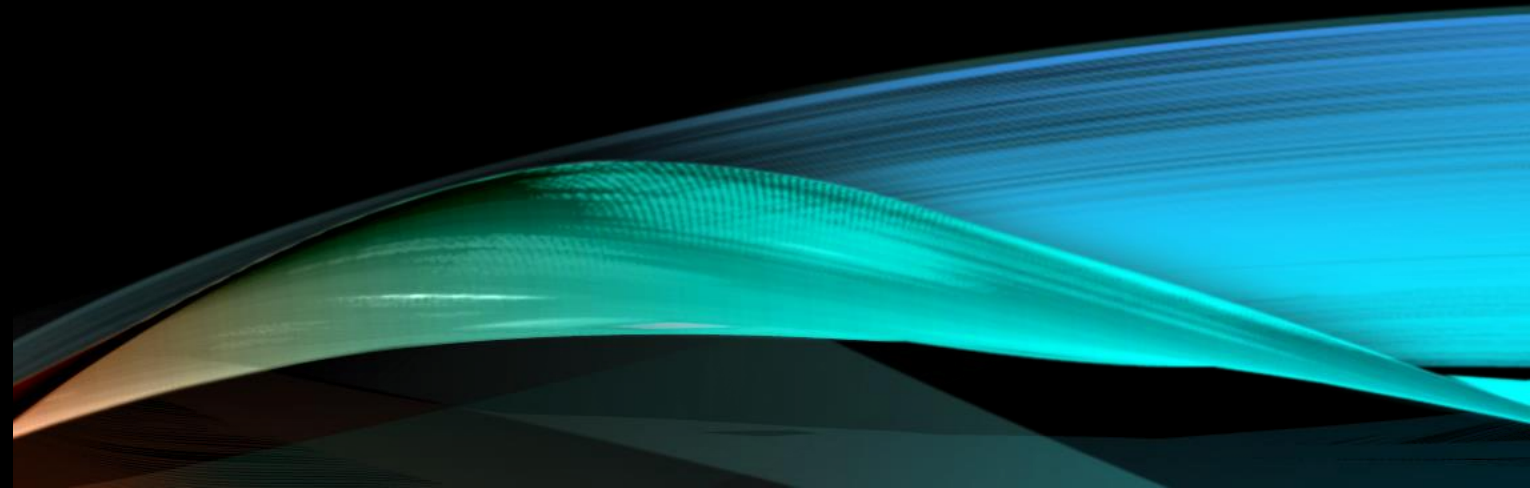




NEW STARS
OF DATA

MULTI DEVELOPER SCENARIO IN ANALYSIS SERVICES WITH TABULAR EDITOR, SOURCETREE & BITBUCKET

Ann-Kathrin Nies & Steffen Genz

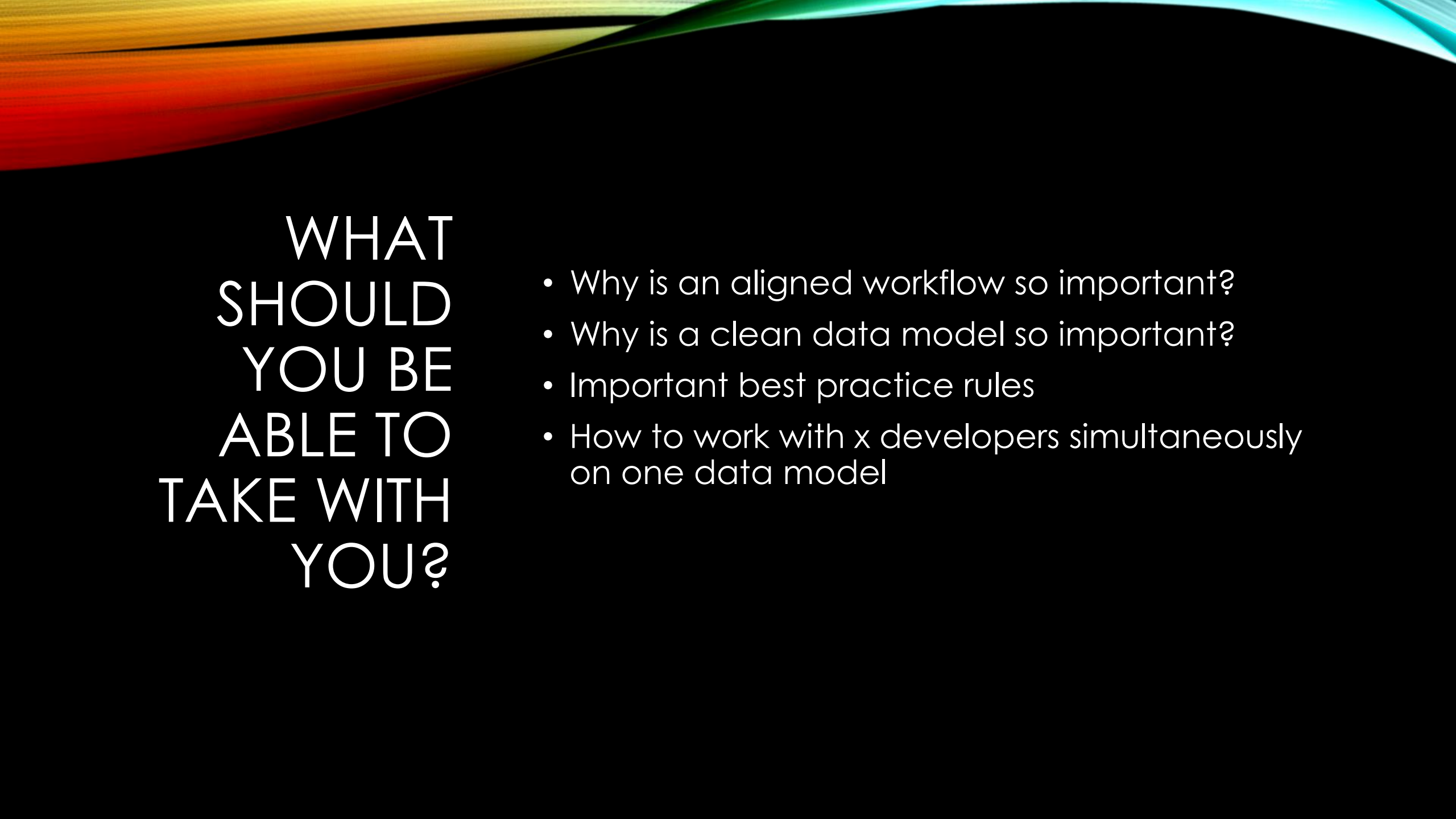




WHO WE ARE?

- We work for AXRO - a Wholesaler for Office Supplies from Hamburg
- We analyze a large amount of data every day, mainly for our sales, purchase, eCommerce & logistic teams
- We (Ann-Kathrin & Steffen) love to work with PowerBI & Tabular Editor 3 every day 😊





WHAT SHOULD YOU BE ABLE TO TAKE WITH YOU?

- Why is an aligned workflow so important?
- Why is a clean data model so important?
- Important best practice rules
- How to work with x developers simultaneously on one data model



