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IMPACT OF AIRPORT STRUCTURE & TECHNOLOGY IN THE GROWTH OF AVIATION INDUSTRY: ANALYTICAL STUDY

SHAMASHAD BEGUM

Research Scholar, Ph. D in Aviation
CMJ University, Jorabat, Meghalaya.

ABSTRACT

THE STRUCTURE OF THE AIRPORT

- **Runways and Airports:** The efficient running of aviation operations depends on sufficient airport infrastructure, including well-planned runways and terminals. Congestion and delays are inevitable results of poorly maintained airports, which prevent airlines from operating aircraft efficiently.

- **The ATM System for Managing Air Traffic**: Aircraft safety and orderliness in flight are guaranteed by well-designed air traffic management systems. Communication networks, radar systems, and air traffic control towers are all part of this. Optimising airspace utilisation and reducing accident risk are two goals of an organised ATM framework.

- **Legal Structure:** Adherence to security protocols, safety requirements, and environmental laws is guaranteed by a strong regulatory structure. The FAA in the US and the EASA in Europe are regulatory agencies that keep an eye on the aviation industry and make sure everything is running smoothly and safely.

SCIENCE AND TECHNOLOGY

- **The Design and Manufacturing of Aircraft:** Aircraft designs that are less harmful to the environment and use less fuel have emerged as a result of technological advancements. Reduced operating costs and emissions are two outcomes of modern aircraft's incorporation of lightweight materials, aerodynamic advances, and efficient engines.

- **Navigational Aids:** Inertial navigation systems (INS) and the Global Positioning System (GPS) allow for very accurate monitoring and navigation of aircraft, which increases safety and decreases the need for ground-based navigation aids.

- **Methods of Communication:** Modern communication technologies, like data links and satellite-based communication, improve situational awareness for air traffic controllers and pilots by allowing for real-time information transmission between aircraft and between aircraft and the ground.

- **Security Measures:** By giving pilots up-to-the-minute information and warnings to avoid possible dangers, technological advancements like automated weather monitoring, collision avoidance systems, and terrain awareness and warning systems (TAWS) increase safety.

- **Maintenance and Operations:** Technology reigns supreme in the realm of aircraft repair and operation. Predictive maintenance systems monitor the health of planes through data analytics and sensor technology to spot potential issues before they escalate, hence minimising unplanned downtime and increasing reliability.

The expansion of the aviation sector is, in a nutshell, dependent on the introduction of state-of-the-art technology and the upkeep of existing infrastructure. Aviation safety, efficiency, creativity, and economic growth are all positively impacted by a well-organized system that is backed by cutting-edge technology.