**ABC Call Volume Trend Analysis**

**(Final Project-4)**

**Project Description:**

The attached dataset is of Inbound calls of an ABC company from the insurance category consists of

a Customer Experience (CX) Inbound calling team for 23 days. Data includes Agent Name,

Agent\_ID, Queue\_Time [duration for which customer have to wait before they get connected to an

agent], Time [time at which call was made by customer in a day], Time\_Bucket [for easiness we

have also provided you with the time bucket], Duration [duration for which a customer and

executives are on call, Call\_Seconds [for simplicity we have also converted those time into

seconds], call status (Abandon, answered, transferred).

A customer experience (CX) team consists of professionals who analyze customer feedback and

data, and share insights with the rest of the organization. Typically, these teams fulfil various roles

and responsibilities such as: Customer experience programs (CX programs), Digital customer

experience, Design and processes, Internal communications, Voice of the customer (VoC), User

experiences, Customer experience management, Journey mapping, Nurturing customer,

interactions, Customer success, Customer support, Handling customer data, Learning about the

customer journey.

Interactive Voice Response (IVR), Robotic Process Automation (RPA), Predictive Analytics, Intelligent

Routing is some of the most impactful AI-empowered customer experience tools we can use in this

project.

**Approach:**

* Analyze the dataset in Microsoft Excel
* Understanding each column
* Checking format, missing values and duplicate values
* Using pivot table and charts to solve the given problems
* Creating final report in Microsoft Word

**Tech-****Stack Used:**

* **Microsoft Excel :** It enables users to format, organize and calculate data in a spreadsheet. It organizes data in an easy-to-navigate way. We need not to perform any complex mathematical functions. And it turns piles of data into helpful graphics and charts.

**Insights:**

**Q.1 Calculate the average call time duration for all incoming calls received by agents (in each Time\_Bucket).**

* **Time\_Bucket is measured in the Rows and average of Call\_Seconds is measured in the**

**Values section. And we put Call\_Status in the Filters section.**

* **The total average of call time duration which are answered by the agents is 198.6 seconds.**
* **The average call time duration for all incoming calls received by agents is the highest in**

**between 10 am to 11 am and from 7 pm to 8 pm.**

* **The average call time duration for all incoming calls received by agents is the least in**

**between 12 noon to 1 pm.**

**Q.2 Show the total volume/ number of calls coming in via charts/ graphs [Number of calls v/s Time]. You can select time in a bucket form (i.e., 1-2, 2-3, ….)**

* **We plotted Time\_Bucket in the rows and took Count of Customer\_Phone\_No and Count of Time in the Values section.**
* **We measured Count of Time as the percentage of Column Total.**
* **The customers call the most in between 11 am to 12 noon, total 14626 calls are handled.**
* **The customers call the least in between 8 pm to 9 pm, total 5505 calls.**
* **Assumption:** An agent work for 6 days a week; On an average total unplanned leaves per agent is 4 days a month; An agent total working hrs is 9 Hrs out of which 1.5 Hrs goes into lunch and snacks in the office. On average an agent occupied for 60% of his total actual working Hrs (i.e. 60% of 7.5 Hrs) on call with customers/ users. Total days in a month is 30 days.

|  |  |
| --- | --- |
| Agents working hour | 9 |
| Agents on-floor work hour | 7.5 |
| Working Days | 6 |
| Out of 30 days, an agent works | 26 |
| Unplanned leave days | 4 |
| Work days per month | 22 |
| Days an agent work in a week | 5 |
| Actual working hours | 60% |
| Total time spent on call | 4.5 |

**Q.3 As we can see current abandon rate is approximately 30%. Propose a manpower plan required during each time bucket [between 9am to 9pm] to reduce the abandon rate to 10%. (i.e., We have to calculate minimum number of agents required in each time bucket so that at least 90 calls should be answered out of 100.)**

**Manpower plan required during each time bucket (between 9am to 9pm) to reduce the abandon rate to 10%**

|  |  |  |  |
| --- | --- | --- | --- |
| **Executive** | **abandon** | **answered** | **transfer** |
| #N/A | 34198 |  |  |
| **Grand Total** | **34403** | **82452** | **1133** |

