Predictive Demand Planning Solution (AI)

for Transport Service Provider

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Business Challenges

Client's taxi drivers were spending half their operational time on non-revenue trips primarily due to the lack of taxi demand visibility. As a result, the operational cost against revenue kept mounting, which in the long run would have limited their business development.

To address these challenges, our client aimed to implement a demand forecasting and dispatch solution for mitigating the demand-supply imbalance and routing idle drivers to passenger hotspots.

The primary requirement was to understand the dynamics of travel demand. The client wanted a solution to identify demand by employing time-series techniques on a real-world data set containing the taxi demand.

Client Profile

Our client is one of the leading taxi service providers in the Middle East who is also a frontrunner in providing customer care and comfort services of the highest standards to their clientele.

In addition, they also provide other services such as:

Transportation of Tourism, Schools & Universities

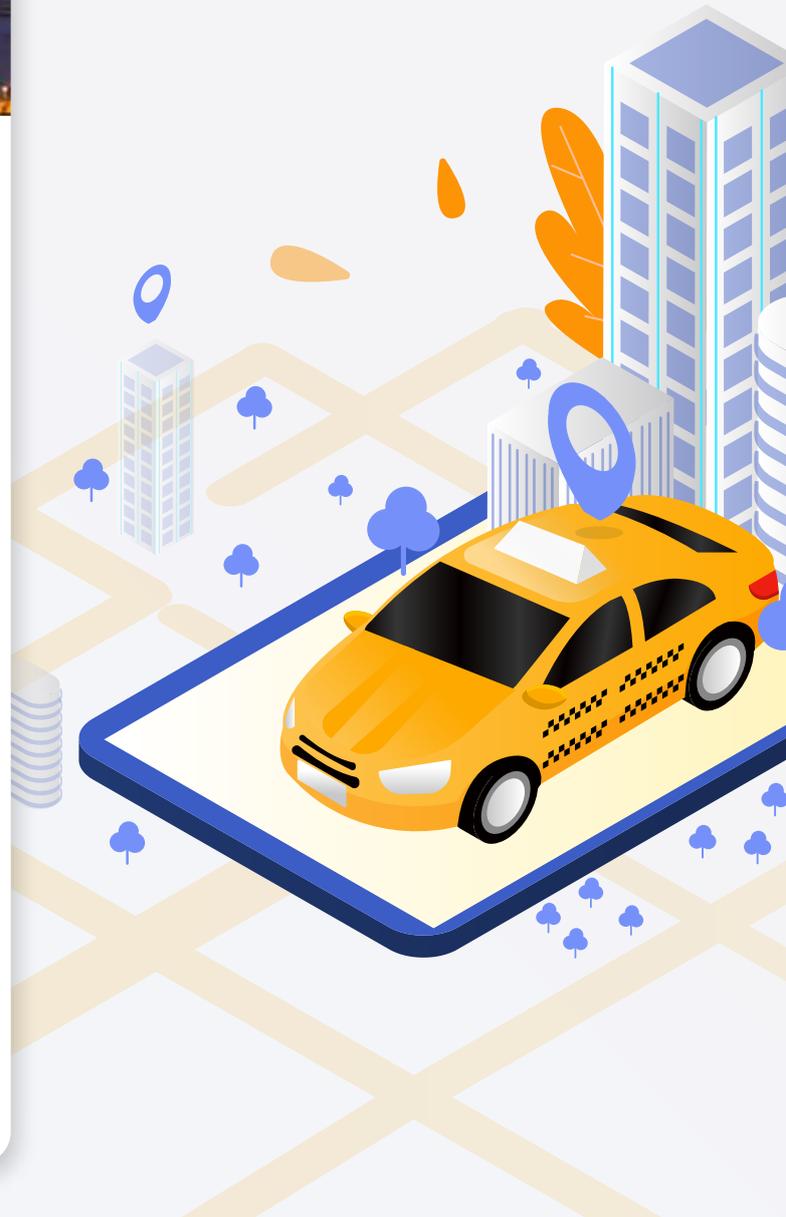**Transportation for Events & Exhibitions**

