

An Integrated Risk Management using Business Model Canvas: Designing Business Model Options for The Royal Malaysian Air Force in The Digital Era

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Abstract: The risk management becomes an important element in the organizations especially corporate organisation and it becomes a requirement to an organization if they want to expand their business to global. The risk management is important to the Royal Malaysian Air Force (RMAF) to show its readiness in facing up various risk. The RMAF responsibility is to safeguarding and protecting the dignity and sovereignty of Malaysian Airspace. In order to maintain airspace security, RMAF needs to identify the potential risk that can affect national security. The current risk management is good however, it still has a room for some improvement. The risk management is very important to help the RMAF to do preparation and mitigation according to the risks that have been identified. Every country has its own quality standard but mostly they are referring to the ISO concept. The aims of this study are to explore the knowledge on the risk management, to comparative study and to formulate a business model for The Future RMAF using Business Model Canvas (BMC) framework to assist identifying the strategic assets of the future RMAF. Thus, building a more effective and relevant Risk Management System. This review paper is based on secondary data in order to do the comparison and get the ideas to enhance RMAF Risk Management.

Keywords: Integrated risk management; industrial revolution 4.0; risk management; risk evaluation; risk mitigation; risk control; Business model; Business Model Canvas.

I. INTRODUCTION

Nowadays, the global risk is changing and evolves with the new issues especially when it related to the global climate change that can cause crisis and disaster. [1] Global risk can be defined as an uncertain event or condition that if it occurs, it can cause a significant negative impact for several countries or industries within the next 10 years. From that matter, every organization is required to have risk management to identify and analyze the potential risk in order to prevent, mitigate and control the risk. The risk of an organization is various and different depends on the role and function of the organizations. So, when it related to defence sectors the risk will high due to security issues. If the risk can't be control, the impact will be catastrophic.

Recently, Industry Revolution 4.0 (IR4.0) is taking placed and economies by storm. [2] The IR4.0 refers to the integration of technology, process and people that comprising growing trends in automation, the Internet of Things (IoT), big data and cloud computing technologies to support the company and manufacturing industry transition into the integrated smart system. [3] The IR4.0 ultimately changed the landscape and competitiveness of defence industries in a race toward the development of smart systems, equipment and assets. The integration of these systems will help to enhance global competitiveness and also to sustain country economies. The advancement of technology including IR4.0 usually comes with new risks as well as offering new opportunities.

The Royal Malaysian Air Force (RMAF) is part of the Malaysian Armed Forces (MAF) component. Their key responsibility is to safeguarding and protecting the dignity and sovereignty of the Malaysian Airspace. In order to maintain the airspace security, there will be various security risks that need to be managed, prevented, mitigated and control. [4] The Government of Malaysian has declared the national defence and security as the most important sector in national Critical Infrastructure (CI).

II. PROBLEM STATEMENT

According to the Malay language, the word *keselamatan* defined two different things which are security and safety. This Malay word somehow will lead people to a misunderstanding about definition. Some of the people may understand that security and safety are the same things. The security and safety are totally different but they have a connection in one another.

Malaysian defence sectors are exposed and vulnerable to any risk from internal and external of the country, especially when it is related to the national security. When it is involved with the defence sectors and national interest, the security risk management becomes crucial and priority from any risk. If national security is compromised, it will affect the peacefulness of the country. Every service in the Malaysia Armed Forces (MAF) has responsibilities to play, with their own roles and capabilities in protecting the country's sovereignty, including the RMAF. The risk management is very crucial for the RMAF including identifying the critical security risks. [5] The available risk management is good. However, there are still rooms for improvements in making risk management more comprehensive and relevance, especially in the era of digital and IR4.0.

III. METHODOLOGY

The global is changing in line with the risks. The business concept has changed toward the integration of systems to increase productivity and effectiveness. The RMAF needs comprehensive risk management that can be identifying the risks and the strategic asset for the future. The risk management needs to be frequently reviewed in ensuring its continued relevance in the digital era and future megatrends. This review paper is using secondary data as a method to do comparison and suggestion. Figure 1 showed the overview of proposed Risk Management Model for the RMAF. This study proposed three risk categories to connect with Integrated Risk Management. The security risk can be defined as a situation which poses a possible threat to the security, while the safety risk can be defined as assessment toward hazard identifying and the health risk can be defined as something that can harm to people's health. Integrated risk management in this study defines a combination of three risk categories toward the effectiveness of the risk management system.

