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Product Operations > Business Technology Analyst Case Study [Weekly Presentations, Python Notebook]

Guidance Timeline to Complete:

*This assignment is designed to take about **3-4 hours** to complete.*

Submission **Please submit the assignment within 5 days of receiving it.**

Don't forget to set a new submission deadline if the above mentioned is not possible in a reply to the email when you receive the assignment. Customer communication of deadlines and sticking to them is key expectation on the role.

Case Study:

Customer Profile

Changi Express Logistic (CEL) is an international freight forwarder with a monthly container volume of up to 50K containers globally via ocean, air and land. They pride themselves as one of the leading freight forwarders that deliver On-Time and In-Full delivery to their customers. More recently, CEL observed a sharp decline in carrier reliability schedules across all major trade lanes which in turn affected their operations globally. The data that the CEL operators receive from the carriers directly is often missing, is inaccurate or is only updated very late into the journey/just a day before the arrival. That does not offer enough time for the CEL teams to communicate the delay back to their own customers.

Thus, CEL's Innovations Team has sourced a handful of vendors (including Portcast) for testing on how to improve existing Ocean Supply Chain Visibility. Portcast is now 4 weeks into the POC for the predictive ETA solution. Nikana-San leads Innovations Projects and is our key stakeholder within CEL. Our weekly 1-hour check-ins are typically used to clarify on predictions being generated from our backend APIs/Emailed Reports for the cargo containers uploaded by the customer on a daily basis at a predefined schedule. E.g. 5.00am daily, each batch of approx. 200 new cargo containers (Bill of Lading No.s or Booking No.s or Container No.s are used to make a POST request on our API system)

With 80% of the container volume allocated for the trial having arrived at the POD, you are now working closely with the Account Manager to prepare for the next mid-trial review of the performance so far.

Goal of this Case Study:

The required outcome of the following exercise is to convert CELL from a Trial Account/POC-Proof of Concept to a Paid account.

Assignment:

Please complete the following:

In this task, you will create data summarization for weekly check-in with the customer after downloading the data provided. *(Below the words dataset and data dump are interchangeably used)* .**Please use a google colab notebook to make your assignment**

Getting Started:

1. Create an Ipython Notebook in Google Colab using your gmail account for FREE (**Hint:** Welcome To Colaboratory - Colaboratory?)
2. Download the JSON data-set and build a python client to read data in Google Colab. (attached in the email along with this assignment)
3. You are expected to transform this file from JSON to CSV using any python library and upload in your GDRIVE folder to make this usable for yourself both to manually explore using Google Sheets and programmatically using Ipython Notebook in Google Colab (**Hint:** you will have to colocate both the dataset and Google Colab to load the data in Google Colab)

Deliverable-1: Defining 3 key metrics to determine success of the trial

1. Based on the data provided, create 3 KPIs that we can use to evaluate the predictions provided to the customer (**Hint:**The predictions are stored in the column *portcast_predicted_pod_eta.* Every couple (container, vessel leg) has one and only actual arrival. You can give priority to *pod_ata* column and fallback to *container_pod_actual_discharge* if *pod_ata* isn't available)

Deliverable-2: Anomalies

1. Use Google Colab: Ipython Notebook to explore these by using pandas (**Hint:** https://github.com/pandas-dev/pandas) for data exploration in the above dataset. (discovery of anomalies in the dataset)

2. After identifying anomalies draw distribution graphs (**Hint:** https://github.com/plotly/plotly.py library to draw your charts) to demonstrate data challenges you have encountered
3. Export CSV in the same folder where you have Google Colab. (**Hint:**Only anomalies CSV(s) from the above Google Colab notebook)

Deliverable-3: Customer Current Performance

1. Showcasing existing visibility supply chain performance of the customer

Deliverable-4: Portcast Performance

1. Performance improvement from using Portcast predictions

Deliverable-5: Insightfulness Test

1. Define 3 most Imp Questions based on sampling the data manually/programmatically to evaluate what 3 questions your customer might ask in the next call.

Deliverable-6: Problem Solving

1. Improvement plan for the anomalies, including
    - [Internal]: communicated internally within Portcast to deliver better service levels to CELL and other customers
    - [External] communicated externally with CELL

Deliverable-7: Communication

1. Write us an email with a deliverable link Gdrive having all the above files as mentioned at the start of the assignment **with a summary email treating them as Nikana-San from Changi Express Logistic (CEL)**. Note email skills are important in how you craft your findings briefly nudging them to open your attachments. Remember customers in our industry get tons of CSVs in emails hence crafting email becomes important on a day to day basis.

Business Background

What does Portcast Do?

Portcast helps logistic players with google maps like predictions for estimated arrival time of cargo goods transported via ships, airlines, trucks and trains. ETA predictions is one of the product lines at Portcast and is the team you have applied for.

