

Calculating the effect of events for the forecast

This document outlines how you can calculate the effect of events in the calendar. There are a number of steps, but it is worth persevering as the techniques are useful in many other use cases, especially the Fake Time to Real Time mapping.

I have assumed we are in 2019 and our forecast is needed for 2020.

Time

Model Calendar Time Ranges

Calendar Type Calendar Months/Quarters/Years

Fiscal Year Start Month Jan

Current Fiscal Year FY19: 1 Jan 2019 - 31 Dec 2019

Number of Past Years 0

Number of Future Years 1

Current Period Jul 19

Include ☐ Quarter Totals
☐ Half-Year Totals
☐ Year To Date Summary

1. Set up a Days of Week list, with the codes matching the day of the week as below. This is needed later to map to the dates.

Days of Week

Tree View **Grid View** Properties Subsets Configure

View Import... Export... Insert... Delete... Move... Refresh Q

	Parent	Code
Monday	▼	1
Tuesday		2
Wednesday		3
Thursday		4
Friday		5
Saturday		6
Sunday		7

2. Create a Fake Days list. This list needs to cover the history (so in our case 2019). You could add these manually, but I will show you how you can do this using the existing time settings. This makes it easier to update for the next year.

3. Set up a Time by Day Module

You need this to map the days to the Days of the week as well as the mapping between fake time and real time. We will also use this module to create the Fake Days list. The module is dimensioned by day.

Time By Day

	1 Jan 19	2 Jan 19	3 Jan 19	4 Jan 19	5 Jan 19	6 Jan 19	7 Jan 19	8 Jan 19
Date	01/01/2019	02/01/2019	03/01/2019	04/01/2019	05/01/2019	06/01/2019	07/01/2019	08/01/2019
Year	FY19	FY19	FY19	FY19	FY19	FY19	FY19	FY19
Current Year	FY19	FY19	FY19	FY19	FY19	FY19	FY19	FY19
Days only?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DOW	2	3	4	5	6	7	1	2
Day of Week List	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday
Fake Days List	1 Jan 19	2 Jan 19	3 Jan 19	4 Jan 19	5 Jan 19	6 Jan 19	7 Jan 19	8 Jan 19
-- Fake Days Creation --								
Fake Days Text	1 Jan 19	2 Jan 19	3 Jan 19	4 Jan 19	5 Jan 19	6 Jan 19	7 Jan 19	8 Jan 19
History?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
View Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Time By Day	Formula	Apply	Format	Applies To	Time Scale	Time Range	Versions	Start of Section	Brought-Forward	Summary
Date	START()		Date	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
Year	PERIOD(Date)		Year	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	Last non-blank
Current Year	PERIOD(CURRENTPERIODSTART())		Year	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
Days only?	TRUE		Boolean	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
DOW	WEEKDAY(START())		Number	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	Sum
Day of Week List	FINDITEM(Days of Week, TEXT(DOW))		Days of Week	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
Fake Days List	FINDITEM(Fake Days, Fake Days Text)		Fake Days	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
-- Fake Days Creation --										
Fake Days Text	NAME(ITEM(Time))		No Date	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
History?	Year = Current Year		Text	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None
View Filter	Days only? AND History?		Boolean	-	Day	Model Calendar Not Applicable		<input type="checkbox"/>	<input type="checkbox"/>	None

At this point, the values for Fake Days list will be blank because we haven't yet populated the list. We set this line item up for future functionality. We don't actually need it for this use case, but it is best practice when mapping from time to fake time and back, to set up both mappings at the time of creation, just in case.

4. Set up a view to use as the import action into the Fake Days list.

Create Fake Days

	Fake Days Text	Date
1 Jan 19	1 Jan 19	01/01/2019
2 Jan 19	2 Jan 19	02/01/2019
3 Jan 19	3 Jan 19	03/01/2019
4 Jan 19	4 Jan 19	04/01/2019
5 Jan 19	5 Jan 19	05/01/2019
6 Jan 19	6 Jan 19	06/01/2019
7 Jan 19	7 Jan 19	07/01/2019
8 Jan 19	8 Jan 19	08/01/2019
9 Jan 19	9 Jan 19	09/01/2019
10 Jan 19	10 Jan 19	10/01/2019
11 Jan 19	11 Jan 19	11/01/2019
12 Jan 19	12 Jan 19	12/01/2019
13 Jan 19	13 Jan 19	13/01/2019
14 Jan 19	14 Jan 19	14/01/2019
15 Jan 19	15 Jan 19	15/01/2019

The view is filtered using the View Filter line item, filtering on the current year and removing any subtotals (we don't need these for calculations).

