direction and leadership of the Turkish President, Recep Tayyip Erdoğan. The leadership factor, crystallising in the political leadership of President Erdoğan, has managed to transform the industry with the implementation of Sectoral leadership achieved through being at the centre of bureaucratic mechanisms (Demir, 2020).

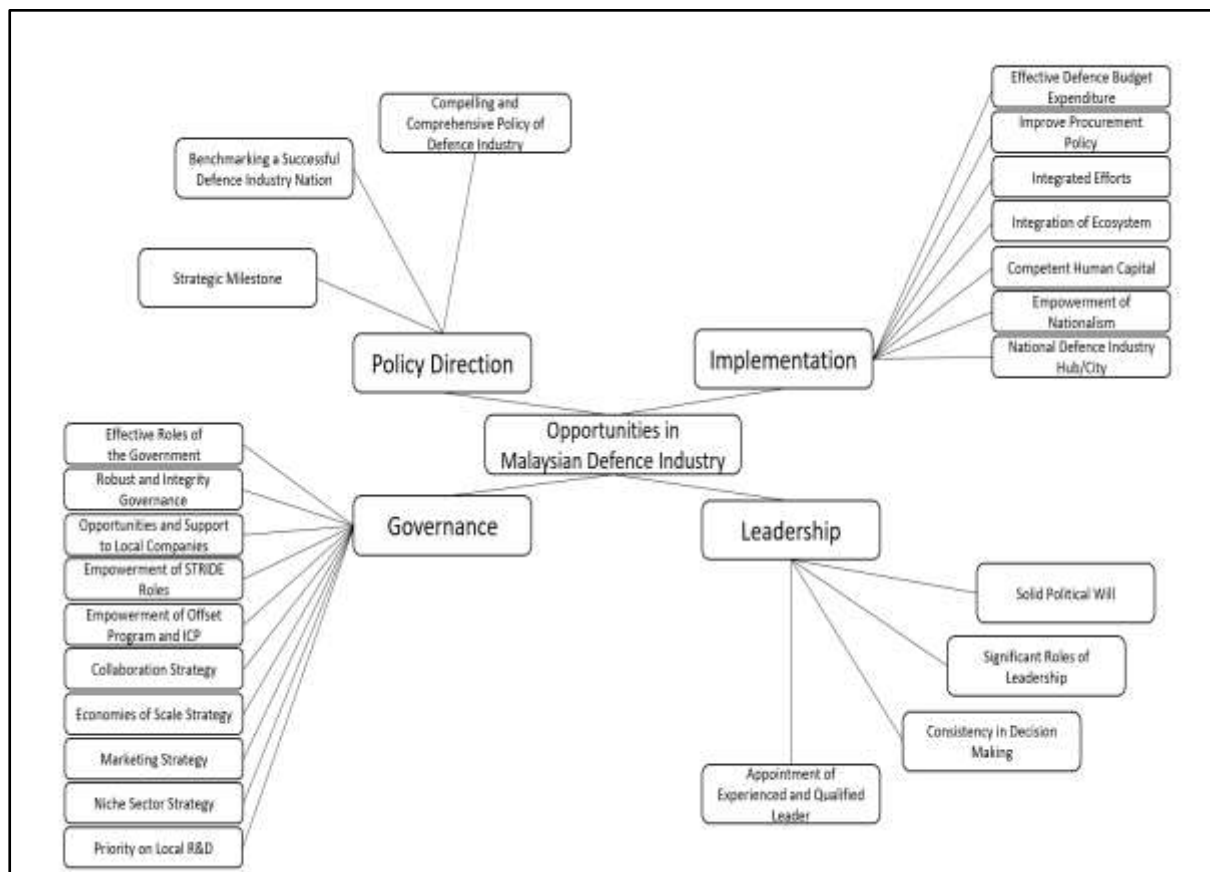
## **Conclusions**

The aspiration of achieving a sustainable defence industry in Malaysia can be actualised despite the abovementioned challenges. For every challenge, there is a broader opportunity that awaits to be unleashed. Based on the findings and discussion above, the opportunity for the Malaysian Defence industry can be conceptualised as per Figure 2 below. However, the opportunities stated in this paper may not be ideal and suitable to be implemented in the government of the day and are subject to the current rules and procedures provided by the national defence industry.

