

# Chapter 10

## The Aerospace Industry: A Country's Developmental Framework

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### **ABSTRACT**

*Man has always been fascinated with flight. Since the Greek mythology character Icarus flew towards the sun in his crafted wings and fell to his death, early men dared to conquer the skies with often disastrous results. The dawn of aviation came when the Wright brothers flew the first heavier-than-air machine along the dunes of Kitty Hawk, North Carolina, in 1903. Soon, newly invented flying machines began to be used in sports and air shows. When the Great War broke out in 1914, machine guns were mounted on primitive aircraft, and airplanes became weapons of mass destruction. Advances in aircraft design and development led to the invention of more sophisticated and deadly military planes, which became a potent force in warfare in World War II. When the first satellite, the Soviet Sputnik, flew in 1957, the world entered the space age. A race between America and Russia began during the Cold War, culminating with Neil Armstrong landing on the moon's surface in 1969. Man has gone beyond the Earth's atmosphere and into the far regions of outer space.*

### **INTRODUCTION**

This paper provides an overview of the global aerospace industry, with a particular focus on its implications for the manufacturing sector. It also presents an integrative framework that the Philippines follows to develop its aerospace capability, while striving to keep pace with its ASEAN neighbors. In its simplest form, the story of aerospace is a story about humanity's desire to achieve possibility at the core of

DOI: 10.4018/979-8-3373-1082-4.ch010

the human spirit. The aerospace industry today stands at a critical juncture. We are witnessing a recovery in passenger traffic around the world; private launch providers are facilitating access to space; and governments are redefining security strategies in a world of shifting alliances. Despite the noise of turbines and the plumes of rockets, there is a quieter engine of change that drives the economy: manufacturing. Aircraft manufacturers now have to develop lighter airframes, fault-tolerant avionics, and propulsion systems that sip rather than guzzle fuel, and these factors determine which countries capture value and which countries merely purchase it. The manufacturing of aerospace products has never been an easy task. There are millions of individual parts used in modern aircraft that are sourced from a constellation of suppliers that span multiple time zones, tiers, and regulatory regimes that are spread across the globe.

Artificial intelligence is revolutionizing aviation through applications such as predictive maintenance and passenger experience enhancements (Addepto, n.d.). The initial aerospace manufacturing road map outlined foundational strategies for industry growth in the Philippines (Aerospace Industries Association of the Philippines, 2013). A decade later, the updated road map set new targets for export capacity and workforce development (Aerospace Industries Association of the Philippines, 2023). Aviation contributes significantly to global economic growth, supporting jobs and GDP worldwide (Air Transport Action Group, n.d.). Emerging urban air mobility solutions require integrated simulation frameworks to ensure safety and efficiency (Altair Engineering, n.d.). The Philippine aircraft maintenance market is expected to expand as post-pandemic travel demand rebounds (Balinbin, 2022). Participation in global value chains has positioned the Philippines as a competitive hub for certain aerospace components (Bamber et al., 2016). Tiered supply-chain structures help manage complex aerospace production networks (Bescast, n.d.). Government policy envisions the Philippines as an attractive location for aerospace investors (Department of Trade and Industry, n.d.).

Industrial park incentives support cluster formation for aerospace firms (First Philippine Industrial Park, 2023a). Diversification into electronics manufacturing complements aerospace capabilities (First Philippine Industrial Park, 2023b). Connected aircraft use IoT sensors to optimize flight operations and maintenance (Imaginovation, n.d.). IoT-enabled analytics can reduce turnaround times in airport operations (Joshi, n.d.). Industry leaders anticipate new growth drivers in the defense sector (KPMG International, 2016). Digital twins are transforming MRO processes into predictive, data-driven practices (Lahane, n.d.). Advanced composites and smart materials enhance aircraft performance and reduce weight (Mehra, 2023). NASA's research on electric-aircraft propulsion aims to lower emissions in future fleets (National Aeronautics and Space Administration, n.d.). The government has pledged full support for domestically produced satellites such as MULA (Presidential

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