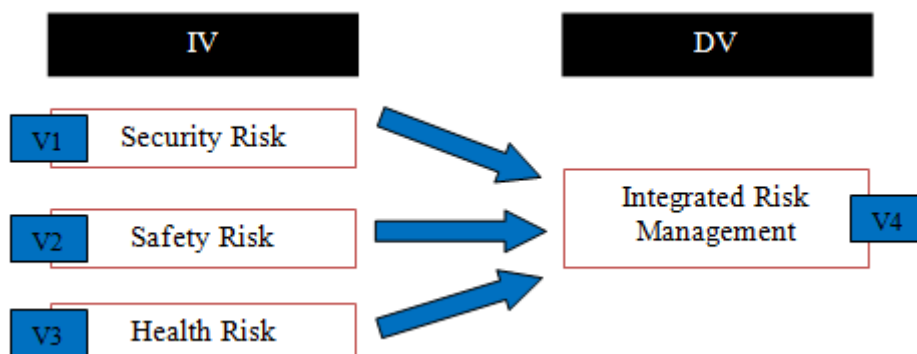


FIGURE 1: PROPOSED RISK MANAGEMENT MODEL

IV. LITERATURE REVIEW

A. British Standard ISO 31000:2018 Risk Management Process

The Risk Management Process in Figure 2 is a guideline for risk management. It is the improvement from BS ISO 31000:2009[6]. The risk management process should be integrated into the structure, operations and processes of an organization. There are several of the risk management processes that need to be customized to suit the context and meeting the organization's objectives. The process is actually just a guideline to the organization and it can be repetitive in some process.

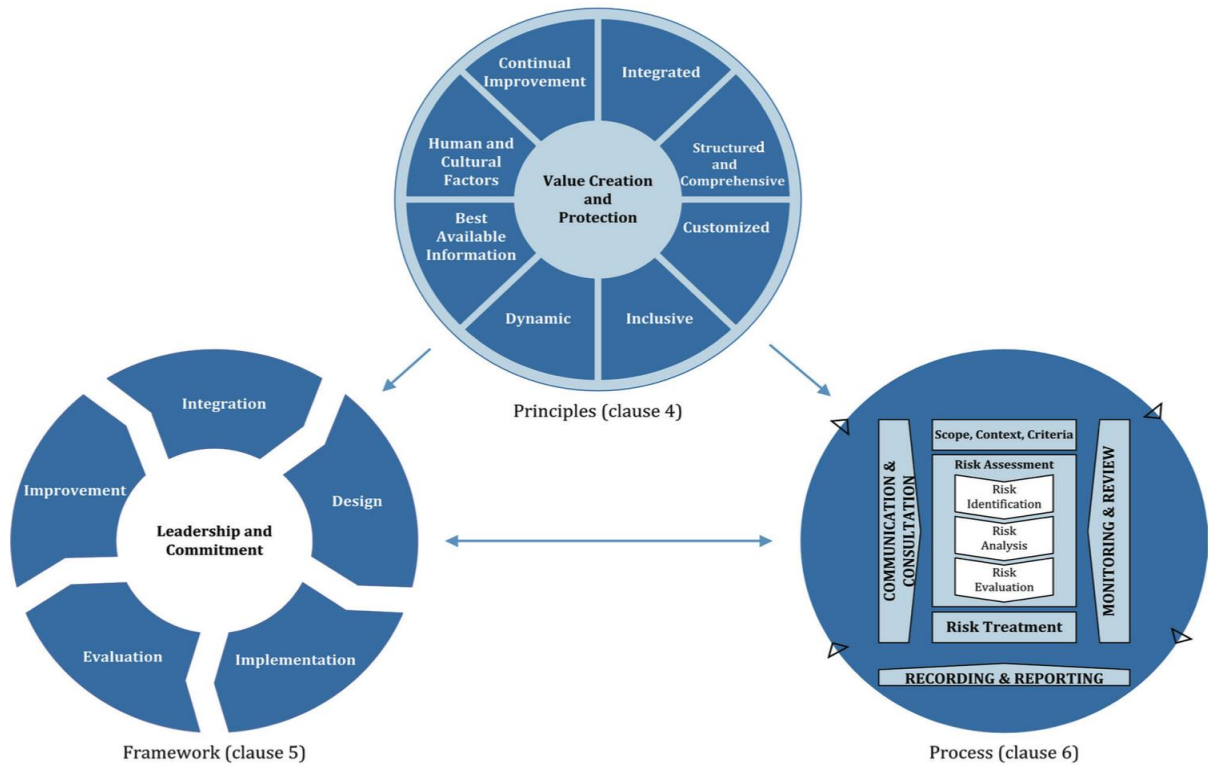


FIGURE 2: BS ISO 31000:2018 RISK MANAGEMENT PROCESS [6]