Filter

Time

Line Items

Show items that match

all

 of the following

Time By Day: View Filter

is equal to

☒

5. Save this view as Create Fake Days
6. Open the Fake Days list and create an import action using view from 5.
- Import: Fake Days from Community Posts / Time By Day.Create Fake Day**

Mapping

Source	Property in List
Column 2: Fake Days Text	→ Fake Days
	→ Parent
Column 2: Fake Days Text	→ Code

Note that I use the same format as displayed in the Time module for Name and Code. This makes it a lot easier to map using FINDITEM – No need for loads of text manipulation.

7. Import the data and you should have a Fake Days list spanning 2019.

Fake Days

Tree View

Grid View

Properties

Subsets

Configure

View

Import...

Export...

+ Insert...

- Delete...

↕ Move...

🔄 Refresh

	Parent	Code
1 Jan 19	<div></div>	1 Jan 19
2 Jan 19		2 Jan 19
3 Jan 19		3 Jan 19
4 Jan 19		4 Jan 19
5 Jan 19		5 Jan 19
6 Jan 19		6 Jan 19
7 Jan 19		7 Jan 19
8 Jan 19		8 Jan 19
9 Jan 19		9 Jan 19
10 Jan 19		10 Jan 19
11 Jan 19		11 Jan 19
12 Jan 19		12 Jan 19
13 Jan 19		13 Jan 19

8. We now set up a Day of Week offset module to hold the range of days either side of the “event”. In this example I have used 2 days either side. From experience it is best not to go too far either way otherwise you start to get overlaps. This module is not dimensioned by anything.

DOW Offsets

Days before	Days after
2	2

9. Now we will create a module Holidays? Module to track when the event took place.

Holidays?

	Day of Week	Holiday?	Affected Days?
1 Jan 19	Tuesday	<input type="checkbox"/>	<input type="checkbox"/>
2 Jan 19	Wednesday	<input type="checkbox"/>	<input type="checkbox"/>
3 Jan 19	Thursday	<input type="checkbox"/>	<input type="checkbox"/>
4 Jan 19	Friday	<input type="checkbox"/>	<input type="checkbox"/>
5 Jan 19	Saturday	<input type="checkbox"/>	<input type="checkbox"/>
6 Jan 19	Sunday	<input type="checkbox"/>	<input type="checkbox"/>
7 Jan 19	Monday	<input type="checkbox"/>	<input type="checkbox"/>
8 Jan 19	Tuesday	<input type="checkbox"/>	<input type="checkbox"/>
9 Jan 19	Wednesday	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10 Jan 19	Thursday	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11 Jan 19	Friday	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12 Jan 19	Saturday	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Jan 19	Sunday	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14 Jan 19	Monday	<input type="checkbox"/>	<input type="checkbox"/>
15 Jan 19	Tuesday	<input type="checkbox"/>	<input type="checkbox"/>
16 Jan 19	Wednesday	<input type="checkbox"/>	<input type="checkbox"/>
17 Jan 19	Thursday	<input type="checkbox"/>	<input type="checkbox"/>
18 Jan 19	Friday	<input type="checkbox"/>	<input type="checkbox"/>
19 Jan 19	Saturday	<input type="checkbox"/>	<input type="checkbox"/>
20 Jan 19	Sunday	<input type="checkbox"/>	<input type="checkbox"/>
21 Jan 19	Monday	<input type="checkbox"/>	<input type="checkbox"/>
22 Jan 19	Tuesday	<input type="checkbox"/>	<input type="checkbox"/>

Let's focus on Friday 11th January. You see we flag the two days either side as affected days.

Affected Days?		Formula		Parent	Is Summary	Format	Id	St
Holidays?		MOVINGSUM(Holiday?, 1, DOW Offsets.Days before, ANY) OR MOVINGSUM(Holiday?, -DOW Offsets.Days after, -1, ANY) AND NOT Holiday?						
Day of Week		Time By Day.Day of Week List				Days of Week		None
Holiday?						Boolean		None
Affected Days?		MOVINGSUM(Holiday?, 1, DOW Offsets.Days before, ANY) OR MOVINGSUM(H				Boolean		None

Note: Affected Days? Using the DOW offsets from 8 and the ANY aggregation method for moving sum. No need to convert the Boolean flag to a number and back

10. We now create a module dimensioned by Fake Days to map the Fake Days to real days and the statuses of the Holidays and affected days. We need to map the timescales based on the dates, so we can import the dates from the view we created in 4.