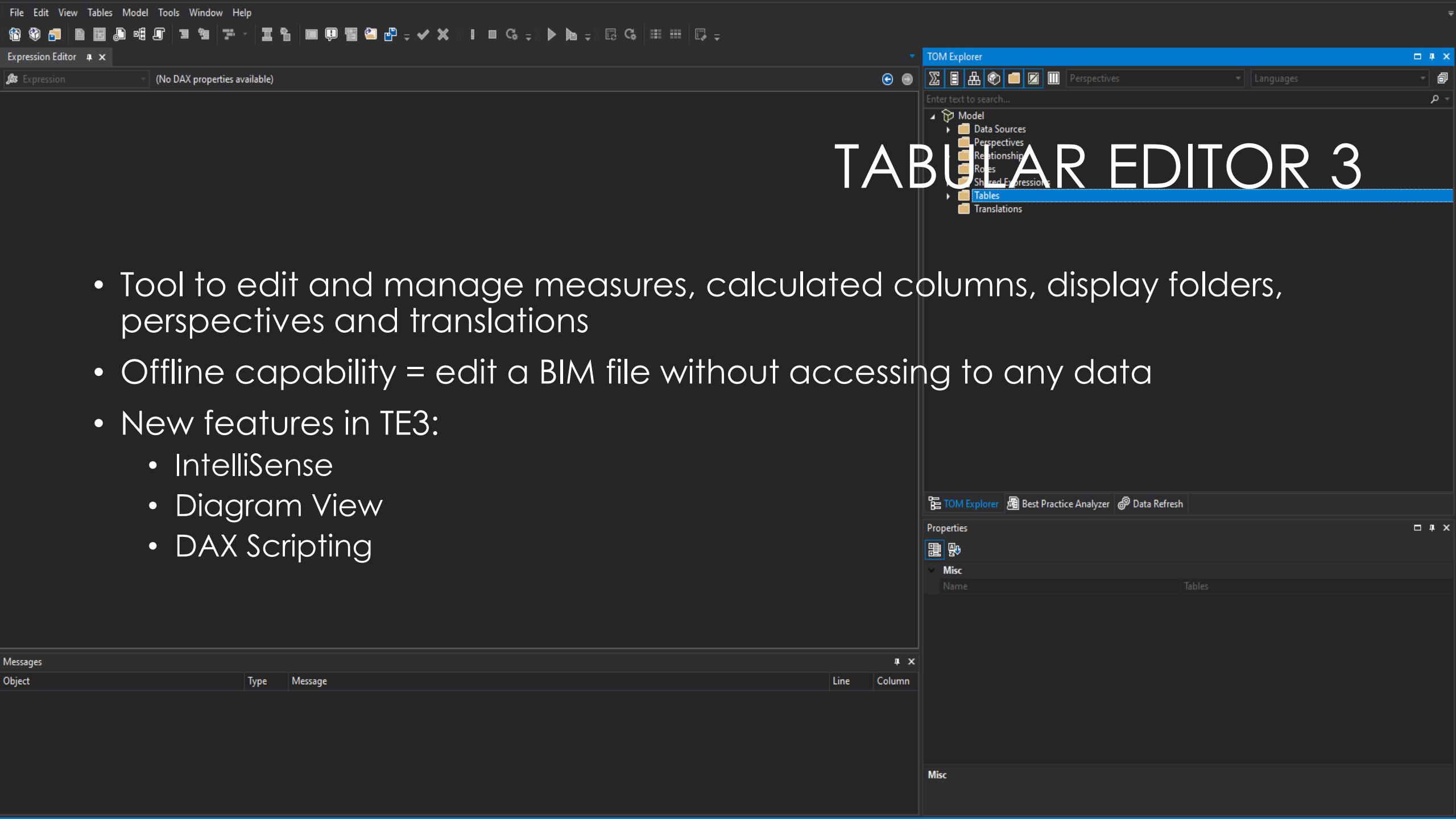
OUR REQUIREMENTS / GOALS

- Two or more authors but **one „signature“**
>>> You need **similar workflows** and the **same „rules“**
- **Measures should be reusable**
>>> as few measures as possible
- **We have a lot of user feedback!** They love us, we love them, so our data model usually grows fast over the years



Tabular Editor 3

OUR TOOLSET



TABULAR EDITOR 3

- Tool to edit and manage measures, calculated columns, display folders, perspectives and translations
- Offline capability = edit a BIM file without accessing to any data
- New features in TE3:
 - IntelliSense
 - Diagram View
 - DAX Scripting