**It can be seen that out of 34403 calls dropped, 34198 calls have not been answered by anyone. This can also mean that the agents were busy in any other calls and so, they were unable to tend to these calls.**

**This means that we need to increase the man power to reduce the drop rate.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time\_Bucket** | **Number of Agents** | **Abandon Rate** | **Calls Each Day** | **Avg Call Duration** | **AVERAGE of Queue\_Time(Secs)** |
| **09\_10** | 42 | 53.70% | 416.87 | 92.01 | 82.86 |
| 10\_11 | 51 | 51.91% | 578.83 | 97.42 | 83.25 |
| 11\_12 | 59 | 41.21% | 635.91 | 116.78 | 72.32 |
| 12\_13 | 60 | 24.29% | 550.09 | 144.73 | 41.66 |
| 13\_14 | 58 | 22.64% | 502.65 | 149.54 | 41.8 |
| 14\_15 | 60 | 23.44% | 459.17 | 146.97 | 43.6 |
| 15\_16 | 58 | 13.25% | 398.22 | 169.9 | 29.88 |
| 16\_17 | 58 | 8.50% | 382.09 | 181.44 | 23.54 |
| 17\_18 | 58 | 9.18% | 371.04 | 179.72 | 23.75 |
| 18\_19 | 59 | 12.89% | 314.7 | 174.32 | 34.09 |
| 19\_20 | 52 | 28.59% | 281 | 144.58 | 58.69 |
| 20\_21 | 27 | 47.68% | 239.35 | 105.95 | 75.28 |
| Grand Total | **66** | **29.16%** | **5129.91** | **139.53** | **52.17** |

It can be inferred that the abandon rates are high on particular times of a day and lowest on a particular time in a day. Even though the calls are low during the 9\_10 bucket, the drop rate is very high.

We have the average call duration in each time bucket. Using that, we can calculate approximately how much time the call centre agents are spending talking to the customers in total in a particular time bucket. By using that data, we can arrive at the approximate number of agents required to have a drop rate lesser than 10 %.

It can also be seen that the time buckets in which the avg call duration is high and avg queue time is low have lesser drop rates.

Note: A tolerance level needs to be added in every calculation to account for the errors.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time\_Bucket** | **9 Shift** | **10 Shift** | **12 Shift** | **Agents Req** | **Agents Req Calculated** |
| **09\_10** | 50 | 0 | 0 | 50 | 44.88 |
| 10\_11 | 50 | 20 | 0 | 70 | 64.04 |
| 11\_12 | 50 | 20 | 0 | 70 | 73.96 |
| 12\_13 | 25 | 10 | 40 | 75 | 62.65 |
| 13\_14 | 0 | 20 | 40 | 60 | 58.47 |
| 14\_15 | 50 | 0 | 20 | 70 | 53.57 |
| 15\_16 | 25 | 20 | 40 | 85 | 48.84 |
| 16\_17 | 50 | 20 | 0 | 70 | 47.60 |
| 17\_18 | 50 | 10 | 20 | 80 | 46.01 |
| 18\_19 | 0 | 20 | 30 | 50 | 39.48 |
| 19\_20 | 0 | 0 | 40 | 40 | 34.78 |
| 20\_21 | 0 | 0 | 30 | 30 | 26.58 |

Agents Required is calculated by using the formula

Agents Req Calculated = 1.1 \* calls Each Day \* 2 \* (avg call duration + avg queue time)

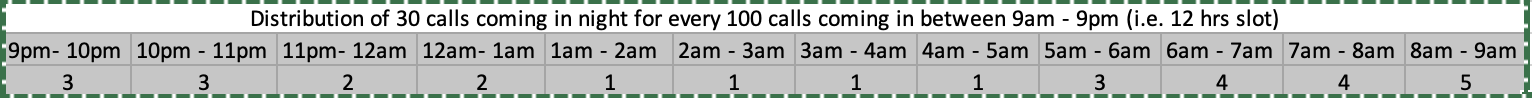
where 1.1 and 2 are tolerance of no of calls and waiting time respectively.