Providing Luxury Cars and Motorhomes on Rent

Cygnet's Solution

Cygnet has been delivering cutting edge travel and transport solutions based on emerging and established technologies. In this case, Cygnet's team backed by its domain expertise team collected the historical trip data from trips, live taxi locations and their statuses to identify the occupancy of different taxis from live dashboards at the control room showing current and historical data and analysis. Based on the collected data, team Cygnet analyzed the statistics of the transport demands and made the training data set to create a solution.
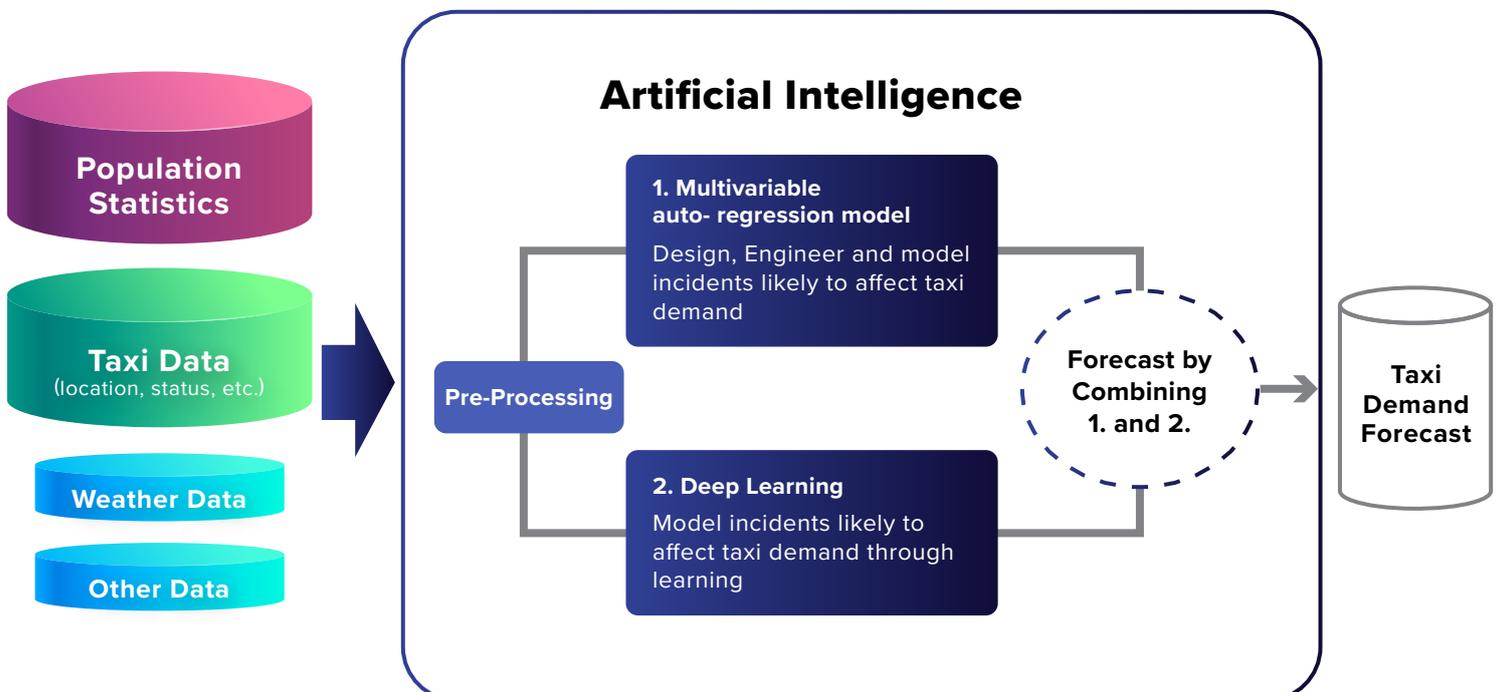
The intelligence into the solution is bolstered with Machine Learning & Deep Learning industry standard algorithms that uses historical data on a SaaS based platform and generates forecasts for taxi demands based on - location, time and events. Another aspect of the solution is tied in to forecasting demand based on population, weather, events and incident data from 3rd party data sources which could be used by a dispatch management team to tap into unfulfilled requirements. A user-friendly web solution for network controllers was developed to address this.

