



Aviation Professional Industry Insights: Post COVID-19 Pandemic Business Management for Malaysian Aircraft Maintenance Repair and Overhaul Organisations

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ABSTRACT

As the pandemic CoronaVirus Disease 2019 (COVID-19) continues to impact the global aviation sector, the Malaysian aircraft maintenance organisation must plan effective business management methods for recovery. The pandemic of COVID-19 had a detrimental impact on both aircraft maintenance activities and the profitability of aircraft Maintenance Repair and Overhaul (MRO) organisations, which resulted in layoffs, restructuring and permanent company closures. The purpose of this study is to provide the post COVID-19 pandemic business management method for the Malaysian aircraft maintenance repair and overhaul organisation affected by the COVID-19 pandemic in order to improve business value. This study identifies the pre and post COVID-19 scenario of aircraft MRO organisations and proposes an industrial standpoint business management method. A literature review and qualitative interviews served as the research method for this study. Five aviation professionals in Selangor, Malaysia were subjected to semi-structured survey questionnaires with a focus on business management during the COVID-19 pandemic. The findings show that taking advantage of selling more corporate jets with all-in-one maintenance packages, government assistance via budgetary, policy-making and simplifying regulation during aircraft re-activation, engagement with government and aircraft training providers promotes a good reputation for the company to attract foreign investors and acquiring managerial and technical professionals from other nations allows the company to tap into the global market. The data gathered from aviation professionals contributed to the development of the study's aim, to propose post COVID-19 pandemic business management method to Malaysian aircraft MRO organisations affected by the COVID-19 pandemic to improve business value.

1.0 Introduction

The CoronaVirus Disease 2019 (COVID-19) pandemic disrupted the aviation industry by imposing travel restrictions that had a substantial impact on airline supply and revenue thus the global economy is anticipated to suffer losses of at least \$2 trillion in 2020 and these forecasts are directly applicable to the aviation industry since airlines have grounded aircraft which directly

to a drop in passenger volume and governments have restricted international travel and border crossings accounting for more than two-thirds of total gross passenger operating expenses (Melas & Melasová, 2020). Malaysia likewise issued a nationwide Movement Control Order (MCO) on March 18, 2020 until the spread of this new virus is controlled (John Bunyan, 2020). This MCO had a detrimental impact on the national economy, tourism and the aviation sector since the demand for air travel declined dramatically as passengers postponed their flights, thus airlines suffered business losses (Siti Farhana Sheikh Yahya, 2020). The industry is expected to lose Malaysian Ringgit (RM)13 billion this year as a result of the travel restrictions and RM10.9 billion losses from Malaysia Airlines Berhad, AirAsia Group Berhad and Malindo Airways Sendirian Berhad (Siti Farhana Sheikh Yahya, 2020). Overall, this has a substantial impact on aircraft operations and disturbs existing aircraft maintenance job demand, resulting in the grounding of the aircraft.

During the travel restriction phases, aircraft maintenance activities were postponed, aircraft were grounded and airlines were seeking newer generation aircraft, contributing to slowing down business management in Maintenance, Repair and Overhaul (MRO) organisation as aircraft must age before visiting MRO organisation before coming for major maintenance activities (SATAIR, 2021). Furthermore, MRO organisation business management worsened as a result of commercial aircraft being grounded, resulting in lower utilization and lower aircraft wear and tear rates (David Stewart, Tom Cooper, Brian Prentice, & Ian Reagan, 2020). David Stewart et al., (2020) also mentioned Air New Zealand's decision to cut 300 jobs from its MRO business, as well as AAR Duluth's decision to permanently close due to a drop in aircraft MRO demand. Furthermore, according to Afiq Aziz (2020), the Ministry of Investment, Trade and Industry (MITI) anticipated a 10% to 15% rise in total aviation industry growth in 2019, however, the future business projection were uncertain following the COVID-19 pandemic.

The economic development and sustainability of the aviation business are questionable as worldwide is dealing with the COVID-19 pandemic with travel restrictions implemented leading to most aircraft being grounded this had a direct influence on airliner and MRO organisation business management (Surfeo, 2023). Similarly, it has a detrimental influence on the expansion of the aircraft MRO organisation, resulting in restructuring and layoffs (Shaheera Aznam Shah, 2020). As a result of the lack of clarity on market demand and business management during this pandemic, this paper contributes business management insight from aviation professionals for Malaysian aircraft MRO organisations affected by the COVID-19 pandemic to improve their business value.