INTELLISENSE

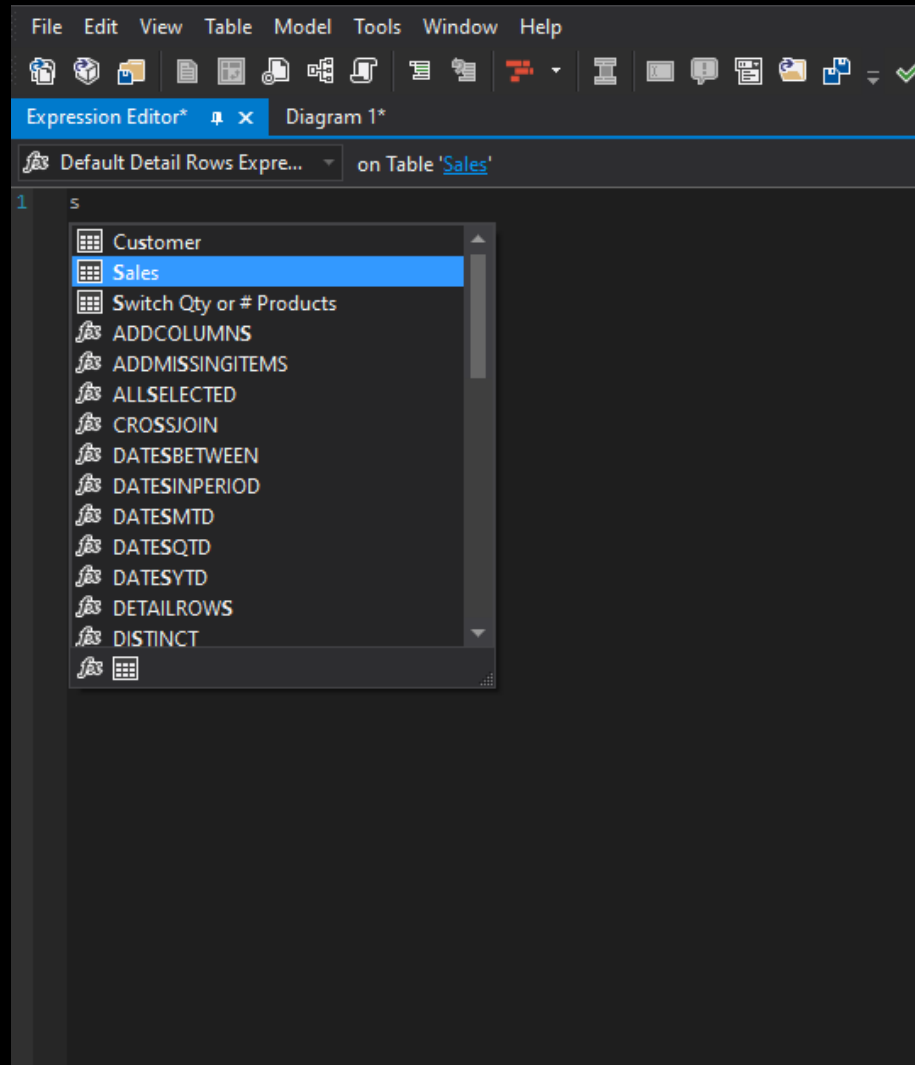