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Why is ETA prediction important ?

"Think of your anxiety to correctly predict and communicate to your friend your estimated time of arrival(ETA) when you are looking at the google maps when stuck on a red light"

Impact & Cost Savings?

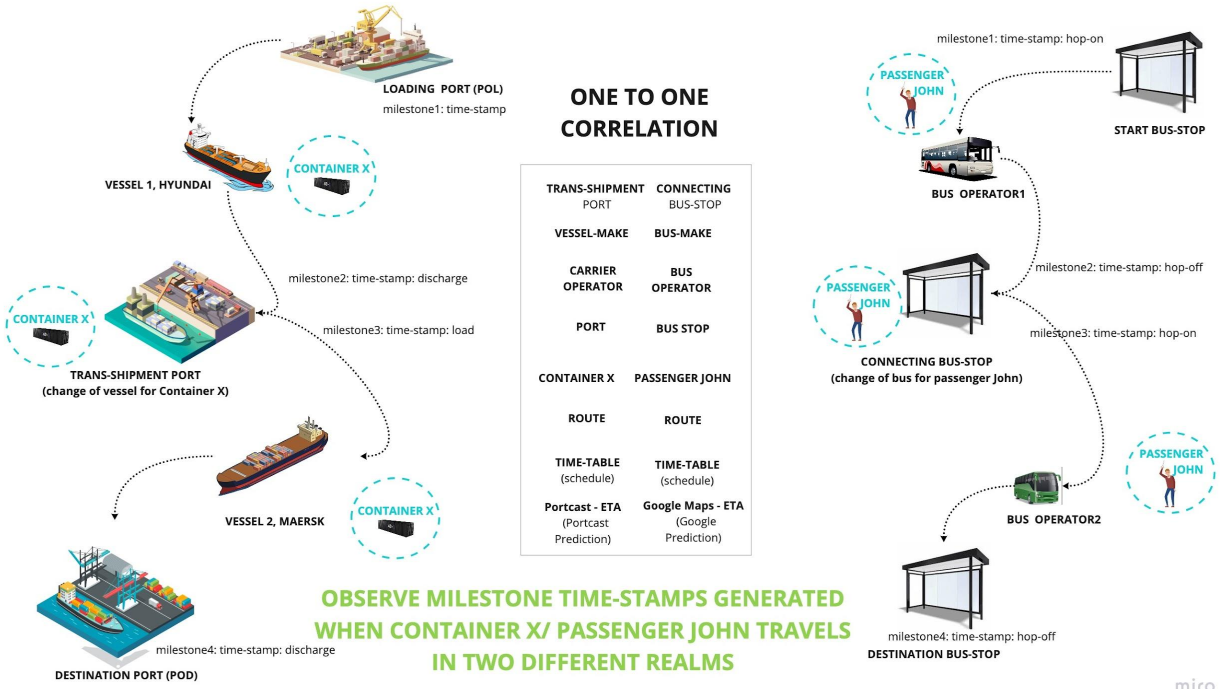
Now think of the entire world moving cargo through multi-modal transport, where every delay in one mode of transport has knock-on effects on other parts of the supply chain thereby creating billion dollar inefficiencies and lost man-hours in the system.

Why ML/AI use case?

Humanly impossible to generate rules, patterns around delay reasons(think the live impact Google Maps brings vs human patterns of old taxi drivers remembering congestion free routes). Ground reality and the always on nature of cargo movement demands a superior AI based approach to this problem at hand

Visual Analogy: Mental Model

[Download high resolution image at https://drive.google.com/file/d/1BClxQMRnNqpCY9tZidXCH6GrMDEO2F87/view]



Frontend Screenshot

[Download high resolution design image at https://drive.google.com/file/d/1Zb9v7MFoUkMJyFFIMwSGxHhIc84yZf2-/view?usp=sharing]