Furthermore, the client wanted an incentive-driven mobile application that would engage and motivate the drivers to try and be available at the high demand areas. This would enable them to attend or pick more trips. Cygnet's team developed a mobile application from where they could follow the dispatch request raised by IDS (Intelligent Dispatch System), reach the high demand area and complete the trip to earn incentives.

The app provided comprehensive earnings reports for the previous day, the previous week and present day's potential incentive earned. They were also able to see live taxi demands in nearby areas and search demands in specific areas using the search option integrated within the application itself.

Architecture Diagram

How It Works?

Collects data from data warehouses and extracts the information

Integrates with external data sources like weather data, social media, event data, airlines, etc. for accuracy of prediction

Interfaces & integrates with existing hardware and software systems

Uses machine learning & cognitive services for future demand and predictions

Provides real time dashboard view of the processed data empowering the operations team to dispatch taxis in real time

The tablet & mobile version helps drivers to reach the demand areas and earn more daily incentives

Key Features of the Solution

Area-specific demand analysis & prediction

Intelligent dispatch system

Revenue generation v/s prediction

Demand-based dispatch & tracking

Earnings statistics dashboard

Video / camera feed analysis using image processing

Navigation to high demand area

Potential earning predictions

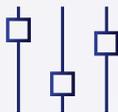Analytics reports for operation, compliance & audit

Driver & taxi management

Event creation & management

Live demand cluster on map

Search specific area using search filter

Forecasting analysis reports for trips and revenue trends

Business Benefits

- Accurate predictive analysis improves accuracy of the business model

- Vehicle demand management helps drivers to take maximum benefit

- Serves maximum number of passengers by providing timely service

- Predicted demand notification helps drivers to pick up the next trip

- Helps to make micro decisions based on the demand generation

- Reduces passenger wait time with the accurate demand forecasting

- Reduces idle time of the driver with quick updates from the locations

- Increases the number of revenue trips and decreases non-revenue trips

- Advanced analytics reports consistently assist in improved decision making

Tools, Technology and Methodology

TOOLS AND TECHNOLOGY

- PySpark
- Scikit-learn
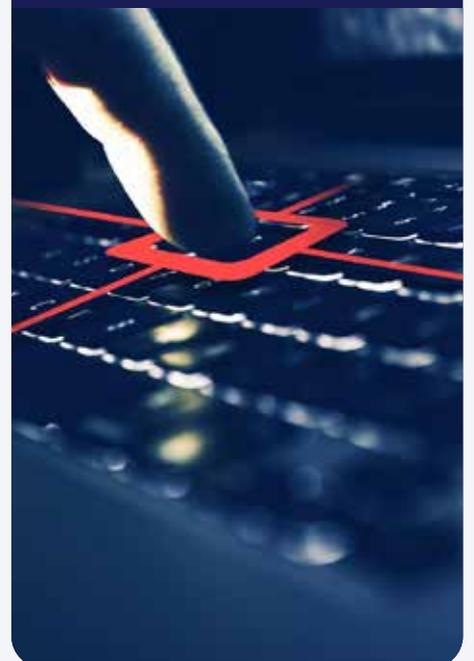- HTML5
- CSS3
- Javascript
- Bootstrap

PROGRAMMING LANGUAGE

- Python
- NodeJS
- Javascript

DATABASE ENVIRONMENT & METHODOLOGY

- MongoDB

About Cygnet

Cygnet Infotech is one of the most trusted names in the IT space delivering technology solutions to global clients across 35 countries. Born out of a vision to create software development company where quality, innovation and personalized services trump low cost, makeshift solution, Cygnet partners with its clients to help them transform in to high performance businesses.

Cygnet has deep industry and business process expertise, global resources and a proven track record in delivering innovative technology solutions. Cygnet can mobilize the right people, skills and technologies that improves business performance.

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Founded in 2000, currently with offices across 6 continents

900+ Employees Delivered 2000+ Projects

18 Years of Experience Serving 750+ clients in 35 countries

95% Client Retention

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