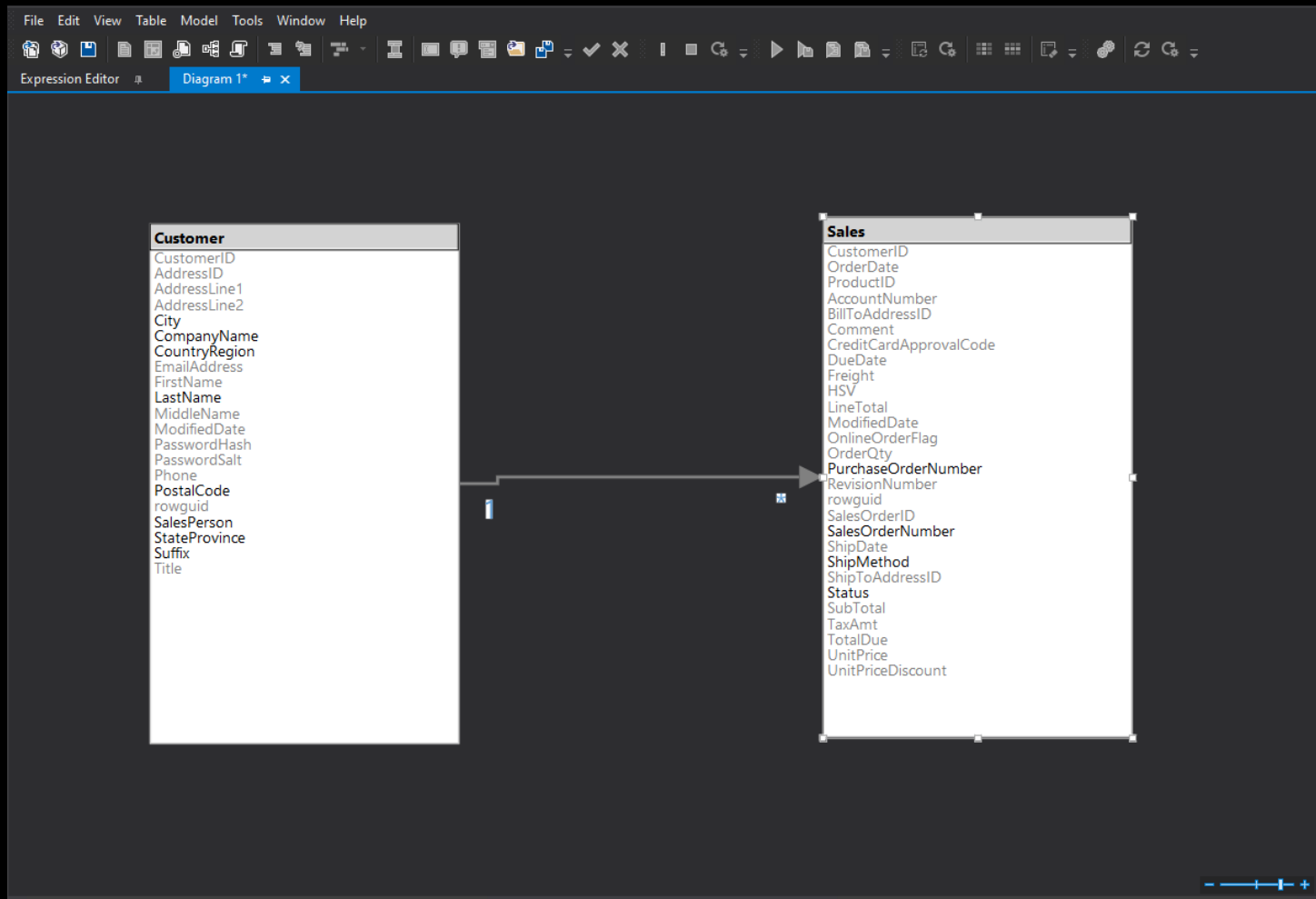
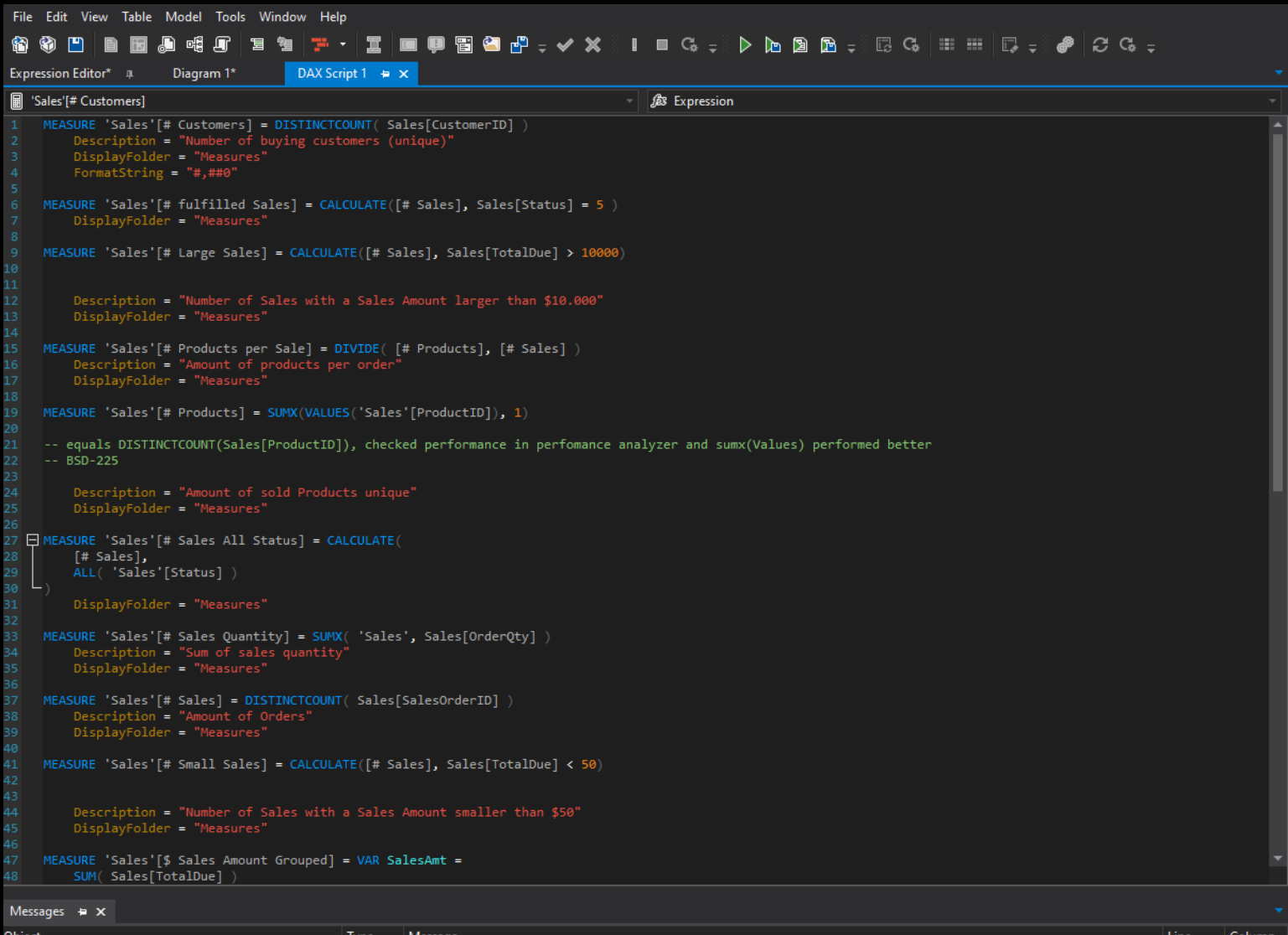