B. Impact of Industrial Revolution 4.0 (IR4.0)

The IR4.0 is a convergence of technology and integration in all platform into a smart system. [3] Discussed the impact of IR4.0 to the defence and security sector like the opportunities & challenges, technological advancements and its disruptions, innovation through Collaboration, realizing the potential of autonomous systems, finding the terrorist in using big and small data, and forging a new cyber security paradigm. This kind of information sharing during the Summit is for creating awareness among countries toward the impact of IR4.0 - the risks and opportunities, that needs to be learned, understood and prepared by the defence and security sector.

C. US DoD Risk Management Process

Figure 3 shows the risk management in defence acquisition program using the four step process [7]. It is a comprehensive risk management process, a lesson learnt for countries wanting to improve their risk management system.



FIGURE 3: US DOD RISK MANAGEMENT PROCESS [7]

D. Integrated Risk Management Framework

[8] Suggest an approach in Figure 3 to combine all the framework from previous research into integrated risk management in the area of knowledge protection. The proposed integrated risk management framework is to make every level in an organization to understand the importance of protecting knowledge, not only focus on protecting data and information. Knowledge is important to prove the organization is compliance to risk management standards and all aspect.

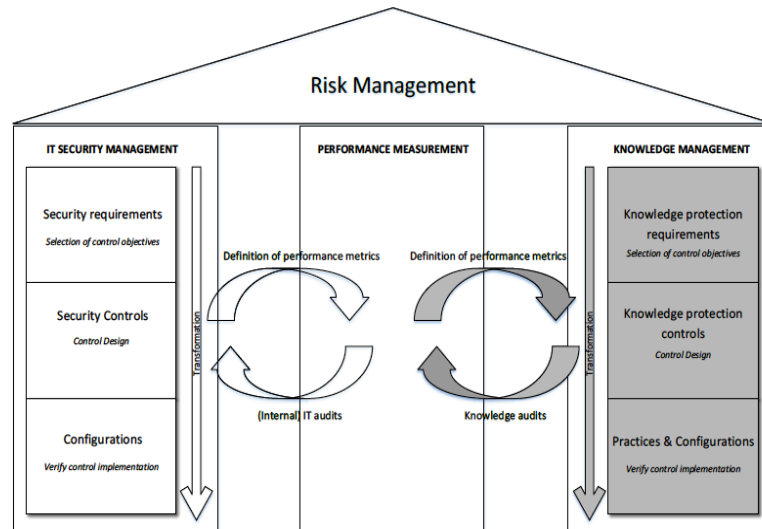


FIGURE 4: INTEGRATED RISK MANAGEMENT FRAMEWORK [8]

E. Australia Defence Risk Management process

The Australia Defence Risk Management Process is referring to the Australian Standard that comprised eight steps start from establishing the context, risk identification, risk analysis, risk evaluation, risk treatment, monitor & review, communicate & consult and lastly the documentation [9]. They also have identified the three levels of major risks in defence, namely enterprise risk, strategic risk and operational risk.

V. DISCUSSION

The available risk management for the RMAF shown in Figure 5 is focus on the Safety Risk Management (SRM) – it begins with a hazard identification element [5]. Safety is important but it must in line with the security and it should be the priority. From the researchers’ search via the Internet, there is no specific documentation or references on comprehensive risk management for RMAF. Risk management is a requirement for defence sectors like RMAF because the security protection of airspace is under the RMAF control and supervision. The RMAF always emphasize security awareness like put the signage about “safety first”, “safety start from home” and etc. This safety awareness is good but it must be aligned with the security culture and awareness.

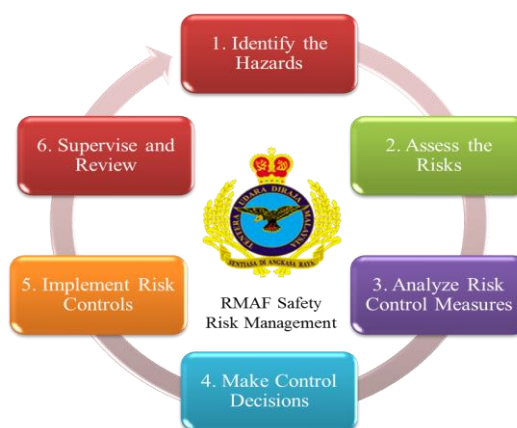


FIGURE 5: THE RMAF SRM PROCESS [5]

A. The RMAF Strategic Map

The 2018-2020 RMAF Strategic Map [10] as shown in Figure 6 to achieve the vision “Dominant Air Power”. To realize the RMAF vision, it needs full support from all levels of RMAF personnel as well as the effectiveness of key processes, systems, and technology. The RMAF mission is to defend national sovereignty, integrity through the effective use of airpower.

