NAIA – Passenger Journey Analytics

Whitepaper
From Data to Mobility Insight
INCREASE RIDERSHIP & PASSENGER EXPERIENCE

Due to the growth in urban population, there is an exponentially increasing demand for public transportation. Trains, busses, and other forms of mobility are now experiencing more crowds of people and are forced to deal with the consequences of it. With bigger masses of people comes decreased efficiency. Large floods of people accompanied with rush hour overcrowding, delays, human error, and malfunctioning machines creates a plethora of unhappy customers having to choose between waiting in long lines and finding an alternate mode of transportation.

- Ridership growth
- Passenger expectations
- More personalized experience
- Digitalization
- Network complexity
- Multimodality requirements
- Operating costs increase

In order to keep up with the demand, more rail lines are created making for a highly complicated network. Along with ridership growth, passenger expectations are increasing. Passengers now expect a more personalized experience with maximum comfort and ease. Operators are also expected to advance in technology as digitalization is growing along with the “smart city” movement. While operators are faced with all of these issues, they are also bounded by the constraints of existing aging assets and increasing operating costs.

Operators’ current efforts in understanding their passengers involve manually counting passengers at a few particular stations only a fraction of the time on particular days. This method is costly, inaccurate and does not represent more than 0.1% of the global picture, providing only a very limited understanding of the journey patterns. It misses the variability between days or stations and the different perturbations that can occur in the network.

Thanks to the exponential growth and availability of data and digital technologies (Big Data and Big Analytics technologies, Cloud…), digitalization opens new ways of working. It allows more efficient operations, structured interactions between the various services, and addresses end users expectations in a digital environment. Big data analytics for the transportation industry allows operators to learn about passengers and their everyday patterns. By creating algorithms that analyse multiple data points like ticketing data, GSM, Wi-Fi, Bluetooth, and social media posts, you can better understand the everyday flow. More importantly, you can learn from the data to be more efficient and provide a better service. Unlike traditional surveys, with big data analytics, all real trips made by commuters are taken into account to ensure completeness and fact-based outputs.

MAXIMIZE EFFICIENCY AND REDUCE OPERATING COSTS

Through near real time big data analytics, rail operators and passengers are ensured of a consistent, safe, and efficient service every day. This advanced technology enables rail operators to maximize efficiency and safety by mitigating risk and inefficiency of human error, delays, and rush hour over-capacity. Using near real time big data analytics, you learn the journey patterns of the rider while taking events that are unique to your station into account. This allows operators to serve the customer as best as possible. Serving the passengers better is a direct causation of an increase in ridership and, therefore, the generation of additional revenue by capturing more customers. Better understanding the journey patterns allow any Public Transport Agency to adapt its fare table, discount policy and transport resources. Similarly by understanding the journey patterns first and potentially adapting the routes and connection to better serve the passengers, the Public Transport Agency can consolidate or create new stream of revenues. For instance, it can be materialized through a marketing campaign along the most crowded routes. Moreover, this solution will let operators use less of the survey’s method which in return reduces costs.
ENHANCE RELIABILITY AND PERFORMANCE

NAIA is a Mobility Big Data Analytics Platform, supplied as a Service. NAIA is a cost-effective solution as operators are not required to buy any equipment as NAIA solely uses data that already exists. It aims at assessing the performance of the urban rail network by processing the data from the network (ticketing data, entries and exits) to deliver every 15 minutes the number of passenger per train, per platform and per station. We analyse the ticketing data existing in every urban transportation system. On the opposite to classical ways of computing these metrics, we don’t need any modelling work, reducing the costs, and the algorithm is time-effective, making it applicable everywhere and all the time.

Not only do we do the data processing, cleaning, and analysis, but we also make the information easily accessible and readable through a user-friendly platform. Through our platform we provide easily readable graphs, charts, and maps. For an example, we provide a heat map that is dependent on how busy the platform or station is. Our intelligent dashboards provide detailed insights of journey patterns every 15 minutes to enlighten operators with platform crowding, train occupancy, and waiting time. This advanced data platform can be easily utilized as a decision-making tool to better plan your train services, dispatch your staff, model pricing, but more importantly, it allows you to offer the best quality of service to your customers.

- Passenger flow insights and journey reconstruction
- Delivers important information easily and quickly
- Key Performance Indicators
- Accuracy rate of >95%
- Prediction of flow through near real-time analytics
- Big data analytics as a service

![Figure 1: NAIA Big Data Analytics](image)

WHY THALES?

Extensive experience in the transportation industry

Proven success through Hong Kong’s MTR

Thales truly understands your needs and challenges as we’ve been in the transportation industry for an extensive time. We’ve provided our services in a vast amount of different countries and regions so we understand that each place is unique with different strengths and weaknesses. We are fully committed to helping you provide the best service as possible as we will tailor our service to your specific needs. Thales’ big data analytics service, NAIA, has already proven to be successful through Hong Kong’s MTR, a world reference in the field of public transportation. It has over a 95% accuracy rate and has led the MTR to increase its traffic rate 5% every semester.

TESTIMONY

“Train Occupancy and Platform Crowding Analytics for MTR brings us many useful train service information, which supports us in performance monitoring and service planning for our expanding network.”

Stephen Lau, Manager – Market Analysis & Planning, MTR Corporation Limited

CONTACT

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