DIAGRAM VIEW



DAX SCRIPTING



```
File Edit View Table Model Tools Window Help
Expression Editor* Diagram 1* DAX Script 1 x
'Sales'[# Customers] Expression
1 MEASURE 'Sales'[# Customers] = DISTINCTCOUNT( Sales[CustomerID] )
2   Description = "Number of buying customers (unique)"
3   DisplayFolder = "Measures"
4   FormatString = "#,##0"
5
6 MEASURE 'Sales'[# fulfilled Sales] = CALCULATE([# Sales], Sales[Status] = 5 )
7   DisplayFolder = "Measures"
8
9 MEASURE 'Sales'[# Large Sales] = CALCULATE([# Sales], Sales[TotalDue] > 10000)
10
11   Description = "Number of Sales with a Sales Amount larger than $10.000"
12   DisplayFolder = "Measures"
13
14 MEASURE 'Sales'[# Products per Sale] = DIVIDE( [# Products], [# Sales] )
15   Description = "Amount of products per order"
16   DisplayFolder = "Measures"
17
18 MEASURE 'Sales'[# Products] = SUMX(VALUES('Sales'[ProductID]), 1)
19
20 -- equals DISTINCTCOUNT(Sales[ProductID]), checked performance in performance analyzer and sumx(Values) performed better
21 -- BSD-225
22
23   Description = "Amount of sold Products unique"
24   DisplayFolder = "Measures"
25
26 MEASURE 'Sales'[# Sales All Status] = CALCULATE(
27   [# Sales],
28   ALL( 'Sales'[Status] )
29 )
30   DisplayFolder = "Measures"
31
32 MEASURE 'Sales'[# Sales Quantity] = SUMX( 'Sales', Sales[OrderQty] )
33   Description = "Sum of sales quantity"
34   DisplayFolder = "Measures"
35
36 MEASURE 'Sales'[# Sales] = DISTINCTCOUNT( Sales[SalesOrderID] )
37   Description = "Amount of Orders"
38   DisplayFolder = "Measures"
39
40 MEASURE 'Sales'[# Small Sales] = CALCULATE([# Sales], Sales[TotalDue] < 50)
41
42   Description = "Number of Sales with a Sales Amount smaller than $50"
43   DisplayFolder = "Measures"
44
45 MEASURE 'Sales'[$ Sales Amount Grouped] = VAR SalesAmt =
46   SUM( Sales[TotalDue] )
47
48
```

BEST PRACTICE RULES



#1 FOLDERS FOR MEASURES & FILTERS / HIDE ALL UNUSED COLUMNS

- **Better structure** and **readability** of the model
 - Emphasize **important Measures** by separating them into folders
 - Useful for yourself but also for **Power Users** who use your Calculated Columns and Measures for their PowerBI visualizations
- Only what **is really used** in the frontend **should be displayed**
- Columns that are **only used to build relationships are hidden**, additionally we put them into folders



'Customer'



TOM Explorer



Perspectives

Languages

Enter text to search...

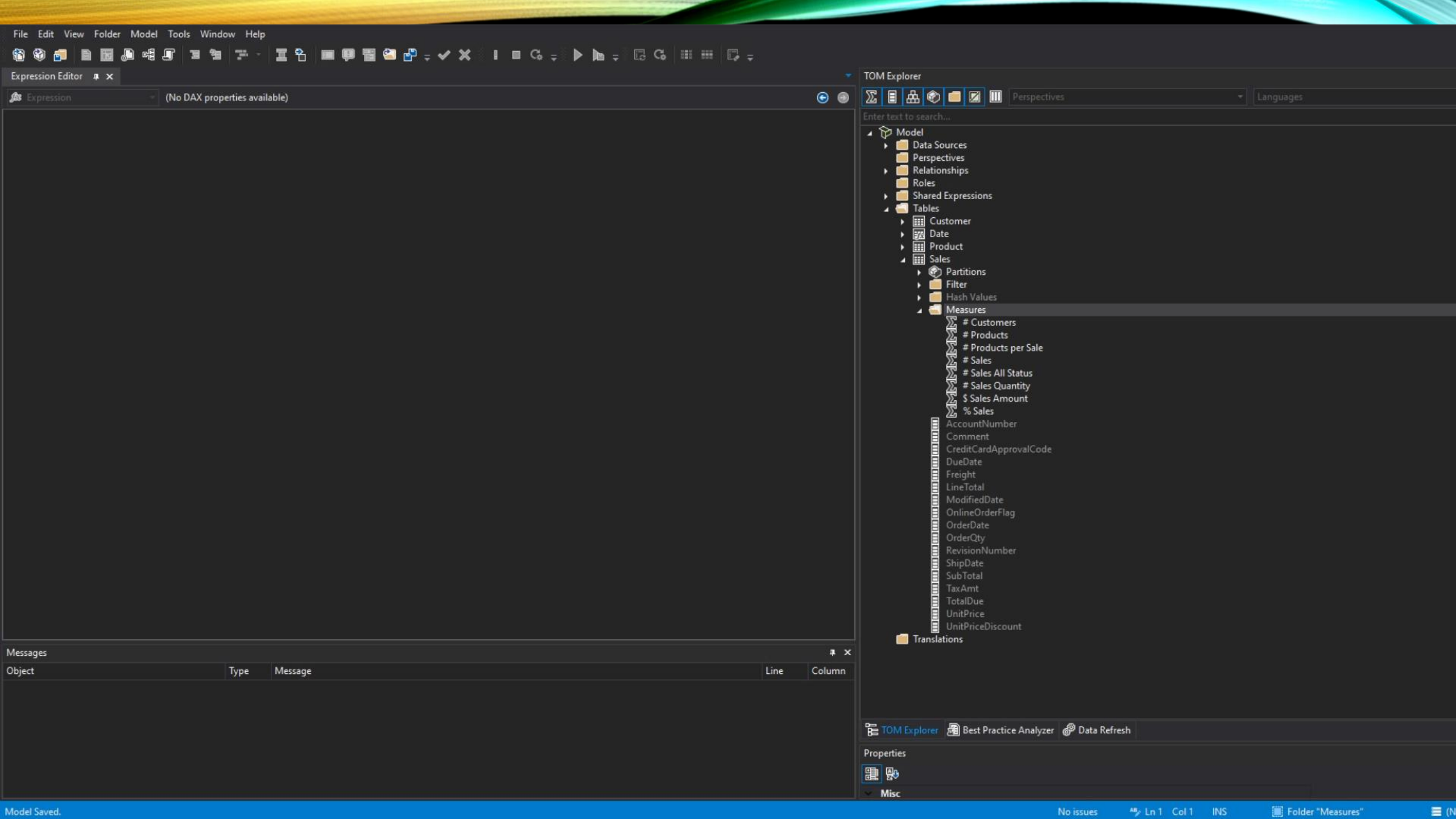
- Model
 - Data Sources
 - Perspectives
 - Relationships
 - Roles
 - Shared Expressions
 - Tables
 - Customer
 - Date
 - Product
 - Sales
 - Translations