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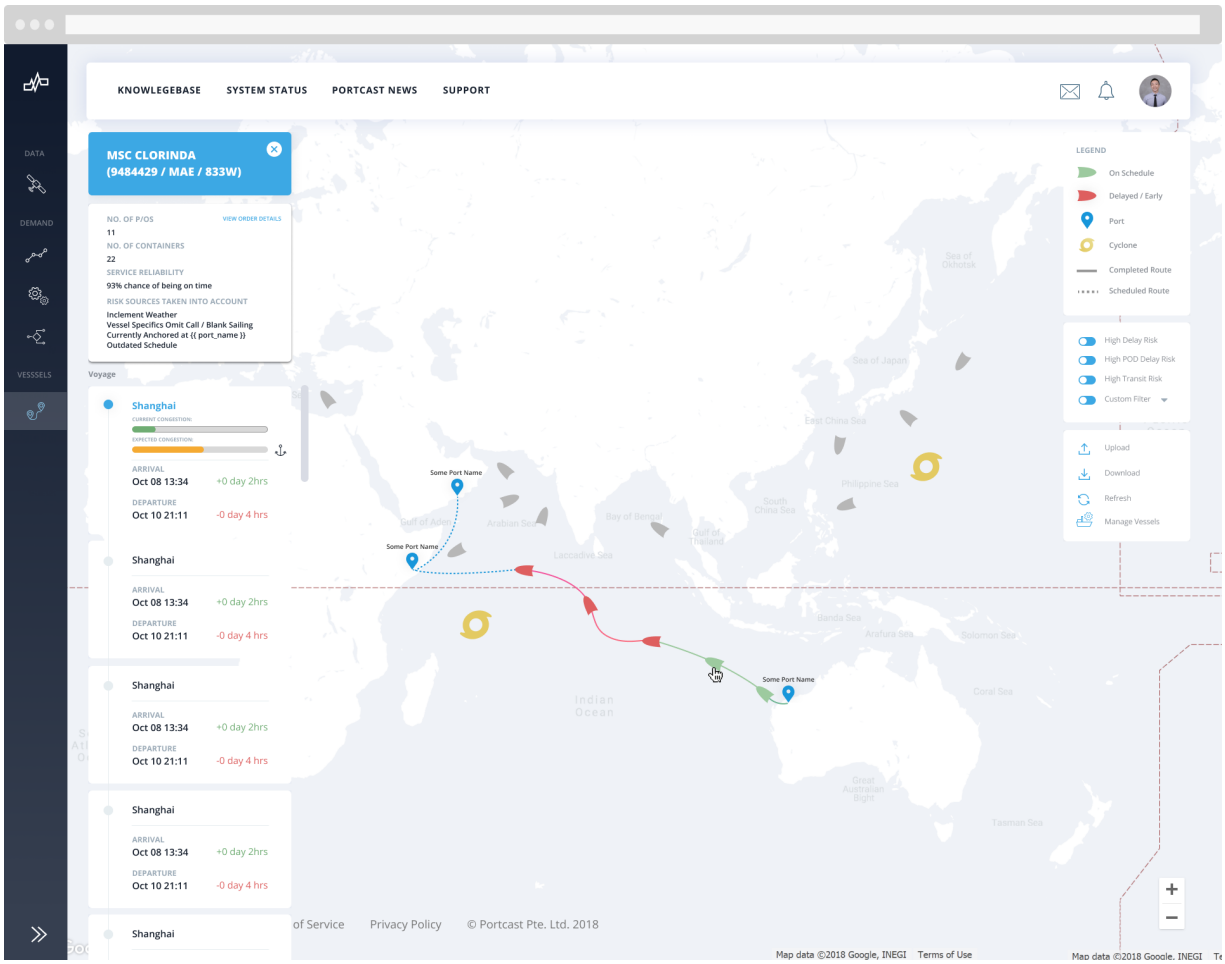
KNOWLEGEBASE
SYSTEM STATUS
PORTCAST NEWS
SUPPORT
DATA
DEMAND
VESSSELS
MSC CLORINDA
(9484429 / MAE / 833W)
NO. OF P/OS
VIEW ORDER DETAILS
11
NO. OF CONTAINERS
22
SERVICE RELIABILITY
93% chance of being on time
RISK SOURCES TAKEN INTO ACCOUNT
Inclement Weather
Vessel Specifics Omit Call / Blank Sailing
Currently Anchored at {{ port_name }}
Outdated Schedule
Voyage
Shanghai
CURRENT CONGESTION:
EXPECTED CONGESTION:
ARRIVAL
Oct 08 13:34
+0 day 2hrs
DEPARTURE
Oct 10 21:11
-0 day 4 hrs
Shanghai
ARRIVAL
Oct 08 13:34
+0 day 2hrs
DEPARTURE
Oct 10 21:11
-0 day 4 hrs
Shanghai
ARRIVAL
Oct 08 13:34
+0 day 2hrs
DEPARTURE
Oct 10 21:11
-0 day 4 hrs
Shanghai
ARRIVAL
Oct 08 13:34
+0 day 2hrs
DEPARTURE
Oct 10 21:11
-0 day 4 hrs
Shanghai
LEGEND
On Schedule
Delayed / Early
Port
Cyclone
Completed Route
Scheduled Route
High Delay Risk
High POD Delay Risk
High Transit Risk
Custom Filter
Upload
Download
Refresh
Manage Vessels
Some Port Name
Some Port Name
Some Port Name
Sea of Okhotsk
Sea of Japan
East China Sea
Philippine Sea
South China Sea
Bay of Bengal
Arabian Sea
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Arafura Sea
Solomon Sea
Coral Sea
Indian Ocean
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Tasman Sea
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