Airlift Technologies
Strategy Data Analyst -- Case Study

General Instructions on the Recruitment Process:

Airlift's culture is built around a few core values that define the behaviors and attitudes that we seek in teammates:

- **Hyper bias to action** -- we seek to partner with **true doers,**
- **Be an obsessive learner --** we love candidates who are **eager to learn** and grow,
- **Move at lightning speed** -- we view speed as our greatest advantage.

As you go through the recruitment process, our suggestion is to incorporate the above value system into your approach. **Airlift leans on and reads heavily into the case study -- we view the effort and thoughtfulness of the response as a proxy for what we can expect from the candidate on the team.**

Specific Instructions for the Case Study:

Question #1:

Context -- Airlift currently operates 41 express warehouses in Karachi, Lahore, Islamabad, Gujranwala, Faisalabad, Peshawar, Sialkot, Hyderabad and Johannesburg. With the incredible growth witnessed by Airlift, the company expects to add another 40 warehouses and additional cities within the next few months. As we scale, our team is struggling to ensure adequate inventory levels, price products correctly and understand how Airlift can expand or contract its future operations.

Data -- Link **--** The data contains the number of orders delivered by two dark stores daily from 10th August, 2021 till 8th November, 2021.

Problem 1 -- Explore the data and share your findings. Do you see any interesting patterns?

Problem 2 -- Store Operators at each express warehouse are responsible to pick and pack orders that land at a particular warehouse. With the current optimizations, a store operator can process 70 orders in an 8-hour shift. In order to ensure that warehouses have capacities of store ops matched to the orders for the upcoming week, we need to ensure that we can estimate the number of orders that we will deliver in the upcoming week.

- Forecast daily orders for the next week (9th November, 2021 - 15th November, 2021) for both, EW1 and EW2.
- Suggest the number of store operators we should have at each of the aforementioned

Express Warehouses.

Problem 3 -- Explain your choice of forecasting model used to solve **Problem 2.** Suggest what other metrics or features can be used to improve the demand forecasting model.

Problem 4 -- How can you measure forecasting accuracy of a forecasting model?

Question #2:

Context: One of the KPIs that delivery operations own at the market level is delivery times. However, overall delivery times are also greatly impacted by the in-warehouse order processing time that is further divided into multiple steps, delays in dispatching either due to inaccurate capacity planning or an issue with rider performance or generally longer commute times for the warehouse.

We are targeting 90%+ deliveries under 45 mins for the quarter in all the markets we are operating in. With so many points of failure in the delivery time chain, it is critical to identify what part of the problem to focus on to work towards the solution and one that will have the most impact in helping us turn the ship around.

The dataset here (click on the link to download) has the time taken on an order level for multiple warehouses on each step of the delivery chain broken down in the flowchart below for more details.

Key ask: Identify which part of the delivery chain to focus on at each warehouse to solve for the delivery times challenges on the warehouse level. Feel free to make any assumptions about the data while coming up with your solution.

Delivery Chain Breakdown:

For context the delivery time as stated above is divided into multiple steps from when the order is received to when the delivery is completed. Each part is explained below:

Order Picking queue: The time taken before an order is picked

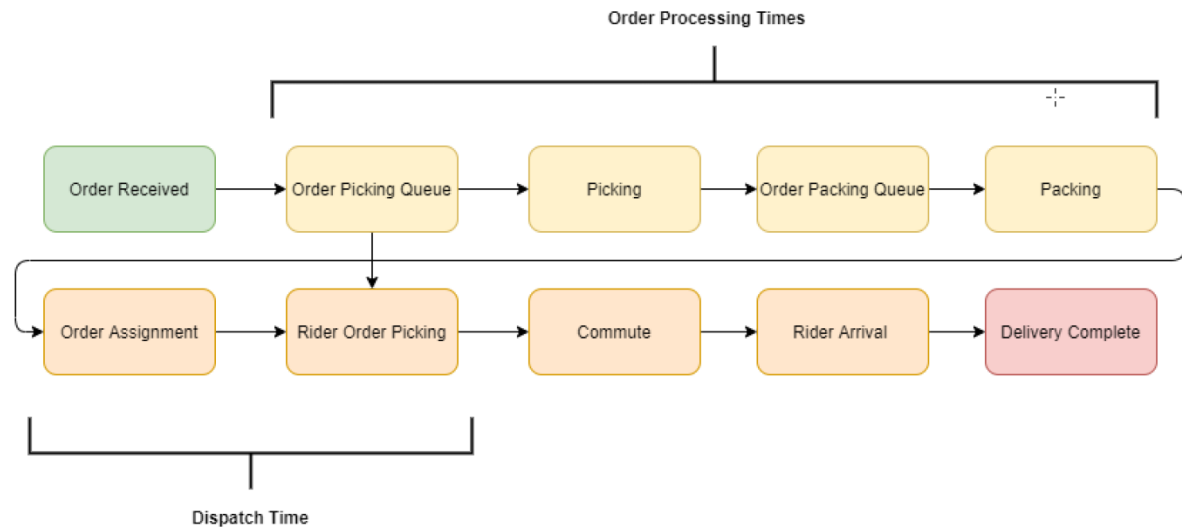Picking time: The time taken for an order to be picked in the warehouse

Order Packing queue: The time taken before an order is packed

Packing time: The time taken for an order to be packed in the warehouse

Order Assignment time: The time taken for the system to find a rider. This time is affected by the systems intrinsic efficiency and rider availability

Rider Picking time: The time taken for the rider to pick an order

Commute time: The time taken for the rider to reach the customer

Order Processing Times

Order Received → Order Picking Queue → Picking → Order Packing Queue → Packing

Order Assignment → Rider Order Picking → Commute → Rider Arrival → Delivery Complete

Dispatch Time

In answering the above questions, you can make assumptions and base your working and hypotheses on these. Please state any assumptions that you may be making. You are also free to use Excel or any other scripting language like R, Python etc to help you in your analysis.

You can submit your findings in a Document or Slides, whichever you feel best serves to communicate your findings. Please share your working files that outline the methodology you used to analyze the data.

We recommend that candidates conduct some research before authoring their solutions. Neither in this case study nor on the job would we expect you to be alone in tackling problems. We are not necessarily looking for know-it-alls; instead, we are looking for learn-it-alls, or candidates who are exceptionally talented in figuring things out. We are seeking responses that show **effort** and **thoughtfulness.**

If you have any questions, feel free to reach out to travis.taylor@airlifttech.com.