2.0 Literature review

To gain a thorough understanding of the current situation and the underlying problem of the paper topic, thematic data collection via literature review was carried out focusing on Aircraft maintenance business management and needs in the Malaysian market, as well as the CoronaVirus Disease 2019 (COVID-19) pandemic challenges on Malaysia MRO business before commencing data collection from aviation professional

2.1 Aircraft Maintenance Business Management and Needs in the Malaysian Market

The aviation development, which is felt throughout the Asia Pacific region as a result of the substantial population and the percentage of that population that now has sufficient financial resources to make air travel a viable option, well-managed airlines will succeed in the region, where Asia is projected to generate roughly 40% of potential airliner demand (Aviation Business News, 2017). According to an airport operator statement, the growth rate surpassed the 4.9% target established by MAHB for 2019. International passenger traffic climbed by 6.2% to 67.34 million from 63.38 million in 2018, while domestic passenger traffic increased by 5% to 73.3 million from 69.78 million in 2018 (Syahirah Syed Jaafar, 2020).

The increase in passenger travel supports the increase in aircraft utilisation, which in turn supports the increase in aircraft Maintenance, Repair and Overhaul (MRO) organisation business management, as the aircraft MRO organisation is required to perform maintenance and it contributes to the aircraft maintenance businesses by keeping aircraft in airworthiness condition (Republic Jet Center, 2023). According to SATAIR (2021), airworthiness refers to all the processes that ensure that the aircraft, at any moment during its operational life, complies with the current airworthiness regulations and is in a safe operating condition. This supports the aircraft MRO organisation in improving the businesses the organisation can perform certain maintenance activities on a specific aircraft to maintain the aircraft's airworthiness (SATAIR, 2021). Furthermore, as part of the procedure to control and mitigate the spread of COVID-19 viruses, the National Aviation Authority has issued the COVID-19 guidelines for the aviation industry, which provide overall disinfection procedures as well as airworthiness guidance specific to disinfection measures on maintenance aircraft (Civil Aviation Authority of Malaysia, 2020).

In addition, the Ministry of Investment Trade and Industry (2023), stated the Malaysian Aerospace Blueprint 2030 emphasises the MRO organisation, ground systems, simulators and ground set equipment as one of the key sub-sectors and it is noted that Malaysia is on track to become the leading aerospace nation in Southeast Asia and a key player in the global market by 2030, with annual revenues of Malaysian Ringgit (RM) 55.2 billion with creating of more than 32000 high-paying jobs. Furthermore, the MRO sector is anticipated to capture at least 5% of the worldwide market share by 2030 to support this goal (Ministry of Investment Trade and Industry, 2023). The value of market growth for MRO is classified as necessary by the Malaysia Aerospace Industry Blueprint 2030 to spur national growth, therefore the aircraft maintenance business management is critical to boosting the business value for the aircraft MRO organisation as it is a sub-sector in the Malaysian Aerospace Industry Blueprint 2030 (Ministry of Investment Trade and Industry, 2023).

2.2 The CoronaVirus Disease 2019 (COVID-19) pandemic challenges on Malaysia MRO business

Air travel is expected to expand in 2019 owing to several variables including, but not limited to, tourism, freight and medical transport. In the second quarter of 2019, Malaysian tourist arrivals climbed by 7.2% year on year (Malaysian Aviation Commission, 2019). Even though there is a demand for aircraft management activities due to utilisation and maintaining aircraft airworthiness conditions, the quarterly passenger traffic trend shows a reduction in the first quarter of 2020 due to travel bans imposed by various nations, including Malaysia. (Malaysian Aviation Commission, 2020). The effects of the CoronaVirus Disease 2019 (COVID-19) pandemic on the aviation industry were detrimental to the development of the industry's businesses and air travel, thus aircraft maintenance providers took extreme measures such as retrenchment due to revenue losses. (Nur Hanani Azman, 2020). Existing Maintenance, Repair and Overhaul (MRO) organisation business management methods are no longer the same as they were before the COVID-19 pandemic, necessitating new business management methods to survive and remain profitable in the present and future market conditions.