The opportunity is segregated into four themes per challenges findings from this research. The first opportunity from Policy direction can be achieved with a compellingly clear and comprehensive direction of the defence industry. To elucidate this policy, detailed action with strategic milestones must be transparent and agreeable to all relevant industry players. The

industry players can also benchmark measures that have proven successful in other countries, namely Singapore, Turki, and many more. As discussed above, for the United Kingdom's defence industry, a clear and transparent defence industrial policy are significant to ensure the country's aspiration to develop the industry capabilities the way they wanted and chose. The government must also implement the mission and vision as required in the DWP and related policies properly and vigorously, eliminating bureaucracy and other distractions. The essential and critical thing is that the strategy must be clear, and all parties involved must take action according to the set direction and time. Furthermore, the government's policy on the national defence industry must be apparent and successful in realising the goals of the country's future aspirations.

Henceforth, the second spectrum is the implementation which is segregated into seven dimensions, namely effective defence budget expenditure, an improvement on procurement policy and implementation, integrated effort by all parties pertinent to the industry, integration of ecosystem within the government, end users, defence R&D centre, local university and so on, providing human capital with the right skills and competency for the industry, empowerment of nationalism, and establishment of defence hub city with logistic support and other facilities. The necessity of the industry to develop design and integration capability and a powerful MRO, leading with strategic partners, is beyond crucial. This effort is to achieve a dynamic, competitive, sustainable, respected competitive defence industry, reducing reliance on the government and competing to supply products outside Malaysia. Going beyond the Malaysian market and participating in international tenders is the future defence industry. Asian Defence Industry Collaboration is one of the platforms to gain new opportunities in developing the local defence industry. As discussed above in the research findings, Singapore Defence Industry is an excellent example of how effective implementation contributes to a thriving and excellent industry.



**Figure 2.** Opportunities in the Malaysian Defence Industry (Source: Author)

Thirdly is the spectrum of governance. In this regard, the opportunity through good governance can be signified into ten dimensions, namely effective roles of the government, establishing robust and integrity governance, providing solemnity opportunities and support to local industry players, empowering STRIDE role as R&D key drivers, empowerment of Offset Program and Industrial Collaboration Programme with significant impact to the industry, Collaboration Strategy, Economies of scale strategy which involved long term strategic procurement implementation, enhancing marketing strategy through relevant agencies namely the Malaysia External Trade Development Corporation (MATRADE), prioritise niche sector strategy and facilitate local R&D through incentives and relevant support. The critical role of governance impact is signified by the growth of Indonesia, Turkey and South Korea's defence industries.

Lastly, the leadership spectrum can be derived from solid political will, significant roles of leadership, consistency in decision making and appointment of the right captain of the industry with relevant experience and qualifications. As discussed above, strategic leadership played a vital role in determining the success of the industry, as demonstrated Turki defence industry. Furthermore, as mentioned above, leadership is critical in formulating and synergising a strategy into success. Thus, it is pivotal for the captain of the industry to have the right mindset, equipped with the knowledge and relevant experience to actualise a thriving defence industry in line with self-reliance aspiration.

In conclusion, Malaysia must have a robust defence industry capable of producing product solutions, not just to contribute to the economic dimension, job creation, export, revenue, etc., but, more importantly, to be more reliable in supporting MAF. In this regard, the defence industry's future depends on all parties' commitment, from the government, military and

local defence companies. Collaboration among the government, various agencies, and further industry involvement is necessary to identify niche areas, produce high-quality national indigenous products, and comply with all requirements required by MAF. All players must unite for the national defence industry to become stronger through collaboration and integration to develop a sustainable ecosystem. It is almost like a strategic partner to MAF in helping the development of capability. The milestone targeted must be realistic and strategically objectified with clear, compelling action plans. Maybe for the next ten years, the country can start producing a more minor and less-sophisticated system or platform and slowly grow and step up the pace to take to the next level: building more extensive and more sophisticated equipment.