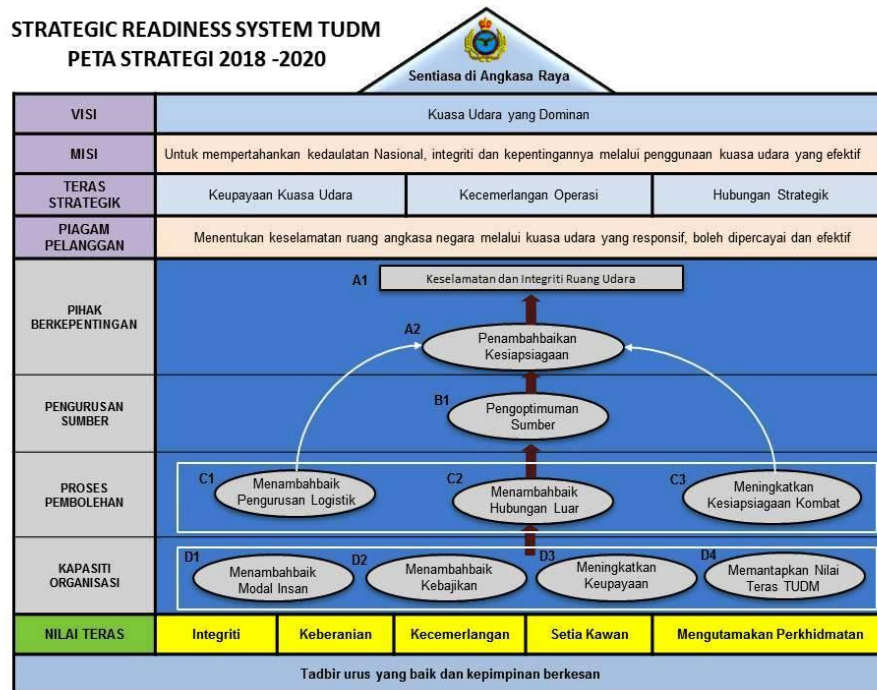


FIGURE 6: RMAF STRATEGIC READINESS SYSTEM 2018-2020 [10]

B. The RMAF Risk Assessment Matrix

The RMAF risk assessment matrix in Table 1 is used for uncertain events that could have many outcomes and for which there could be significant consequences. The risk assessment matrix used in SRM is a matrix to define the level of safety risk by considering the category of probability against the category severity. This is a simple mechanism to increase the visibility of risks and Table 2 assists management in the decision making process. [5] The quantification is divided into 4 categories that are low (green), medium (yellow), high (orange), extremely high (red).

TABLE 1: THE RMAF RISK ASSESSMENT MATRIX [5]

RISK ASSESSMENT MATRIX		PROBABILITY				
		FREQUENT (A)	LIKELY (B)	OCCASIONAL (C)	SELDOM (D)	UNLIKELY (E)
SEVERITY	CATASTROPHIC (1)	EXTREMELY HIGH	EXTREMELY HIGH	HIGH	HIGH	MEDIUM
	CRITICAL (2)	EXTREMELY HIGH	HIGH	HIGH	MEDIUM	LOW
	MODERATE (3)	HIGH	MEDIUM	MEDIUM	LOW	LOW
	NEGLIGIBLE (4)	MEDIUM	LOW	LOW	LOW	LOW

TABLE 2: THE RISK LEVEL DECISION MAKER MATRIX [5]

RISK LEVEL	DECISION MAKER	REMARK
EXTREMELY HIGH	Reduce to as low as reasonably	
HIGH	CoAF, ACoAF, CoAO	Strategic overview
MEDIUM	Air Div Commander, Base Commander	Operational overview
LOW	Squadron/Unit Commander, Accountable officer/supervisor	Tactical overview, Routine mission/task

VI. CONSIDERATION AND SUGGESTIONS

A. Developed The RMAF Business Model Canvas (BMC)

RMAF Risk Management maybe be formulated and developed by using business modelling tools such as the Business Model Canvas [11]. BMC will facilitate for easy understanding of what is strategic and important in the overall business, initiatives or projects that we are doing – in this paper is in safeguarding the airspace and country. By using the suggested BMC with the 9 building blocks (see Table 3), it makes the identification of strategic risks and its associated operational risks much easier. From Table 3, the strategic assets include items listed under the Key Resources, Key Activities, Key Partners, Customer Segments, Channels, and Customer Relationships blocks. These strategic assets must be accompanied by their relevant risk management plan. The suggested RMAF BMC must-have improvements to ensure its continued relevance to the national security by harnessing future trends such as IR4.0, while at the same time managing new risks brought by these future capabilities.