On the other hand, Afiq Aziz (2020) stated that the Ministry of International Trade and Industry (MITI) anticipated a 10% to 15% increase in total aviation industry growth in 2019 and that aircraft MRO organisations could benefit from maintaining the cargo aircraft as the cargo fleet filling up the demand to transport the COVID-19 health and medical supplies worldwide. However, he also noted that with the COVID-19 pandemic, the aviation industry lacks a precise projection for future demand and business value (Afiq Aziz, 2020). Furthermore, despite the MRO organisation services for both commercial and private jets remaining operational to support grounded aircraft during the COVID-19 pandemic, the business's value still experienced a 30% reduction in overall operations (Ayisy Yusof, 2020). According to Jamie Freed (2021), under the COVID-19 exemptions from aircraft manufacturers and regulators, airlines with aircraft grounded by the pandemic are saving money by postponing maintenance tasks like replacing life jackets,

testing oxygen bottles and inspecting emergency exits, therefore this further impact the business value recovery of aircraft MRO organisation.

Outcomes of the literature reviews, the aviation sector was on the edge of bankruptcy and some organisations had to restructure in order to lay off employees. Additionally, aircraft will be grounded if travel restrictions are in effect, which will lower the demand for aircraft maintenance and put pressure on the aircraft MRO organisation's business value. However, even if aircraft are grounded, the aircraft still require certain maintenance and there is a business demand for cargo fleets, therefore aircraft MRO organisations have a small possibility of surviving this pandemic effect provided an effective business management method is in place.

3.0 Methodology

The data for this paper was obtained from a literature review and a qualitative semi-structured survey questionnaire. The literature review provides theoretical data from many sources focused on aviation maintenance business management and needs in the Malaysian market, as well as the CoronaVirus Disease 2019 (COVID-19) pandemic challenges on Malaysia Maintenance, Repair and Overhaul (MRO) organisations. The qualitative semi-structured survey questionnaire has been distributed to targeted focus group aviation professionals with more than ten years of experience with or without an experience in aircraft MRO environment based in Selangor, Malaysia. The finding provides post COVID-19 industry insight into business management for improving business value for Malaysian aircraft MRO organisations. These findings were analysed using the NVivo tool as the NVivo software can use specialized queries to identify trends and develop themes and points of view to reach conclusions QSR International (2022). Therefore, the qualitative semi-structured survey questionnaire data were analysed using NVivo software for better data compilation and management to achieve industry insight into pandemic impact and relevant business management for aircraft MRO organisations. Figure 1.1 illustrates the methodological framework of the paper to fulfil the paper's aim of proposing post COVID-19 pandemic business management to Malaysian aircraft MRO organisations affected by the pandemic in order to improve business value.

