REAL–TIME TREND REPORT

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1 REAL–TIME TREND REPORT

1.1 REPORTED METRICS

The following metrics are being reported on:

- Call Stats such as Average Handle Time, Average Engage Time, Average Hold Time, Average Wrap Time
- Descriptive Stats such as Manager, Position
- Productivity Stats such as Calls per Hour, Transfers per Call, Calls Taken, Time spent with clients,

1.2 STATISTICAL INFORMATION

Generating stats such as:

- mean, std, min, (Quartile stats: 25%, 50%, 75%), max
- Agents in the negatively affecting quartile are highlighted as potential candidates for assistance or training
- Agents are binned into quartiled buckets with threshold informations and count of Agents in each bucket highlighted [Figure 1]
- There are visual cues indicating Agents that may need assistance
- The report was designed with an intention to not overwhelm the intended audience with too much information but only to identify interesting statistics that can improve the general health of the call centre.

AHT Quartiles	Number of Agents	Minimum AHT Threshold	Maximum AHT Threshold
Q1	3	299.5	333.75
Q2	3	354	397.29
Q3	2	435.23	531
Q4	3	768.44	1237.5

Figure 1: Real-Time Trend Report → Quartile Binning

1.3 DESIGN

- The report was designed with an intention to not overwhelm the intended audience with too much information but only to identify interesting statistics that can improve the general health of the call centre. The intention is to tell a story than rather than presenting a lot of numbers
- This report is built in the Jupyter Notebook environment using the Python/-Pandas/NumPy framework. This framework is used to import data from multiple sources and clean/filter/merge using the Pandas framework. After the data munging process is complete, metrics on Agents are compiled as per [Code Listing 1]
- Using the discretization and binning functions of Pandas, agents are binned

based on quartile information (see [Code Listing 3])

- **Semi-automated** → The advantage of using Python which is a general purpose language is that there are multiple libraries and frameworks that we have access to. One such library is the `xlsxwriter` framework which can be used to generate and write Excel files. This was used to generate the Presentation layer of the report which means there are no manual copy/pasting actions needs from the generating stats step to the generating UI step. This reduces a lot of the mistake that occur when manual intervention is required (see [Code Listing 4]).

```
time_spent_list.append(frame['Time Spent'].agg(np.sum))

trf_calls_list.append(frame['Transfer Initiated'].agg(np.sum))

get_wavg_engage_time = lambda g: np.average(g['Avg Engage Time'], weights=g['Accepted'])
avg_engage_time_list.append(subgroup.apply(get_wavg_engage_time).iloc[0])

get_wavg_hold_time = lambda g: np.average(g['Avg Hold Time'], weights=g['Accepted'])
avg_hold_time_list.append(subgroup.apply(get_wavg_hold_time).iloc[0])
```

Listing 1: Code Listing → Agent Metric compilation

```
thresholds_aht = algos.quantile(np.unique(df_managers['AHT'].values), np.linspace(0, 1, 5))
if np.unique(thresholds_aht).size > 1 and np.isnan(thresholds_aht).any() == False:
    insufficient_data = False
    df_stat = pd.DataFrame({'AHT Stats (Agents)': ['mean', 'std', 'min', '25%', '50%', '75%', 'max'],
                        'Values': [((df_managers['AHT'] * df_managers['Calls Taken']).sum() / df_managers['Calls Taken'].sum()),
                                   df_managers['AHT'].std(), df_managers['AHT'].min(),
                                   thresholds_aht[1], thresholds_aht[2],
                                   thresholds_aht[3], thresholds_aht[4]]})
```

Listing 2: Code Listing → Stat Generation

```
bins = pd.cut(df_managers['AHT'].values, thresholds_aht, labels=new_labels, include_lowest=True)
df_managers['AHT - Quartiles'] = bins
bins = pd.Series(bins, name='AHT Quartiles')
df_results = (pd.Series(df_managers['AHT'].values)
  .groupby(bins)
  .agg(['count', 'min', 'max'])
  .reset_index())
thresholds_tpc = algos.quantile(np.unique(df_managers['TPC'].values), np.linspace(0, 1, 5))

if np.count_nonzero(thresholds_tpc) > 0:
    bins = pd.cut(df_managers['TPC'].values, thresholds_tpc, labels=new_labels, include_lowest=True)
    df_managers['TPC - Quartiles'] = bins
else:
    df_managers['TPC - Quartiles'] = np.nan
```

Listing 3: Code Listing → Quartile Binning

```
if insufficient_data == False and np.unique(thresholds_calls_taken).size > 1:
ws.conditional_format(cond_range, {'type': 'cell',
                                   'criteria': 'between',
                                   'minimum': thresholds_calls_taken[0] if insufficient_data == False else -1,
                                   'maximum': thresholds_calls_taken[1] if insufficient_data == False else -1,
                                   'format': format_red})

#set_trace()
cond_start_row = cond_start_row - 1
cond_range = 'B'+str(cond_start_row)+':'+'T'+str(cond_end_row)
if insufficient_data == False:
    ws.add_table(cond_range, {'header_row': 1, 'name': table_name, 'style': 'Table Style Light 8',
                         'columns': [{'header': 'Agent'},
                                     {'header': 'AHT'},
                                     {'header': 'Avg Engage Time'},
                                     {'header': 'Avg Hold Time'},
                                     {'header': 'Avg Wrap Time'},
                                     {'header': 'Manager'},
                                     {'header': 'Position'},
                                     {'header': 'CPH'},
                                     {'header': 'AP - Hours'},
                                     {'header': 'TPC'},
                                     {'header': 'Calls Taken'},
                                     {'header': 'AHT - Quartiles'},
                                     {'header': 'Avg Engage Time - Quartiles'},
                                     {'header': 'Avg Hold Time - Quartiles'},
                                     {'header': 'Avg Wrap Time - Quartiles'},
                                     {'header': 'CPH - Quartiles'},
                                     {'header': 'AP - Hours - Quartiles'},
                                     {'header': 'TPC - Quartiles'},
                                     {'header': 'Calls Taken - Quartiles'}]})
```

Listing 4: Code Listing → Excel UI Generation