Tutorial 1.2: Building a simple dashboard

Friday, 07 October 2022 22:45

A call centre data is given

Given is time stamp (on hourly basis) and call volumes (number of incoming calls received in that time slot)
(T1)

Time stamp	Call Volume
A	

Objectives

- Show daily call pattern
- Show hourly call pattern
- Get the service level
- Show a sensitivity analysis for service level

1. Daily call pattern

We will show daily pattern month wise, *i.e.*,

$$Average\ Daily\ Calls\ \ (in\ a\ month) = \frac{Total\ number\ of\ calls\ in\ that\ month}{Number\ of\ days\ in\ that\ month}$$

Number of calls made in a month

1. Extract months
(T1)

Time stamp	Call Volume	Month
A		=Month(A)

2. Create a separate list of months
(T2)

Month	Total calls made in that month	Average Daily Calls
B	C = [Sum call vol in T1 if month = B]	$\frac{C}{Number\ of\ Days\ in\ B}$

3. Plot Daily call pattern with
Average daily calls vs Month (y vs x)

2. Hourly call pattern

$$Average\ hourly\ calls = \frac{Total\ number\ of\ calls\ made\ in\ a\ given\ hour\ slot}{Total\ number\ of\ times\ that\ hour\ slot\ occured\ in\ the\ given\ data}$$

Needed variables

1. Extract hour slot in T1
(T1)

Time stamp	Call Volume	Month	Hour slot
A		=Month(A)	=Hour(A)

2. Create a separate list of hour slot (unique values)
(T3)

Hour slot	Total num of calls made in that hour slot	Total number of hour slots	Average hourly calls
D	E = [Sum call vol in T1 if hour slot = D]	F = [Count in T1 if hour slot = D]	$\frac{F}{E}$

3. Plot Average hourly calls vs Hour Slot

3. Service level

$$Service\ Level = \frac{Total\ number\ of\ attended\ calls}{Total\ number\ of\ incoming\ calls} \times 100\ (\%)$$

- **Attended Calls**

$$Total\ Attended\ calls = Total\ Incoming\ calls\ - Total\ Unattended\ calls$$

- **Unattended Calls**

$$Untattended\ Calls = Max\left((Incoming\ calls\ - Capacity),\ 0\right)$$

Reasoning:
- If Incoming < Capacity => Unattended = 0
- If Incoming > Capacity => Unattended = Incoming - Capacity

- **Capacity**

$$Capacity\ (in\ an\ hour\ slot) = Number\ of\ agents\ available\ in\ that\ hour\ slot\ \times Number\ of\ calls\ one\ agent\ can\ attend\ in\ an\ hour\ slot$$

- **Assumptions**

We're assuming that we currently have a total of 11 agents working in 3 shifts of 8 hours each shift

(T4)

	Shift	Number of agents working in this shift
(Shift starts from 8)	8	3
(Shift starts from 10)	10	4
(Shift starts from 12)	12	4

Open hours of the call centre	8 to 20
Work hours per agent	8 hours
Average call duration	5 mins
Number of calls one agent can attend in one hour	$\frac{60}{5} = 12$

- **Computing Capacity**

(T5)

Hourly Slot	Agents available from shift 8	Agents available from shift 10	Agents available from shift 12	Total number of agents available in this slot	Capacity of this hour slot
H	J = number of agents from T4 If (H>=8 and H<= 8+8) Otherwise 0	K = number of agents from T4 If (H>=10 and H<= 10+8) Otherwise 0	L = number of agents from T4 If (H>=12 and H<= 12+8) Otherwise 0	I = J+K+L	I * 12

- **Computing Service Level**

1. Extract Call Volume and Hour Slot from (T1)
(T6)

Call Volume (Incoming)	Hour Slot	Available Capacity	Unattended	Attended
	M	= Vlookup Capacity	Max(	Incoming - Unattended

		in T5 where Hour slot = M	(Incoming-Capacity), 0)	

2. Compute Service Level

Service level	$\frac{Attended}{Incoming} \times 100 \left(\%\right)$

4. Sensitivity Analysis of service level	Here, we'll change the allocation and compute service level for each allocation. That will give us the picture of how sensitive the service level is as we increase number of hired agents (and to some extent in what shift depending on what hourly slot has the maximum load).
• Computation	1. Create a list on allocations (T7)

Shift	Allocation 1 (from T4)	Allocation 2 (example)	Allocation 3 (example)
8	3	4	5
10	4	4	4
12	4	4	4

2. Now for each computation, we'll compute service level (as is demonstrated above)
(T8)

Allocation Number	Service Level
1	
2	
3	

3. Plot a bar graph: Service Level vs Allocation
