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Critical Success Factors in Aircraft Component-Supporting Industry in Indonesia A Literature Review

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Abstract: *The aircraft component support industry has the potential to be further developed. This industry is expected to contribute to improving the national economy. Critical Success Factors (CSFs) have been the subject of many studies; however, there is still a research gap regarding the aircraft component support industry. This study aims to address this gap. This qualitative research used online data. The data considered include articles published before February 2022. The search strategy focused on 2 keywords, namely critical success factors (CSFs) and the manufacturing industry. After identification and review, 13 studies were identified and included in the analysis. The primary factor analyzed was the critical success factors (CSFs). The purpose of this study was to identify critical success factors (CSFs) from previous studies to be applied to the aircraft component support industry. This study produced 4 dimensions and 20 critical success factors (CSFs). The four dimensions are industry, government, technology, and customer. Critical success factors (CSFs) are needed by the aircraft component-supporting industry to determine the formulation of policy strategies to improve performance and productivity. Similar to previous studies, this study has limitations. Due to time constraints, the method used was a literature review. This study offers significant implications as a basis for future research into the critical success factors (CSFs) of the aircraft component-supporting industry. The practical implications of this study are to provide critical success factors (CSFs) for an industry for policy makers, leaders, and decision makers. Therefore, they can determine the most appropriate policy formulation. Future research is expected to further refine the qualitative approach by conducting in-depth interviews with experts.*

Keywords: *critical success factors (CSFs), aircraft components, industry, policy, government, technology*

I. INTRODUCTION

The aerospace industry is critical to global connectivity. A well-established aerospace industry can address the challenges related to supply chains related to aircraft spare parts, efficient maintenance, repair, and overhaul (MRO) services, and aircraft operations (Imam B, 2022). As an international industrial sector, the aerospace industry has advanced national and international technological, economic, and social growth among nations (Akbarli et al., 2022). As air traffic increases throughout the world and development in developing countries place great pressure on the aircraft supply chain regarding the availability of spare parts (Cros, 2022).

Aircraft component-supporting industries produce spare parts according to aircraft component manufacturer specifications. This industry has a special production certification and is only responsible for compliance with applicable regulations (Imam B, 2022). The aircraft component support industry is an industrial sector with potential to be developed using global supply chains. This industry is expected to contribute to improving the national economy. The aerospace industry is Indonesia's leading producer of high-technology products and can play a role in the global value chain of the world aerospace industry (Harsudiono et al., 2022)

Indonesia has an aerospace industry, namely PT Dirgantara Indonesia (PT DI). PT DI is the only aircraft component industry in Indonesia that is fully owned by the Indonesian Government (Putra et al., 2018). The

aviation industry in Indonesia, which currently relies on PT Dirgantara Indonesia, can begin to share its component manufacturing workload with competent domestic aircraft component support industries. The development of the aircraft component support industry needs to be carried out to support the supply of engine, aerostructure, and avionics/electrical system components. This scheme was adopted by Boeing and has been proven effective in advancing the aerospace ecosystem (Harsudiono et al., 2022). Huge opportunities for the development of aircraft component-supporting industries in Indonesia remain wide open because Indonesia's vast territory requires a reliable national transportation system to support economic growth, development, and connectivity between regions.

The development of the aircraft component-supporting industry can be achieved by knowing the Critical Success Factors (CSFs). According to Bullen & Rockart (1981), Critical Success Factors (CSFs) are crucial factors for the success of a company so that its business grows and its goals are achieved. Meanwhile, according to Müller & Turner (2007), to achieve the success of a program, companies need to develop strategies, identify what stakeholders want and know what success factors can make this happen.

Critical success factors (CSFs) have been extensively described in prior research. Wahab et al (2020) identified critical success factors in the manufacturing industry, Maulana & Raharjo (2021) identified the determining factors for success in the telecommunications industry. In the automotive battery industry, Mauricio & Jabbour (2017) highlighted critical success factors. Meanwhile, Mathew & Pretorius (2017) determined critical success factors (CSFs) for the electric power sector's performance. For oil firms, Tsiga et al. (2017) identified critical success factors (CSFs).

The Ministry of Industry recorded the potential for aircraft component-supporting industries in Indonesia in 2015. There are 47 industries that have been given technical guidance by the Ministry of Industry. Currently, of the 47 industries, less than 5% survive to support the aircraft components industry (Ministry of Industry, 2015). The Ministry of Industry initiated the establishment of the *Indonesian Aircraft and Component Manufacturers Association* (INACOM) with the aim of supporting the provision of domestic aircraft production components and to become an important part of the global supply chain in the world aircraft industry.

This study aims to identify Critical Success Factors (CSFs) from previous studies to provide recommendations for policy makers, leaders, and decision makers in the aircraft component support industry. The results of a review of previous research indicate a lack of research on the critical success factors of aircraft component-supporting industries in Indonesia. The primary contribution of this research is the identification of the critical success factors (CSFs) of aircraft component-supporting industries to achieve and maintain optimal performance to compete in the global value chain.