TABLE 3: A POSSIBLE RMAF BUSINESS MODEL CANVAS

<u>KEY PARTNERS</u>	<u>KEY ACTIVITIES</u>	<u>VALUE PROPOSITIONS</u>	<u>CUSTOMER RELATIONSHIPS</u>	<u>CUSTOMER SEGMENTS</u>
<ul style="list-style-type: none"> Ministry of Defence Royal Malaysian Army Royal Malaysian Navy National Security Council Civil Aviation Authority Malaysia Royal Malaysia Police Malaysia Coast Guard FDPA country Commonwealth Countries ASEAN Country 	<ul style="list-style-type: none"> Country Defence Security Protection Operations Training Counter Attack Combat SAR Peacekeeping MOOTW 	<ul style="list-style-type: none"> Security Protection Peacefulness Patriotism National, Charity & Welfare Community Engagement Works 	<ul style="list-style-type: none"> Media Good Relation Civilian Support Civilian & Military Coordination Social Media Information Sharing Web Sites & Digital platform 	<ul style="list-style-type: none"> Malaysian Citizens <ul style="list-style-type: none"> Individual Community Businesses Donors/sponsor
		<u>KEY RESOURCES</u>	<u>CHANNELS</u>	
		<ul style="list-style-type: none"> Aircrafts/Transports Skilled, professional & ethical Personnel Weapons/Ammunitions Logistic Communication Computer System 	<ul style="list-style-type: none"> Social Media News Online & Digital Platform Open days Radio TV Interviews Customer Service 	
<u>COST STRUCTURE</u>			<u>REVENUE STREAMS</u>	
<ul style="list-style-type: none"> Aircraft Maintenance Personnel Salary Transport Maintenance Weapons maintenance Ammunition Stock 			<ul style="list-style-type: none"> Government Financial Budgets Government Emergency Budgets Government Special Budgets UN Peacekeeping & Military Observer Budgets Donations/Sponsorships 	
<ul style="list-style-type: none"> Communication Cost Electrical Cost Mileages Claim War Ransom Logistic purchasing Items Appoint Contractors 				

B. The RMAF Risk Identification

According to Francois (1998), the first step of the risk management process is that is the most critical functions are probably the identification process. A failure to identify the existence of one or more potential risks can result in financial or reputation loss. To identify the existence risk before it happens is not the easy way and there is no systemic approach to the identification process. From the BMC with the 9 building block (see Table 3), the process of identifying risks will become much easier. Table 4 has shown some examples of identified risks from external and internal using proposed BMC that probability will occur due to current threats and global risks report.

TABLE 4: EXAMPLE OF THE RMAF IDENTIFIED RISK

Cyber Attack	Terrorist Attack	Bombs	Outdated Computer System	Unsatisfied Personnel	Unauthorized Entry	
Espionage	Arson	CBR Contamination	Foreign Object Damages (FOD)	Information leaked	Sabotages	
Natural Disasters	Ballistic Attacks	Bird Strikes	Misuse of Power	Misuse of Drug and Controlled Poison	Criminals	

VII. CONCLUSION

The risk management needs to be comprehensive in every aspect in as it become an important tool in risk prevention, mitigation and control. The integrated risk management provides holistic mitigation strategies in the protection of assets, information and peoples. The risk management standards provide a framework or process that takes a close approach to risk management that not only focus on security risk, it also can be used in safety and health risk management. The improvement and integration of RMAF Risk Management are very important to provide early preparation and mitigation to overcome any risks. The frequent review on integrated risk management also can help the RMAF to strengthen the airspace security and increase security protection at the national level. The implementation of security cultures among the personnel also is needed to enhance security awareness. The convergence of integrated risk management (see Figure 1) should become a priority in order to get comprehensive and accurate risk data to analyze. The contribution of BMC 9 block in identifying the RMAF key strategic assets can be an option to enhance the capabilities and effectiveness toward achieving its vision. On top of that, it can be used to develop a risk register for each key asset. The registered risk can be data to the RMAF Strategic Level to analyze and identified the current requirement for prevention and mitigation.

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