School of Computing and Information Systems

IS447: Smart Healthcare in Asia

AY 2021/2022 Semester 2

IHH x SMU Patient Experience Dashboard (Call Centre & Pharmacy Department)

Technical User Guide for (*Data Analysts*) Backend Coding

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1.0 Brief Overview

This technical user guide document entails a full step-by-step guide on replicating the analysis process for IHH. Do take the following document as reference and refer to the actual coding files as final.

For all references made in this document, do refer to the IHH Teams Folder section.

2.0 Overview of Data Files

An overview of the data files used and output files for all analyses involved in this project. Table coloured in grey are raw data received from the IHH respective departments. As for the rest, they are the output files from our coding analyses.

S/N	File Name	Remarks
1	*01. To 12. Calls Distributions.xlsx* **- 12 Individual Files**	Call Centre Dept Raw Data
2	*Call_Centre_Merged_Raw.csv*	**Output**: Call Centre Dept Raw Data Merged CSV
3	*Call_Centre_CLEANED_Final.csv*	**Output**: Call Centre Dept Cleaned w/ EDA CSV for Power BI
4	*Calls_Offered_Groupby_Week_for_Forecast.csv*	**Output**: Call Centre Dept CSV for Predictive Analysis Visual on Power BI
5	*Calls_Offered_Predicted_Values_for_2022.csv*	**Output**: Call Centre Dept CSV for Predicted Forecast Values on Power BI
6	*New_Aventa.csv*	Call Centre Dept Functional Group Raw Data
7	*Reporting_Aventa.xlsx*	
8	*Reporting_Aventa_edited.csv*	**Output**: Call Centre Dept Functional Group CSV for Analysis purposes
9	*GEH TTO Data (Jan - Dec 2021).xlsx* **- 12 Individual Files**	Pharmacy Dept (GEH Raw Data)
10	*GEH TTO TAT (April-May 2021).csv*	**Output**: Pharmacy Dept (GEH Merged Raw Data for April - May 2021) - Data fields are different from the other months
11	*GEH TTO TAT (June-Dec 2021).csv*	**Output**: Pharmacy Dept (GEH Merged Raw Data for June-Dec 2021) - Data fields are

		different from the other months
12	*GEH Wards.xlsx*	Pharmacy Dept (GEH Raw Ward Data)
13	*GEH_Data_Cleaned.csv*	**Output**: Pharmacy Dept (GEH Data Cleaned w/ EDA CSV
14	*MEH TTO Data.xlsx*	Pharmacy Dept (MEH Raw Data)
15	*MEH_TTO_Data_Merged.csv*	**Output**: Pharmacy Dept (MEH Merged Raw Data)
16	*MEH Wards.xlsx*	Pharmacy Dept (MEH Raw Ward Data)
17	*MEH_Data_Cleaned.csv*	**Output**: Pharmacy Dept (MEH Data Cleaned w/ EDA CSV
18	*MNH TTO Data.xlsx*	Pharmacy Dept (MNH Raw Data)
19	*MNH TTO Data - wo analysis table.xlsx*	Pharmacy Dept (MNH Raw Data) - **Manual remove** of all Pivot Tables and all other visualisations
20	*MNH TTO Data - MERGED.csv*	**Output**: Pharmacy Dept (MNH Merged Raw Data)
21	*MNH Wards.xlsx*	Pharmacy Dept (MNH Raw Ward Data)
22	*MNH Wards MERGED.csv*	**Output**: Pharmacy Dept (MNH Raw Ward Merged Data)
23	*MNH_Data_Cleaned.csv*	**Output**: Pharmacy Dept (MNH Data Cleaned w/ EDA CSV
24	*PEH TTO Data.xlsx*	Pharmacy Dept (PEH Raw Ward Data)
25	*PEH_TTO_Data_Merged.csv*	**Output**: Pharmacy Dept (PEH Merged Raw Data)
26	*PEH Wards.xlsx*	Pharmacy Dept (PEH Raw Ward Merged Data)
27	*PEH_Data_Cleaned.csv*	**Output**: Pharmacy Dept (PEH Data Cleaned w/ EDA CSV
28	*Merged_Pharamcy_Dept_CLEANED.csv*	**Output**: Pharmacy Dept (Final Merged of all Hospitals w/ Cleaning & EDA) for Power BI
29	*TTO_Groupby_Week_for_Forecast.csv*	**Output**: Pharmacy Dept CSV for Predictive Analysis Visual on Power BI
30	*TTO_Predicted_Values_for_2022.csv*	**Output**: Pharmacy Dept CSV for Predicted Forecast Values on Power BI

31	*Why_KPI_Not_Met.csv*	**Output**: Pharmacy Dept CSV for Diagnostic Analysis on Power BI

3.0 Overview of Coding Files

An overview of the coding files that were performed before extracting the results over to Power BI.