II. METHODOLOGY

Managers and planners identify, determine, and sort important factors to determine the survival and success of an industry or organization, which can be assisted by the critical success factors (CSFs) technique (Bouknight, 2004). To identify the essential elements of any program or technique's performance, critical success factors (CSFs) are widely employed in various academic disciplines (Hibadullah et al., 2014). Rashid et al., (2018) identified 6 of the best success factors in the emerging aircraft industry: clear business vision, knowledge management and reuse, top management support, vendor cooperation and support, project management, and communication.

This study employed 13 journals, and the literature review findings address critical success factors (CSFs) in the industrial sector. The outcomes of this literature review will serve as a guide for implementing the critical success factors (CSFs) discovered in Indonesia's aircraft component-supporting industry. Table 1 shows the critical success factors (CSFs) derived from the literature review.

TABLE I
COMPARISON OF SEVERAL RESEARCHES ON CRITICAL SUCCESS FACTORS (CSFs).

No	Researcher Name	Quantity of CSF	Methods for Identification and Evaluation (CSFs)
1.	(Rehman et al., 2015)	12	Literature Survey
2.	(Sivakumaran et al., 2015)	17	Expert Interviews
3.	(Liang et al., 2016)	19	gray DEMATEL
4.	(Kabak et al., 2016)	27	Fuzzy DEMATEL
5.	(Rodríguez-Segura et al., 2016)	5	Fuzzy-set Qualitative Comparative Analysis (FsQCA)
6.	(Mauricio & Jabbour, 2017)	7	Expert Interviews
7.	(Tsiga et al., 2017)	11	Literature Review
8.	(Wahab et al., 2020)	6	Literature Review
9.	(Nurbossynova et al., 2021)	22	Literature review
10.			

The critical success factors (CSFs) in the manufacturing industry from 2015 to 2022 are explained in the literature study in Table 1. The critical success factors (CSFs) identified in each study differ due to differences in companies, goals, and company characteristics. Critical success factors (CSFs) are determining factors that guarantee the success of an organization's competitive performance and are effective factors in achieving success (Bullen & Rockart, 1981). Previous research has used different methods to evaluate and identify critical success factors (CSFs), namely using Literature Survey, Expert Interview, Green Dematel, Fuzzy Dematel, Fuzzy-set Qualitative Comparative Analysis (fsQCA), Literature Review, Principal Component Analysis (PCA), Interpretive Structural Modeling (ISM), and Matriced Impacts Croises Multiplication Application and Classement (MICMAC) techniques.

III. ANALYSIS AND RESULTS

Following a review of the literature, 13 prior studies were classified into categories based on the aspects of critical success factors (CSFs). Based on earlier studies, critical success factors (CSFs) and their dimensions were identified, examined, and grouped in this study. The aerospace component-supporting industry can apply the critical success factors (CSFs) identified in this research. Table 2 lists the critical success factors (CSFs) and their dimension.

TABLE 2
CRITICAL SUCCESS FACTORS (CSFs) LITERATURE REVIEW

Dimen-sions	Critical Success Factors (CSFs)	Source
Industry		(Nurbossynova et al., 2021); (Tsiga et al., 2017) ; (Wahab et al., 2020) ; (Maulana & Raharjo, 2021)
Management Support		(Nurbossynova et al., 2021); (Paul et al., 2022); (Hakim et al., 2021) ; (Mauricio & Jabbour, 2017) ; (Tsiga et al., 2017); (Rehman et al., 2015); (Kabak et al., 2016).
Management Competency		(Nurbossynova et al., 2021); (Tsiga et al., 2017); (Wahab et al., 2020); (Maulana & Raharjo, 2021); (Rodríguez-Segura et al., 2016); (Kabak et al., 2016); (Hakim et al., 2021); (Mohanta & Mahanty, 2021).
Team Competency		(Nurbossynova et al., 2021); (Tsiga et al., 2017); (Wahab et al., 2020); (Maulana & Raharjo, 2021); (Mauricio & Jabbour, 2017); (Kabak et al., 2016); (Hakim et al., 2021);
Team Composition		(Nurbossynova et al., 2021); (Tsiga et al., 2017); (Mauricio & Jabbour, 2017); (Rehman et al., 2015);
Contractual Aspects		(Tsiga et al., 2017);
External Challenges		(Tsiga et al., 2017);
Financial Factors		(Nurbossynova et al., 2021); (Hakim et al., 2021); (Sivakumaran et al., 2015); (Liang et al., 2016);

TABLE 2
CRITICAL SUCCESS FACTORS (CSFs) LITERATURE REVIEW (CONTINUE)