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### **References**

- Adrian Kuah, & Bernard Loo. 2004. Examining the Defence Industrialization – Economic Growth Relationship: The Case of Singapore. Institute of Defence and Strategic Studies Singapore, 70, 1–21. <https://www.rsis.edu.sg/wp-content/uploads/rsis-pubs/WP70.pdf>
- Ahmad Mustakim Zulkifli. 2022. The Missing Element in Malaysia's Defence Industry. <https://www.malaysianow.com/news/2022/08/15/the-missing-element-in-malaysias-defence-industry>
- Amirudin Sulaiman, Ruhanas Harun, Mohd Zaini Salleh, Ananthan Subramaniam, Wong Wai Loong, Norlaila Mazura Mohaiyadin, & Syafina Darlila Ahmad Jaid. 2020. An Overview of the Malaysian Defence Industry and Way Forward. *International Journal of Academic Research in Business and Social Sciences*, 10(8), 1076–1083. <https://doi.org/10.6007/ijarbss/v10-i8/7715>
- Andrew T. H. Tan. 2013. Singapore's Defence Industry: Its Development and Prospects. *Security Challenges*, 9(1), 63–86. <http://www.jstor.com/stable/26461969>
- Ansar Tutu, Zainal Abidin Sahabuddin, & Anton Imam Santosa. 2022. Implementation of Good Governance in Defense Economy Perspective. *International Journal of Arts and Social Science*, 5(1), 90–96. [https://www.academia.edu/76488748/Implementation\\_of\\_Good\\_Governance\\_in\\_Defense\\_Economy\\_Perspective](https://www.academia.edu/76488748/Implementation_of_Good_Governance_in_Defense_Economy_Perspective)
- Debela Tezera. 2019. Factors for the Successful Implementation of Policies. *Merit Research Journal of Education and Review*, 7(8), 092-095. <https://doi.org/10.5281/zenodo.3382780>
- Defence Industry Division, Ministry of Defence: Malaysia. 2021. *The Malaysian Defence Industry*.
- Hari Bucur-Marcu, Philipp Fluri, Todor Tagarev. 2009. *Defence Management: An Introduction*. In Geneva Centre for the Democratic Control of Armed Forces (DCAF), Security and Defence Management Series No. 1. [www.dcaf.ch](http://www.dcaf.ch)
- Insoo Kim, & David Kuehn. 2022. The Ministry of National Defence in South Korea: Military Dominance Despite Civilian Supremacy?. *Journal of Strategic Studies*, 45(6–7), 865–892. <https://doi.org/10.1080/01402390.2022.2127092>

