

Chapter 5

Enhancing Airport Business Services Using Big Data Analytics

Desmond Narongou

 <https://orcid.org/0000-0003-0815-025X>

Papua New Guinea University of Technology, Papua New Guinea

Zhaohao Sun

 <https://orcid.org/0000-0003-0780-3271>

Papua New Guinea University of Technology, Papua New Guinea

ABSTRACT

Big data analytics has become one of the most significant frontiers in academia and one of the most successful applications in industry. Globally, big data analytics are becoming increasingly crucial for driving the business performance of enterprises on global markets. Having thriving business models for airports is crucial to enhancing a commercial airport's viability. Utilizing big data analytics and its services remains a significant challenge for airports in developing countries. This chapter uses big data-driven research as a search methodology through various literature sources including practical case studies in airport and aviation analytics and their applications to airport business process and services. With this understanding to improve airport business models and to enhance airport services, the objective of this chapter is to examine how to enhance airport business services with big data analytics.

INTRODUCTION

Big data analytics has become one of the most important research frontiers in academia and one of the most significant applications in industries (Sun & Stranieri, 2021) (Gehavami, 2020) (Sallam, Richardson, Kronz, Sun, & Schlegel, 2021). The Gartner report identifies 12 strategic technology trends shaping the future of digital business, and data fabric deployments are among the first to be mentioned, doubling

DOI: 10.4018/978-1-6684-5959-1.ch005

Enhancing Airport Business Services Using Big Data Analytics

data utilization efficiency by 2024 while cutting the amount of time employees spend on managing data in half (Gartner, 2022).

According to a report titled “Big Data and Analytics Services Global Market Report 2022” by ReportLinker, it is projected that at a compound annual growth rate (CAGR) of 12.8%, the global big data and analytics services market is expected to grow from \$107.85 billion in 2021 to \$121.65 billion in 2022. Businesses are experiencing growth as a result of resuming operations and adapting to the new normal after recovering from COVID-19, which had previously caused restrictive containment measures such as social distancing, remote working, and the closure of commercial activities, posing operational challenges. In 2025, the market is expected to reach \$196.95 billion at a CAGR of 12.8% (Globe Newswire, 2022). COVID-19 has drastically impacted all business operations since 2020, and revolutionized how businesses operate and conduct their activities and to be self-sustaining in the long run. Diversifying its business streams is a direction to take when establishing resilient business models during such times as this.

Big data analytics (BDA) is a science and technology for organizing and analyzing big data, and discovering knowledge, insights, patterns and intelligence from big data, visualizing and reporting the discovered knowledge and insights for assisting decision making (Sun, Sun, & Strang, 2018).

The traditional airport’s primary functions of aeronautical business have been enhanced by a variety of commercial services, digital services, and equipment. In general, airports provide complementary commercial services, digital services, and follow parallel business paths - aviation and non-aviation, or aeronautical and non-aeronautical (Brilha & Nobre, 2019). Enhancing airport business services using BDA is a bigger part of the whole airport digital transformation process, enabled by digitization, connectivity, and data (Nau & Benoit, 2017) (Pell & Blondel, 2018).

Based on the above analysis, there are still research issues that needs to be addressed:

1. How can big data analytics (BDA) be a key partner in driving a sustainable airport business model?
2. How do airport business models and airport business services integrate with big data analytics?
3. What are the implications and challenges faced in a real business world in enhancing airport business services with BDA services?

This chapter will address these three issues. To this end, the remainder of this chapter is organized as follows: Section 2 reviews and discusses how airport big data and airport data analytics support airport business services and processes through a literature review based on big data driven small data analysis. Section 3 discusses aviation ecosystem, airport analytics, aviation analytics and discuss their interrelationships. Section 4 explores how to enhance airport business services with intelligent big data analytics as a service. Section 5 looks at the challenges for implementing and adopting big data analytics from a PNG perspective. Section 6 provides discussions and limitations for this research. Section 7 provides a conclusion to this chapter with future research work.

LITERATURE REVIEW

In this section, we use ”research as a search” and “big data-driven small data analysis” (Sun & Huo, 2021) to conduct the literature review for this research.

22 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/enhancing-airport-business-services-using-big-data-analytics/319513

Related Content

Application of Geographical Information System and Interactive Data Visualization in Healthcare Decision Making

Zhecheng Zhu (2016). *International Journal of Big Data and Analytics in Healthcare* (pp. 49-58).

www.irma-international.org/article/application-of-geographical-information-system-and-interactive-data-visualization-in-healthcare-decision-making/171404

Investigating the impact of Human Population and Population Pressure on Forest Biomass Dynamics Using Delay Differential Equations

- Dipeshand Pankaj Kumar (2024). *Exploring Medical Statistics: Biostatistics, Clinical Trials, and Epidemiology* (pp. 111-129).

www.irma-international.org/chapter/investigating-the-impact-of-human-population-and-population-pressure-on-forest-biomass-dynamics-using-delay-differential-equations/351168

A Multi-Objective Ensemble Method for Class Imbalance Learning: Application in Prediction of Life Expectancy Post Thoracic Surgery

Sajad Emamipour, Rasoul Saliand Zahra Yousefi (2017). *International Journal of Big Data and Analytics in Healthcare* (pp. 16-34).

www.irma-international.org/article/a-multi-objective-ensemble-method-for-class-imbalance-learning/197439

Analysis of Heart Disease Using Parallel and Sequential Ensemble Methods With Feature Selection Techniques: Heart Disease Prediction

Dhyan Chandra Yadavand Saurabh Pal (2021). *International Journal of Big Data and Analytics in Healthcare* (pp. 40-56).

www.irma-international.org/article/analysis-of-heart-disease-using-parallel-and-sequential-ensemble-methods-with-feature-selection-techniques/268417

Data Stream Mining of Event and Complex Event Streams: A Survey of Existing and Future Technologies and Applications in Big Data

Chris Wrench, Frederic Stahl, Giuseppe Di Fatta, Vidhyalakshmi Karthikeyanand Detlef D. Nauck (2016). *Enterprise Big Data Engineering, Analytics, and Management* (pp. 24-47).

www.irma-international.org/chapter/data-stream-mining-of-event-and-complex-event-streams/154552