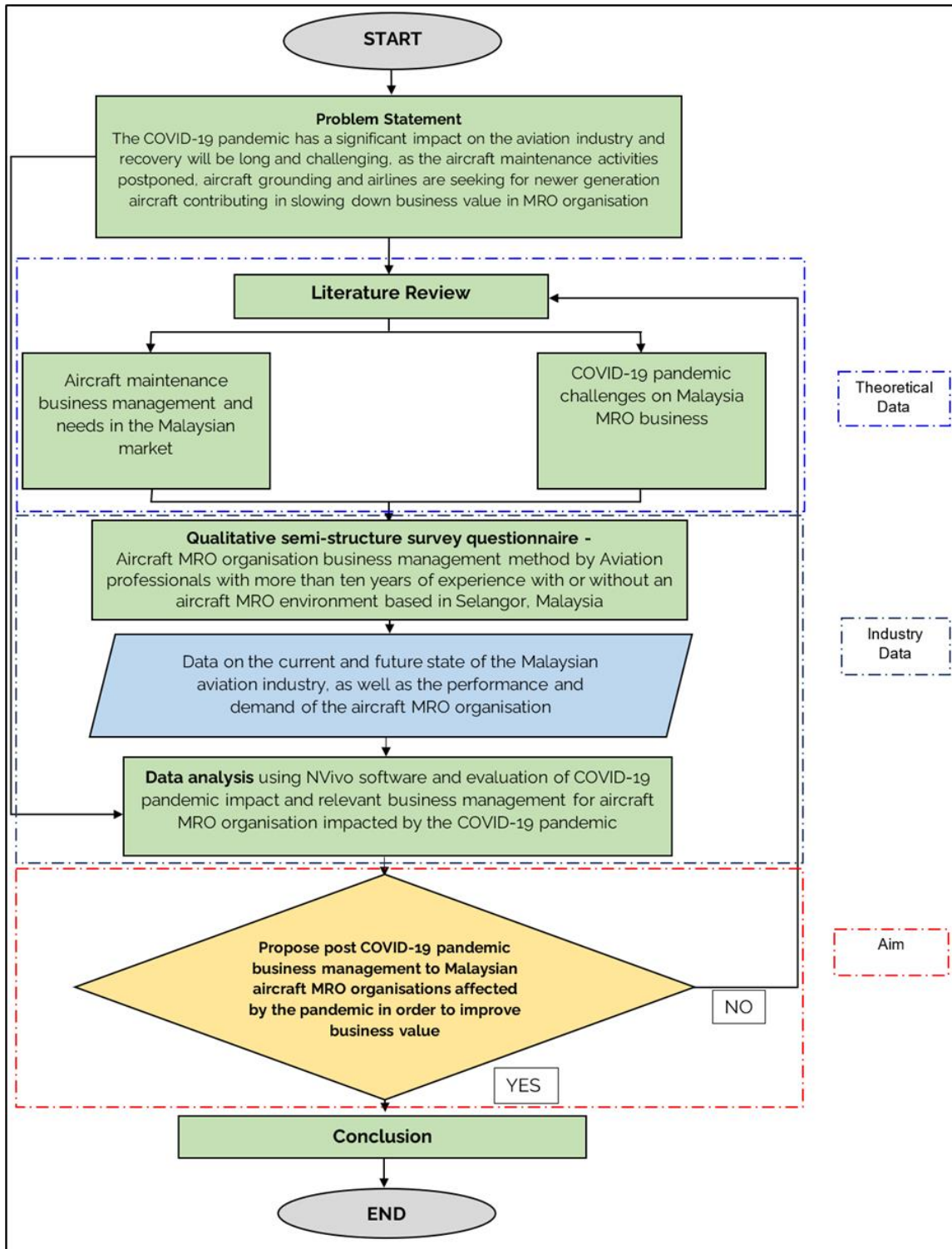


Figure 1 *Error! No text of specified style in document..2*: Methodological Framework of the Paper

As shown in Figure 1.1, the paper was developed methodically throughout various stages, starting with the formulation of the problem statement and continuing with the gathering of data with a focus on theoretical and industry research. The data gathered were then analysed with NVivo software to identify useful and effective business management methods that are believed to provide a significant impact towards the aim of the paper.

4.0 Data Collection

Focus group discussion with small number of responder or participant can reach saturation in data, therefore for this study certain levels of positions, such as Director, Section Head, Manager,

Licence Aircraft Engineer, Certifying Holder, Team Leader, Workshop Supervisor or Executive and with more than ten years of experience with or without an aircraft MRO environment based in Selangor, Malaysia, were selected as an aviation professional to gather current valuable information (Hennink & Kaiser, 2022). Table 1.1 shows the demographic information of selected aviation professionals.

Table 1.4: Respondent demographic information

Respondent No.	Position	Sector	Working Experience	Education	Professional Licence
1	Head of Engineering	MRO	33 Years	MBA	Aviation AML, CAA UK AML, FAA A&P IA
2	Head of Maintenance Control Centre	Airline	32 Years	Undergraduate Degree	AMEL (MY, EU, FAA, HK)
3	Quality Assurance Inspector	MRO	16 Years	Diploma Aircraft Technology	CAAM AMEL
4	Supervisor Workshop	MRO	14 Years	Diploma in Aircraft Maintenance (Composite)	Certified Technician (MBOT)
5	Asst. Manager Project & Process Engineering	Airline / MRO	12 Years	MBA	CAAM AMEL Cat B1 & Cat C

According to McGrath et al. (2019), a qualitative semi-structured interview permits open-ended questions during the interview session, enabling the interviewer to investigate topics brought up by the interviewee using one or a few predefined questions. However, Hennink & Kaiser (2022) mention that qualitative interview data saturation is the point in data collection when no new problems or insights are found and data starts to repeat, indicating that an acceptable sample size has been reached. Saturation has become a crucial part of qualitative research, assisting in the acquisition of strong and reliable data (Hennink & Kaiser, 2022). Considering this, it is seen that the data collected from five respondents representing various organisations exhibits a similar pattern. Thus, additional data collection is not required to contribute to new findings from the same questionnaire.