So, the total man power required = 9 AM shift + 10 AM Shift + 12 PM Shift = 50 + 20 + 40 = 110

New Manpower to be added = req man power - available employees = 110 – 66 **= 44**

* **It is advised to add 44 new employees to reduce the abandon rate from 30 % to 10 %.**
* **The highest number of agents required is 8 between 11am to 12pm.**
* **The agent requirement is corresponding to call volume.**
* **As call volume decreases the agent requirement also decrease.**
* **The number of agents required starts decreasing in late afternoon and evening.**

**Q.4 Let’s say customers also call this ABC insurance company in night but didn’t get answer as there are no agents to answer, this creates a bad customer experience for this Insurance company. Suppose every 100 calls that customer made during 9 Am to 9 Pm, customer also made 30 calls in night between interval [9 Pm to 9 Am] and distribution of those 30 calls are as follows:**



**Now propose a manpower plan required during each time bucket in a day. Maximum Abandon rate assumption would be same 10%.**

* Men required can be calculated from the same formula given in the previous slide. For the night calls too, men required can be found from the same formula. Calls/ day can be found from the data for the whole 24 hours. A shift plan has been drafted in which the required number of agents in that specific period of time has been used to carefully decided based on the expected number of calls along with some tolerance**.**

**8 AM Shift**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Time Bucket | Men Required | Total Men | 8 AM Shift | 5 PM Shift | 2 AM Shift |
| 08\_09 | **42.93** | **80** | **60** | **0** | **20** |
| 09\_10 | **44.88** | **90** | **70** | **0** | **20** |
| 10\_11 | **64.04** | **70** | **70** | **0** | **0** |
| 11\_12 | **73.96** | **70** | **70** | **0** | **0** |
| 12\_13 | **62.65** | **60** | **60** | **0** | **0** |
| 13\_14 | **58.47** | **60** | **60** | **0** | **0** |
| 14\_15 | **53.57** | **60** | **60** | **0** | **0** |
| 15\_16 | **48.84** | **50** | **50** | **0** | **0** |
| 16\_17 | **47.60** | **50** | **50** | **0** | **0** |

**5 PM Shift**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time Bucket** | **Men Required** | **Total Men** | **8 AM Shift** | **5 PM Shift** | **2 AM Shift** |
| **17\_18** | **46.14** | **50** | **0** | **50** | **0** |
| 18\_19 | **40.08** | **50** | **0** | **50** | **0** |
| 19\_20 | **34.91** | **50** | **0** | **50** | **0** |
| 20\_21 | **26.51** | **50** | **0** | **50** | **0** |
| 21\_22 | **25.76** | **25** | **0** | **25** | **0** |
| 22\_23 | **25.76** | **25** | **0** | **25** | **0** |
| 22-00 | **17.17** | **50** | **0** | **50** | **0** |
| 00\_01 | **46.14** | **50** | **0** | **50** | **0** |
| 01\_02 | **40.08** | **70** | **0** | **50** | **20** |

**2 AM Shift**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time Bucket** | **Men Required** | **Total Men** | **8 AM Shift** | **5 PM Shift** | **2 AM Shift** |
| **02\_03** | **8.59** | **20** | **0** | **0** | **20** |
| 03\_04 | **8.59** | **10** | **0** | **0** | **10** |
| 04\_05 | **8.59** | **10** | **0** | **0** | **10** |
| 05\_06 | **25.76** | **20** | **0** | **0** | **20** |
| 06\_07 | **34.34** | **20** | **0** | **0** | **20** |
| 07\_08 | **34.34** | **20** | **0** | **0** | **20** |
| 08\_09 | **42.93** | **80** | **60** | **0** | **20** |

**So, the total number of man power needed is 8 AM shift + 5 PM Shift + 2 AM Shift = 70 + 50 +20 = 140.**

**After hiring 140 - 66 = 74 agents, we can expect the call abandon rates to lesser than 10 %.**

**Result:**

**• In this project I have learned how to perform trend analysis on call volume data**

**• Identified key metrics such as call handling time, call volume and agent requirement**

**• Propose man power plan to achieve 90% answer rate**

**• Created charts on call volume and average call duration using pivot table**

**• I have learned how to analyze costumer experience data and this project also help me to improve visualization.**