Import: Fake Days Settings from Community i

Mapping Fake Days Fake Days Settings Line Items

Source Target

Column 1: Time Fake Days (1 Jan 19, 2 Jan 19, 3 Jan 19, 4 Jan 19, 5 Jan 19, 6 Jan 19, 7 Jan 19, 8 Jan 19, 9 Jan 19, 10 Jan 19, 11 Jan 19)

Fixed line item Fake Days Settings Line Items

Clear target prior to import

Only update imported cells

Data values from Column 3: Date

Time	Fake Days Text	Date
1 Jan 19	1 Jan 19	2019-01-01
2 Jan 19	2 Jan 19	2019-01-02
3 Jan 19	3 Jan 19	2019-01-03
4 Jan 19	4 Jan 19	2019-01-04
5 Jan 19	5 Jan 19	2019-01-05
6 Jan 19	6 Jan 19	2019-01-06
7 Jan 19	7 Jan 19	2019-01-07
8 Jan 19	8 Jan 19	2019-01-08
9 Jan 19	9 Jan 19	2019-01-09
10 Jan 19	10 Jan 19	2019-01-10
11 Jan 19	11 Jan 19	2019-01-11

Import: Fake Days Settings from Community Posts / Time By Day.Create

Mapping Fake Days Fake Days Settings Line Items

Marked as (Fixed Target Item) in the Mapping tab; please specify a value Date

The module should look like this

Fake Days Settings

	1 Jan 19	2 Jan 19	3 Jan 19	4 Jan 19	5 Jan 19	6 Jan 19	7 Jan 19	8 Jan 19	9 Jan 19	10 Jan 19	11 Jan 19	12 Jan 19	13 Jan 19	14 Jan 19	15 Jan 19
Date	01/01/2019	02/01/2019	03/01/2019	04/01/2019	05/01/2019	06/01/2019	07/01/2019	08/01/2019	09/01/2019	10/01/2019	11/01/2019	12/01/2019	13/01/2019	14/01/2019	15/01/2019
Day of Week	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday
Holiday?															
Affected Day?															
Base Data Count	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1
Holiday Count	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Affected Count	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0

Holiday? Holidays?.Holiday?[LOOKUP: Date]

	Formula	Parent	Is Summary	Format	Unit
Fake Days Settings					
Date				Date	None
Day of Week	Time By Day.Day of Week List[LOOKUP: Date]			Days of Week	None
Holiday?	Holidays?.Holiday?[LOOKUP: Date]			Boolean	None
Affected Day?	Holidays?.Affected Days?[LOOKUP: Date]			Boolean	None
Base Data Count	IF NOT Holiday? AND NOT Affected Day? THEN 1 ELSE 0			Number	None
Holiday Count	IF Holiday? THEN 1 ELSE 0			Number	None
Affected Count	IF Affected Day? THEN 1 ELSE 0			Number	None

Note we've mapped in the flags from the Holidays? Module from real time to Fake time by using a LOOKUP on the real date. We need the counts to work out the average effect later

11. Let's assume we have the historic data in a model. In this case we are using a Time Range for efficiency, so this module only covers FY19

Products by Day Historic																			Data
	1 Jan 19	2 Jan 19	3 Jan 19	4 Jan 19	5 Jan 19	6 Jan 19	7 Jan 19	8 Jan 19	9 Jan 19	10 Jan 19	11 Jan 19	12 Jan 19	13 Jan 19	14 Jan 19	15 Jan 19	16 Jan 19	17 Jan 19	18 Jan 19	
Product 1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 2	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 3	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 4	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 5	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 6	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 7	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 8	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 9	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
Product 10	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	
All Products	20	30	40	50	60	70	10	20	30	40	50	60	70	10	20	30	40	50	

12. We now create the equivalent module using Fake Days

Data Products by Day Historic.Data[LOOKUP: Fake Days Settings.Date]														
Products by Fake Day Historic Data														
	1 Jan 19	2 Jan 19	3 Jan 19	4 Jan 19	5 Jan 19	6 Jan 19	7 Jan 19	8 Jan 19	9 Jan 19	10 Jan 19	11 Jan 19	12 Jan 19	13 Jan 19	1
Product 1	2	3	4	5	6	7	1	2	2	3	10	5	6	
Product 2	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 3	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 4	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 5	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 6	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 7	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 8	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 9	2	3	4	5	6	7	1	2	3	4	5	6	7	
Product 10	2	3	4	5	6	7	1	2	3	4	5	6	7	