5.0 Result and Discussion

As a discussion from previous study, the literature review found that there is now no reliable outlook for the aviation sector's future (Afiq Aziz, 2020), in addition which has negatively impacted the aircraft Maintenance Repair Organisation (MRO) company (David Stewart et al., 2020). Looking at the Malaysian Aerospace Industry Blueprint 2030 the Ministry of International Trade and Industry projected to secure 5% of the global MRO market by 2030 is facing challenges since the COVID-19 pandemic is hurting most of the aviation business (Ministry of Investment Trade and Industry, 2023). On the other hand, due to the aviation authority's airworthiness guidance which needs to undertake aircraft disinfection to avoid COVID-19 virus spreads (Civil Aviation Authority of Malaysia, 2020), thus these have positive business development for certain aviation business company which focusing on aircraft disinfection businesses.

As to gain the current industry professional insights, the questionnaire focused on aircraft maintenance business management and needs in Malaysia, the CoronaVirus Disease 2019 (COVID-19) pandemic challenges on Malaysia Maintenance Repair and Overhaul (MRO) organisation business and aircraft MRO organisation business management method by aviation professionals. Examining aircraft maintenance business management and needs in the Malaysian market, the purpose of this theme is to identify the current aircraft MRO organisation business management with the aviation industry's future projection. Furthermore, the COVID-19 pandemic challenges Malaysian MRO organisations, this theme is to examine the challenges of the COVID-19 pandemic to the aircraft MRO organisation. Subsequently, aircraft MRO organisation business management by aviation professionals, the purpose of this theme is to propose effective business management

methods to Malaysian aircraft MRO organisations affected by the COVID-19 pandemic to improve business value. Consequently, the results are retrieved by narrowing themes to establish the paper's aim.

5.1 Qualitative semi-structure survey questionnaire

The questionnaire was developed and distributed to aviation professionals to obtain current aviation industry insight, with a focus on aircraft Maintenance, Repair and Overhaul (MRO) organisations, to determine effective business management for Malaysian aircraft MRO organisations affected by the CoronaVirus Disease 2019 (COVID-19) pandemic and to improve business value.

5.2 Can you briefly describe the operation of your organisation towards aviation industry development and the collaboration with government agencies and aircraft training providers

According to the responses, each respondent's organisation focuses on a different business operation, such as but not limited to providing airline, aircraft maintenance services, cargo logistics, providing full maintenance work major and minor scheduled maintenance, modification, repair, avionics upgrade, system installation and component repair and maintenance for helicopter blades. Additionally, respondents acknowledge the significance of working with government agencies. However, some respondent organisations only deal as customers from time to time with aircraft training providers when it comes to collaboration between respondent organisations with these providers.

5.3 Do you think the aircraft MRO business is essential in Malaysia

Responders agreed that aircraft Maintenance, Repair and Overhaul (MRO) is crucial in Malaysia because it draws investments and offers a variety of economic benefits with the support of a government goal as part of the Malaysian Aerospace Industry Blueprint 2030 and a dedicated aerospace division Selangor Darul Ehsan Aerospace Industry Coordination Office by the Selangor state government.

5.4 If so, how does your organisation accommodate the demand for aircraft MRO business

Three respondents mentioned having business management in place to support the expansion of their Maintenance, Repair and Overhaul (MRO) business which included, but was not limited to, forecasting and planning to optimise business operations and cost efficiencies, focusing on aircraft maintenance services as well as repair or modification beyond Original Equipment Manufacturer (OEM) limitations as their business target segment and empowering the quality by OEM standard. On the other hand, respondent number two mentioned currently the organisation concentrating on their primary core business but wants to go into other business values once the aviation MRO market starts to pick up. The fifth respondent generally mentioned to fulfil the growing demand, capacity and skills must be enhanced.

5.5 What are the COVID-19 Pandemic Challenges for Aircraft MRO Business, including but not limited to; Operation, Management, Maintenance, Revenue and Achieving Government Deliverables such as the Malaysia Aerospace Industry Blueprint 2030

Most responders say that business operations are being interrupted and that profit is dropping, which has led to employee layoffs. Since the majority of the aircraft were grounded this reduced profitability and disrupted the momentum to achieve the goals set down in the Malaysia Aerospace Industry Blueprint 2030. Additionally, due to limited resources and expense allocation, aircraft safety may be compromised if an aircraft does not meet aviation authority criteria during the CoronaVirus Disease 2019 (COVID-19) pandemic phase and aircraft operation re-activation. In contrast, helicopter-related businesses surviving the COVID-19 pandemic because there is continuous demand from frontline personnel and medical supplies logistics.