Dimen-sions	Critical Success Factors (CSFs)	Source
Govern-ment	Government Support	(Nurbossynova et al., 2021); (Maulana & Raharjo, 2021); (Rehman et al., 2015); (Nurbossynova et al., 2021); (Hakim et al., 2021); (Liang et al., 2016); (Rodríguez-Segura et al., 2016); (Paul et al., 2022); (Talib et al., 2015); UU no 1 2009;
	Coordination and cooperation between industry and government	(Liang et al., 2016); (Paul et al., 2022); (Talib et al., 2015); (Kabak et al., 2016);
	Infrastructure	(Kabak et al., 2016);
	Easy financing and taxation facilities	(Kabak et al., 2016); Law no 1 2009
	Research and Technology	(Talib et al., 2015);
Techno-logy	Infrastructure and technological availability	(Nurbossynova et al., 2021); (Paul et al., 2022); (Kabak et al., 2016); (Hakim et al., 2021); (Mohanta & Mahanty, 2021); (Khan & Narawane, 2011); (Nurbossynova et al., 2021); (Paul et al., 2022); (Mauricio & Jabbour, 2017); (Kabak et al., 2016); (Hakim et al., 2021); (Mohanta & Mahanty, 2021); (Rehman et al., 2015);
	Technological reliability	(Nurbossynova et al., 2021); (Paul et al., 2022); (Kabak et al., 2016); (Mohanta & Mahanty, 2021);
Custo-mers	Customer support	(Nurbossynova et al., 2021); (Paul et al., 2022); (Rodríguez-Segura et al., 2016); (Hakim et al., 2021); (Nurbossynova et al., 2021); (Paul et al., 2022); (Rodríguez-Segura et al., 2016);
	Product quality	(Paul et al., 2022); (Khan & Narawane, 2011) ; (Hakim et al., 2021); (Kabak et al., 2016); (Duy & Hoang, 2017);
	Market Conditions (Potential Market and Market Dynamics)	(Sivakumaran et al., 2015); (Hakim et al., 2021); (Kabak et al., 2016);
	Price Appropriateness	(Khan & Narawane, 2011); (Duy & Hoang, 2017); (Hanif et al., 2010);
	Service Quality	(Duy & Hoang, 2017); (Hanif et al., 2010);
	Emotional Factors	(Khan & Narawane, 2011);

The following stage was to develop a critical success factors (CSFs) framework to rank the CSFs in Indonesia's aircraft component support industry after classifying the CSFs and their dimensions according to a literature review. The industry needs these Critical success factors (CSFs) to formulate policy measures to increase productivity and performance.

The results of the literature review obtained 4 dimensions consisting of Industry, Government, Technology and Customers. For critical success factors (CSFs), 20 factors were obtained: management support, management competence, team competence, team composition, contractual aspects, external challenges, financial factors, government support, coordination/cooperation between industry and government, infrastructure, convenience. financing and taxation facilities, research and technology, infrastructure and technological availability, technological reliability, customer support, product quality, market conditions (market potential and market dynamics), product quantity, price appropriateness, service quality, and emotional factors. The findings of this literature analysis offer a framework that professionals can use to verify critical success factors (CSFs), which can then be used as suggestions for Indonesia's aircraft component-supporting industry. Table 3 presents the Critical success factors (CSFs) framework.

TABLE 3
CRITICAL SUCCESS FACTORS (CSFs) FRAMEWORK FOR THE AIRCRAFT COMPONENT-SUPPORTING INDUSTRY

Dimensions/parts	Defining factor
Industry	
	Management Support
	Management Competency
	Team Competency
	Team Composition
	Contractual Aspects
	External Challenges
	Financial Factors
Government	
	Government Support
	Coordination and cooperation between industry and government
	Infrastructure
	Easy financing and taxation facilities
	Research and Technology
Technology	
	Infrastructure and technological availability
	Technological reliability
Customer	
	Customer support
	Product quality
	Market Conditions (Market Potential and Dynamics)
	Product Quantity
	Price Appropriateness
	Service Quality
	Emotional Factors

IV. DISCUSSION

This study identified four dimensions and 20 critical success factors (CSFs) after identifying, classifying, and analyzing the literature. The results of this research were validated using the Delphi method with experts. The results of interviews with these experts will determine the critical success factors (CSFs) according to the characteristics of the aircraft component-supporting industry in Indonesia. The next research stage involves conducting interviews with experts to determine the relationships among factors, rankings

among factors, and formulation recommendations. The correct recommendations will provide an optimal strategy for the aircraft component support industry. It is hoped that this research will provide benefits for researchers who are interested in researching in the manufacturing sector, especially the aircraft component support industry, in determining critical success factors (CSFs).

V. CONCLUSION

Based on the researcher's name, the study's year of publication, number of Critical Success Factors (CSFs), and methods used in research on the manufacturing industry, this research classifies 13 prior studies. The study's findings produced four dimensions and 20 critical success factors (CSFs), which can serve as a foundation for the following steps. The proposed framework can be used to determine rankings and strategies for aircraft component-supporting industries in Indonesia. The absence of validation testing for critical success factors (CSFs) is the research's main drawback. It is hoped that the critical success factors (CSFs) identified in this research can be used as a reference for industry in various fields to determine the industry's future strategy. Some of the challenges facing the aircraft component-supporting industry are unsustainable demand, demand that is not in large quantities, and certification.

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