- Ismail Demir. 2020. Transformation of Turkish Defense Industry: The Story and Rational of the Great Rise. *Insight Turkey*, 22 (Summer 2020), 17–40.  
<https://doi.org/10.25253/99.2020223.02>
- Kogila Balakrishnan. 2008. Defence Industrialisation in Malaysia: Development Challenges and the Revolution in Military Affairs. *Security Challenges*, 4(4), 135–155.  
<https://www.researchgate.net/publication/228469483%0ADefence>
- Kogila Balakrishnan, & Ron Matthews. 2009. The Role of Offsets in Malaysian Defence Industrialisation. *Defence and Peace Economics*, 20(4), 341–358.  
<https://doi.org/10.1080/10242690802333117>
- Kogila Balakrishnan, & Nadira Treesna. 2021. Malaysian Defence Industry: Context, Challenges and the Way Forward. *The Journal of Defence and Security*, 14(1), 1–18.  
<https://www.proquest.com/openvie...lar&cbl=1456373>
- Mark N. K. Saunders, & Keith Townsend. 2016. Reporting and Justifying the Number of Interview Participants in Organization and Workplace Research. *British Journal of Management*, 27(4), 836–852. <https://doi.org/10.1111/1467-8551.12182>
- Ministry of Defence: Malaysia. 2010. *Dasar Pertahanan Negara* (National Defence Policy). 65.  
<http://www.mod.gov.my/phocadownload/DASAR-PERTAHANAN/dpn-terbuka.pdf>
- Ministry of Defence: Malaysia. 2020. Malaysia Defence White Paper 2020 - A Secure, Sovereign and Prosperous Malaysia. In Percetakan Nasional Malaysia Berhad, 1-92.  
<https://www.mod.gov.my/en/information/defence-white-paper>
- Ministry of Defence: Malaysia. 2021. Ministry of Defence Malaysia Annual Report From 2010 To 2021 For The Development Expenditure Budget.  
<https://www.mod.gov.my/index.php/en/penerbitan/category/laporan-tahunan>
- Ministry of Defence: Malaysia. 2022. *Laporan Berhubung Perolehan Kapal Peronda Generasi Kedua-Littoral Combatant Ship (LCS) Bagi Tentera Laut Diraja Malaysia. Laporan Jawatankuasa Kira-Kira Wang Negara (PAC) Parlimen Keempat Belas.*
- Ministry of Defence, UK. 2006. The Defence Industrial Strategy. House of Commons Defence Committee, Seventh Report of Session 2005-06. <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://publications.parliament.uk/pa/cm200506/cmselect/cmdfence/824/824.pdf>
- Mohamed Fajil Abd. Batau, Nazariah Osman, & Mohamad Faisol Keling. 2020a. *Kepentingan Industri Pertahanan Malaysia Kepada Keselamatan Negara.* *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 5(2), 7–12. <https://doi.org/10.47405/mjssh.v5i2.362>
- Mohamed Fajil Abd. Batau, Nazariah Osman, & Mohamad Faisol Keling. 2020b. *Keperluan Pembangunan Industri Pertahanan Malaysia.* *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 5(12), 106–111. <https://doi.org/10.47405/mjssh.v5i12.595>
- Moritz Weiss, & Felix Biermann. 2018. Defence Industrial Cooperation. *The Handbook of European Defence Policies and Armed Forces*, August, 693–709.  
<https://doi.org/10.1093/oso/9780198790501.003.0041>
- Research Participant 1. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 10 March 22.
- Research Participant 2. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 27 January 22.
- Research Participant 3. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 26 January 22.
- Research Participant 4. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 4 February 22.

- Research Participant 5. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 11 April 22.
- Research Participant 6. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 15 March 22.
- Research Participant 7. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 7 June 22.
- Research Participant 8. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 31 May 22.
- Research Participant 9. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 25 January 22.
- Research Participant 10. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 24 February 22.
- Research Participant 11. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 9 May 22.
- Research Participant 12. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 26 April 22.
- Research Participant 13. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 26 April 22.
- Research Participant 14. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 11 May 22.
- Research Participant 15. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 12 May 22.
- Research Participant 16. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 9 May 22.
- Research Participant 17. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 22 April 22.
- Research Participant 18. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 20 May 22.
- Research Participant 19. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 12 June 22.
- Research Participant 20. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 26 May 22.
- Research Participant 21. 2022. "Defence Industry in Malaysia", [Personal Communication] interviewed by Erresafrinal Abdullah, 21 April 22.
- Richard A. Bitzinger. 2015. Defense Industries in Asia and the Technonationalist Impulse. *Contemporary Security Policy*, 36(3), 453–472.  
<https://doi.org/10.1080/13523260.2015.1111649>
- Syed Abdul Haris Syed Mustapa, Muhamad Saiful Bakri, Mohamad Faisal Keling, Mohd Ainuddin Iskandar Lee, & Nazariah Osman. 2020. Malaysian Armed Forces Logistic Management Problem: The Effect to the Country's Defence. *International Journal of Supply Chain Management*, 9(1), 499–510.  
<https://www.researchgate.net/publication/348835172>
- Zulbasri Othman, Mohd Daud Johari, & Anuar Shah Bali Mahomed. 2018. Malaysia's Defence Industry: Self Reliance Policy. *Global and Stochastic Analysis*, 5(7), 201-212.  
[https://www.academia.edu/77190248/Malaysians\\_defence\\_industry\\_self\\_reliance\\_policy](https://www.academia.edu/77190248/Malaysians_defence_industry_self_reliance_policy)
- Zulbasri Othman, Mohd Daud Johari, Mohd Nor Yahya, & Anuar Shah Bali Mahomed. 2019.

Malaysia's Defense Industry: Will It Has More Solid Presence and Become Competitive Locally and International Market. International Journal of Advanced Science and Technology, 28(16), 426–436.

<http://sersc.org/journals/index.php/IJAST/article/view/1778>