5.6 What are the planned strategies to support the development of post COVID-19 pandemic recovery on aircraft MRO business

Responders mentioned various business management methods for surviving the CoronaVirus Disease 2019 (COVID-19) pandemic, including but not limited to, selling more corporate jets is one method, together with creating a plan for business management that includes an all-inclusive package for maintenance of the aircraft. This business management method will help to increase business profits while also improving the income stream for national aviation as supply and demand balance out at the right level. Additionally, responders' welcome government assistance in streamlining regulations for aircraft re-activation without compromising aircraft safety, as this would help reduce costs corresponding to operational expenditures since the aircraft were still maintained under authority regulations, even though the aircraft were grounded for extended periods.

5.7 How does your organisation engage with government agencies and aircraft training providers to boost business growth

All respondents agreed that engaging with government agencies such as including but not limited to Malaysian Investment Development Authority, National Aerospace Industry Corporation Malaysia and academic institutions is crucial for promoting business development. These engagements enable the business to establish and sustain a positive reputation with investors and customers because they show that the organisation is committed to upholding high-quality standards.

5.8 Do you think organisation engagement with government agencies and aircraft training providers will boost aircraft MRO business growth

The majority of respondents agreed that government support is necessary for the aviation sector and to improve the aircraft Maintenance, Repair and Overhaul (MRO) businesses because it may entice international investors to invest in Malaysia. One of the responders highlights that governmental agencies and ministries may support and encourage aircraft maintenance and MRO businesses through budgetary and policy measures. Policies that support the temporary or long-term provision of aircraft MRO services to foreign airlines increase not just the earnings of aircraft MRO businesses but also the amount of foreign currency investment into the nation. Another business management method suggested was to get managerial and technical professionals from other countries to build and sustain substantial aviation MRO operations, as these professionals could promote Malaysian aircraft MRO organizations to their country and networks. At the same time, business management method suggests that good engagement with training providers is required to develop and maintain competent workforces. In addition to all the suggestions, the business management will only be effective if it fulfils the standards and requirements of the Civil Aviation Authority Malaysia.

5.9 Proposed aviation professional business management method using NVivo analysis

NVivo was used to analyse the questionnaire to identify the word frequency among the respondents. Several words were commonly mentioned by all respondents, including but not limited to aircraft, CoronaVirus Disease 2019 (COVID-19), aviation, Maintenance, Repair and Overhaul (MRO), business, training, maintenance, Malaysia, industry and government. The most used words indicate that all respondents agree that aircraft maintenance and repair are crucial and support national economic growth. Furthermore, regarding the government agencies' engagement, all respondents agree that government support in various methods, including but not limited to economic support, facilitating foreign investors and revisiting aircraft reactivation procedures by national aviation authority to assist in aviation at the same not jeopardizing aircraft safety. However, certain responders mentioned not engaging directly with aircraft training providers, meanwhile only engaging with training providers from time to time. Figure 1.2 illustrates the NVivo word frequency highlight.

was successfully completed by obtaining current insight into the Malaysian aviation industry from aviation professionals, as well as several business management methods to improve the business value of Malaysian aircraft Maintenance, Repair and Overhaul (MRO) organisations affected by the CoronaVirus Disease 2019 (COVID-19) pandemic. The COVID-19 pandemic has had both positive and negative effects on Malaysian aviation businesses, as evidenced by the majority of commercial passenger business value has suffered losses due to movement control orders, however, the helicopter and cargo associated business value has increased as the operations were used to support frontliners and logistics.

This study provides valuable and current information on Malaysian aviation, with an emphasis on the aircraft MRO organisation's business value. For aviation business owners and managers, the proposed business management method can be advantageously used to comprehend the current issue and amend the way it operates following the current business trend to better meet customer expectations.

For government agencies, this study will be beneficial in understanding the difficulties faced by the aviation industry, business losses resulting from aircraft grounding and aircraft maintenance expenses required to keep aircraft airworthy. Government agencies could provide support through budgetary or policymaking by considering the limitations of aviation businesses without jeopardising the safety of aircraft.

For academia, this study contributes to the literature by revealing the aircraft maintenance business management and needs in the Malaysian market, the COVID-19 pandemic challenges on Malaysia MRO organisation business value and aviation industry insight with business management methods to improve the business value of Malaysia MRO organisation affected by COVID-19 pandemic. Additionally, this study enables an understanding of how the COVID-19 pandemic impacted Malaysian aviation organisations with an emphasis on aircraft MRO organizations.

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