Type	Message	Line	Column
------	---------	------	--------

#2 GIVE MEASURES A PREFIX (% , # , €)

- Naming convention to achieve **consistency**
- Your measures follow **a clear structure**
- Enables quick identification
- # = Count



Expression Editor

Expression (No DAX properties available)

Messages

Object	Type	Message	Line	Column
--------	------	---------	------	--------

TOM Explorer

Enter text to search...

- Model
 - Data Sources
 - Perspectives
 - Relationships
 - Roles
 - Shared Expressions
 - Tables
 - Customer
 - Date
 - Product
 - Sales
 - Partitions
 - Filter
 - Hash Values
 - Measures
 - # Customers
 - # Products
 - # Products per Sale
 - # Sales
 - # Sales All Status
 - # Sales Quantity
 - \$ Sales Amount
 - % Sales
- Translations

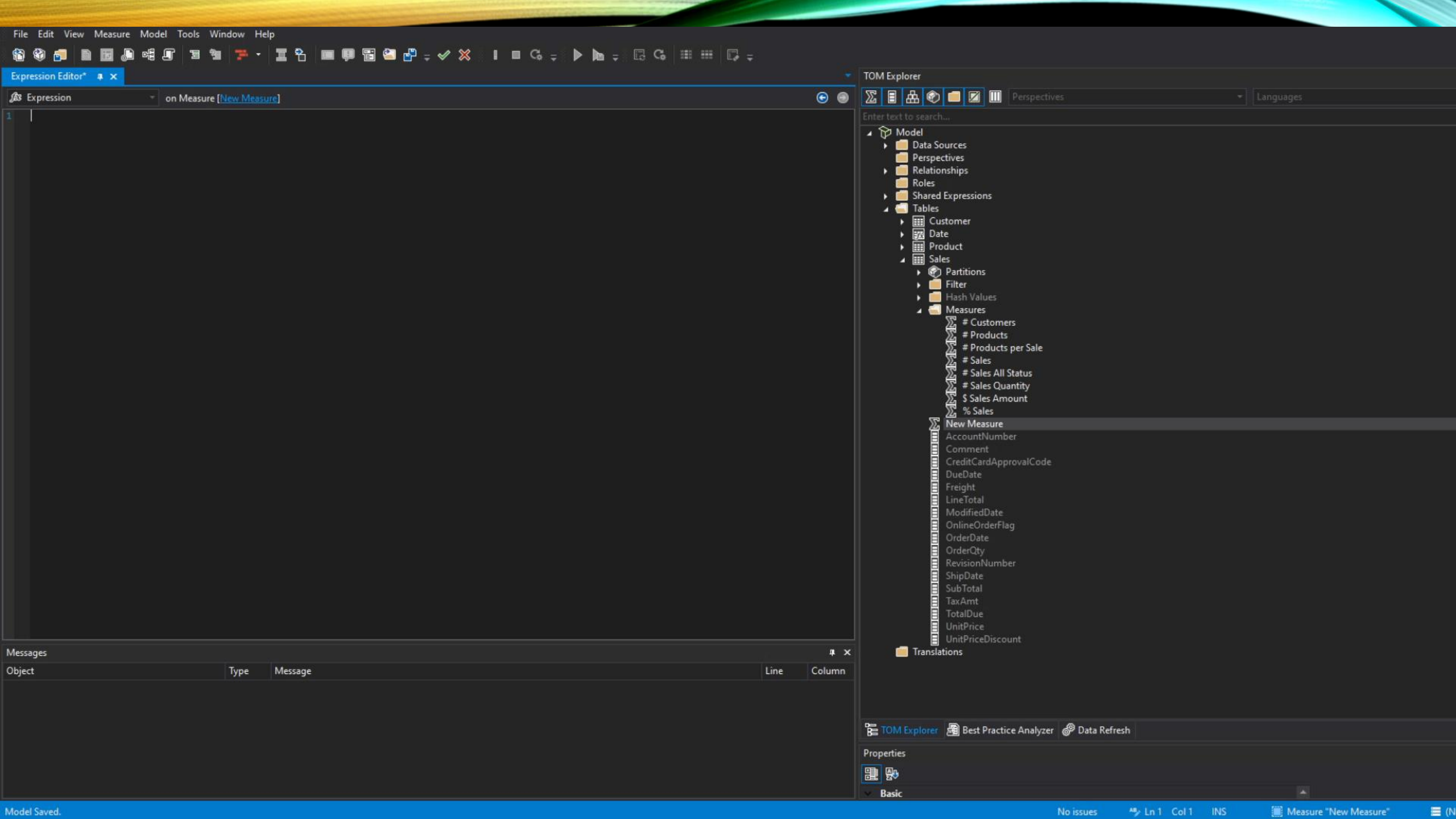
TOM Explorer Best Practice Analyzer Data Refresh