	Formula	Parent	Is Summary	Format	Applies To	Time Sc
Products by Fake Day Historic					Fake Days, P2 Products	Not Applic
Data	Products by Day Historic.Data[LOOKUP: Fake Days Settings.Date]		<input type="checkbox"/>	Number	-	Not Applic
Base Data	IF NOT Fake Days Settings.Holiday? THEN Data ELSE 0		<input type="checkbox"/>	Number	-	Not Applic
Holiday?	IF Fake Days Settings.Holiday? THEN Data ELSE 0		<input type="checkbox"/>	Number	-	Not Applic
Affected Days?	IF Fake Days Settings.Affected Day? THEN Data ELSE 0		<input type="checkbox"/>	Number	-	Not Applic

Let's focus on our event and the affected days either side

Products by Day Historic Data					
	9 Jan 19	10 Jan 19	11 Jan 19	12 Jan 19	13 Jan 19
Product 1	2	3	10	5	6
Product 2	3	4	5	6	7

Products by Fake Day Historic Product 1					
	9 Jan 19	10 Jan 19	11 Jan 19	12 Jan 19	13 Jan 19
Data	2	3	10	5	6
Base Data	2	3	0	5	6
Holiday?	0	0	10	0	0
Affected Days?	2	3	0	5	6

It's simple logic to allocate the data to the respective line item. We exclude the holiday from the Base Data

13. We now can calculate the effect for each Day of the Week

Products Data by DOW Product 1							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Average Data (excl Holidays)	1	2	3.039	4.059	5	6.098	7.118
Average Holiday	0	0	0	0	10	0	0
Average Affected	0	0	2	3	0	5	6
Holiday Impact - day itself	0.00%	0.00%	0.00%	0.00%	200.00%	0.00%	0.00%
Holiday Impact - other days	-100.00%	-100.00%	-34.19%	-26.09%	-100.00%	-18.01%	-15.70%
Holiday Impact - Adj	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Affected Days Impact - Adj	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Holiday Impact - Final	0.00%	0.00%	0.00%	0.00%	200.00%	0.00%	0.00%
Affected Days Impact - Final	-100.00%	-100.00%	-34.19%	-26.09%	-100.00%	-18.01%	-15.70%

Line Item Formula							
Average Data (excl Holidays) Products by Fake Day Historic.Base Data[SUM: Fake Days Settings.Day of Week] / Fake Days Settings.Base Data Count[SUM: Fake Days Settings.Day of Week]							
	Formula	Parent	Is Summary	Format	Appl		
Products Data by DOW					P1 Products, Days of Week		
Average Data (excl Holidays)	Products by Fake Day Historic.Base Data[SUM: Fake Days Settings.Day of Week]		<input type="checkbox"/>	Number	-		None
Average Holiday	Products by Fake Day Historic.Holiday?[SUM: Fake Days Settings.Day of Week]		<input type="checkbox"/>	Number	-		None
Average Affected	Products by Fake Day Historic.Affected Days?[SUM: Fake Days Settings.Day of Week]		<input type="checkbox"/>	Number	-		None
Holiday Impact - day itself	Average Holiday / 'Average Data (excl Holidays)'	Holiday Impact	<input type="checkbox"/>	Number	-		None
Holiday Impact - other days	Average Affected / 'Average Data (excl Holidays)' - 1	Affected Days Impact	<input type="checkbox"/>	Number	-		None
Holiday Impact - Adj		Holiday Impact	<input type="checkbox"/>	Number	-		None
Affected Days Impact - Adj		Affected Days Impact	<input type="checkbox"/>	Number	-		None
Holiday Impact - Final	'Holiday Impact - day itself' + 'Holiday Impact - Adj'		<input checked="" type="checkbox"/>	Number	-		None
Affected Days Impact - Final	'Holiday Impact - other days' + 'Affected Days Impact - Adj'		<input checked="" type="checkbox"/>	Number	-		None

14. Now let's use these values in our forecast. We will create a module dimensioned by real time, but again we'll use a Time Range to restrict the calculations to FY20 only. I have assumed that the Baseline Forecast is a manual input, although this is most likely to have been calculated from another source.

Note that in the forecast the equivalent holiday is Friday 10th January.

The formulae are not too tricky

- ## Best practice tips

- We do use a subsidiary view for Day of the Week because this does not apply to products, and we want to display the Day of the Week to help understand and validate the calculation.
- Also, because we expect most days not to be affected by holidays, we check for that first and return zero most of the time

I hope this helps, there are obviously lots of variations. The common ones I've used are:

- If you want to track different events individually you could add an events dimension to the modules
- You could use a rolling average to work out the base line calculation in 13 is your business is very seasonal
- You could do all of the calculations for another dimension such as Brand, if the impact of certain events affects brands in different ways