S/N	File Name	Remarks
1	*Call_Centre_Cleaning_EDA.ipynb*	Call Centre Dept (Basic Cleaning & EDA)
2	*Call_Centre_Forecast_Analysis_BI.ipynb*	Call Centre Dept: SARIMA Model for Power BI Forecast Visualisation
3	*Call_Centre_Predictive_Analysis.ipynb*	Call Centre Dept: Different types of models tested for Predictive Analysis on Calls Offered
4	*GEH_Cleaning.ipynb*	Pharmacy Dept (GEH Basic Cleaning & EDA)
5	*MEH_Cleaning.ipynb*	Pharmacy Dept (MEH Basic Cleaning & EDA)
6	*MNH_Cleaning.ipynb*	Pharmacy Dept (MNH Basic Cleaning & EDA)
7	*PEH_Cleaning.ipynb*	Pharmacy Dept (PEH Basic Cleaning & EDA)
8	*Merged_Pharmacy_Dept_Cleaning.ipynb*	Overall Merged Cleaning for Pharmacy Dept
9	*Pharmacy_Forecast_Analysis_BI.ipynb*	Pharmacy Dept: SARIMA Model for Power BI Forecast Visualisation
10	*Forecasting Analysis of Pharmacy Data.ipynb*	Pharmacy Dept: Different types of models tested for Predictive Analysis on No. of TTOs
11	*Pharmacy_Dept_KPI_Not_Met.ipynb*	Diagnostic Analysis for Pharmacy Dept to understand why KPI is not met
12	*Text Analysis of Pharmacy Data.ipynb*	Text Analysis for Pharmacy Dept to further understand the Remarks section (Results not shown in Power BI as results are not significant)

4.0 Data Cleaning & EDA

In this section, it details the coding files that were used specifically for data cleaning and exploratory data analysis of each respective department. Kindly do take note that the steps needed to complete the data cleaning and exploratory data analysis are indicated in each respective file.

4.1 Call Centre Department

Below is the following jupyter notebook for reference.

1. *Call_Centre_Cleaning_EDA.ipynb*

Please refer to each document for the detailed steps on the process of data cleaning.

4.2 Pharmacy Department

Below are the following five jupyter notebooks for reference.

1. *GEH_Cleaning.ipynb*
2. *MEH_Cleaning.ipynb*
3. *MNH_Cleaning.ipynb*
4. *PEH_Cleaning.ipynb*
5. *Merged_Pharmacy_Dept_Cleaning.ipynb*

Please refer to each document for the detailed steps on the process of data cleaning.

5.0 Data Analysis

In this section, it details the coding files that were used specifically for the in-depth analysis(s) for each respective department. Kindly do take note that the various in-depth analyses are sectioned in each respective file for easier understanding on how we complete and compile the results.

5.1 Call Centre Department

Below are the following two jupyter notebooks for reference on the different data analysis.

1. *Call_Centre_Forecast_Analysis_BI.ipynb*
2. *Call_Centre_Predictive_Analysis.ipynb*

Please refer to each document for the detailed steps on the in-depth analyses. It has to be noted that only the SARIMA forecasting analysis model is being visualised on the dashboard. Though we've tested out various forecasting models, the SARIMA model stands out the most based on its accuracy and the dataset we received.

5.2 Pharmacy Department

Below are the following four jupyter notebooks for reference on the different data analysis.

1. *Pharmacy_Forecast_Analysis_BI.ipynb*
2. *Forecasting Analysis of Pharmacy Data.ipynb*
3. *Pharmacy_Dept_KPI_Not_Met.ipynb*
4. *Text Analysis of Pharmacy Data*

Please refer to each document for the detailed steps on the in-depth analyses. It has to be noted that only the SARIMA forecasting analysis model is being visualised on the dashboard. Though we've tested out various forecasting models, the SARIMA model stands out the most based on its accuracy and the dataset we received. Additionally, future work is needed for the text analysis if it is being carried out in the future.