The Evolution of Airline Operations in the Era of Digital Transformation

Asst. Prof. Darwin M. Catalan
Philippine State College of Aeronautics

Asst. Prof. Darwin M. Catalan *is an Assistant Professor IV at the Philippine State College of Aeronautics (PhilSCA) now the National Aviation Academy of the Philippines (NAAP)where he teaches courses in Aviation Information Systems under the Institute of Computer Studies (ICS).He earned his Bachelor of Science in Computer Studies, specializing in Airline Operations and Procedure, from the Philippine State College of Aeronautics and obtained his Master's in Public Administration major in Governmental Airport Administration from the Philippine State College of Aeronautics Institute of Graduate Studies, and is now taking up Master's of Information Systems at the University of Batangas.*

The airline operations have evolved over the last decade to become more efficient, cost-effective, and customer-oriented. Airlines are undergoing major operational changes due to digital transformation and customer demands for faster, safer, and more convenient air travel. Flight planning, maintenance management, passenger service, and revenue management are being digitized to optimize airline operations and allow managers to sustain success in today's dynamic aviation industry.

Digital advancements have allowed airline managers to make data-driven decisions about flight schedules/routes, staffing, and other day-to-day activities. An airline operations platform can consolidate information such as aircraft positions, booking data, weather forecasts, and other factors that impact daily operations. With real-time information analysis, airline managers can make quick decisions about where aircraft should fly, optimal pricing, fuel use, and staffing needs. This helps airline operators run their businesses more efficiently and cost-effectively.

Airline operators can now automate and predict several processes within their organizations by using artificial intelligence. Airlines use AI to predict passenger demands, optimize aircraft pricing, and provide passengers with AI chatbots. Airlines also use artificial intelligence (AI)

to better predict maintenance requirements. Aircraft can now transmit maintenance data that can be analyzed and used to predict mechanical problems. This helps airlines operate more safely by allowing them to schedule maintenance before problems occur, reducing unplanned maintenance and flight delays.

Flight plans can also be automatically generated using digital data on an airline's fleet and real-time events. An optimal flight schedule can be produced by considering multiple factors, including aircraft and crew availability, weather, airport capacity, and projected passenger demand. With digital tools that provide real-time monitoring of airline operations, managers can optimize flight schedules and quickly address operational issues to improve on-time performance.

The airline industry continues to improve the passenger experience by providing services that travelers can access digitally and use effortlessly. Passengers today want airline services to be fast and readily accessible. As a result, airlines have introduced new applications, self-service baggage kiosks, biometric boarding, and online check-in. This enables the automation of airport processes, eliminating long customer queues and improving the passenger experience. Airlines also use passenger data to provide personalized services and communicate with passengers on how and when they want to hear from them.

Because of digital transformation, airline operators can now use cloud technology to access critical data needed for day-to-day operations. With most critical data now stored in the cloud, airline operators can access real-time information from anywhere in the world. Information can be shared seamlessly between departments within an airline, airports, and airline operations centers worldwide. Cloud technology allows airlines to be more agile by improving business continuity and scalability.

While digital transformation in airline operations offers many advantages, it also opens up cybersecurity vulnerabilities. As airlines become more reliant on technology and automated information systems, cyber threats become more imminent. Passenger data can be breached,

and airlines can have their operations crippled by ransomware attacks. With airlines relying so much on technology, they must now factor cybersecurity into their strategy. Airlines should take extra precautions by implementing robust cybersecurity policies, training employees, and monitoring networks for vulnerabilities.

In the next decade, digital transformation will continue to shape how airlines operate. Technologies such as artificial intelligence, machine learning, the Internet of Things, blockchain, autonomous systems, and advanced analytics will play a significant role in airline operations. Airlines that understand how to utilize these technologies will gain a competitive advantage and be better equipped to lead in the future.