Properties

Misc

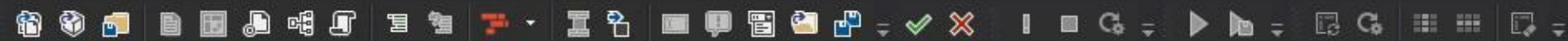
#3 SHOW CALLTIP – LINK TO DAX.GUIDE

- TE3 includes two useful functions: show calltip & link to dax.guide
- If you don't know what the DAX function is all about – it is a neat trick
- It helps to **quickly understand** DAX code
 - >>> it brings clarity when you need it



#4 USE DAXFORMATTER!

- By using the DAX FORMATTER the code gets much **easier to read!**
- Functions are automatically formatted, especially useful for long or nested DAX code
- Troubleshooting is by far easier (e.g.: a missing parenthesis)



Expression Editor*

Expression on Measure [New Measure](#)

```
1 VAR SalesAmt = SUM( Sales[TotalDue] ) Return IF( SalesAmt > 10000, 1, IF( SalesAmt > 1000, 2, IF( SalesAmt > 500, 3, IF( SalesAmt > 100, 4, 5 ) ) ) )
```

#5 WRITE DESCRIPTIONS FOR USERS

- Especially useful when having different Power Users who work with the data model
- You will save yourself a lot of "questions" and mistakes

FileEditViewMeasureModelToolsWindowHelp

Expression Editor

on Measure [# Large Sales]

1

2

3

CALCULATE([# Sales], Sales[TotalDue] > 10000)

Messages

Object	Type	Message	Line	Column
--------	------	---------	------	--------

TOM Explorer

Perspectives

Languages

Enter text to search...

Partitions

Filter

Measures

Customers

fulfilled Sales

Large Sales

Products

Products per Sale

Sales

Sales All Status

Sales Quantity

\$ Sales Amount

\$ Sales Amount Grouped

\$Freight

% Sales

Test

TestForNewStars

TOM Explorer

Best Practice Analyzer

Data Refresh

Properties

Basic

Description

Display Folder

Format String

Hidden

Name

Metadata

Annotations

Data Type

DAX identifier

Error Message

Extended Properties

Object Type

State

Misc

Handler

Options

Detail Rows Expression

Expression

KPI

Number of Sales with a Sales Amount larger than \$10,000

Measures

False

Large Sales

0 annotations

Integer / Whole Number (int64)

[# Large Sales]

0 extended properties

Measure

Ready

TabularEditor.TOMWrapper.TabularModelHandler

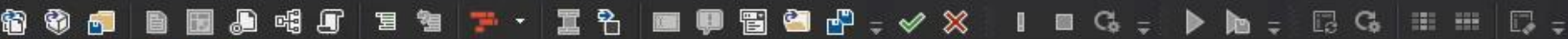




CALCULATE([# Sales], Sales[TotalDue] > 10000)

Description

The description of the measure, visible to developers at design time and to administrators in management tools, such as SQL Server Management Studio.

#6 WRITE COMMENTS FOR YOUR CO-AUTHOR

- To help each other – you're not alone anymore!
- Let your co-authors know why you wrote a measure the way you did
- We use our **ticket numbers** inside our Measures >>> you still know years later why you did something

Expression Editor*  Expression on Measure [\[# Products\]](#)  

```
SUMX(VALUES('Sales'[ProductID]), 1)
```

```
-- equals DISTINCTCOUNT(Sales[ProductID]), checked performance in performance analyzer and sumx(Values) performed better
```

```
|
```

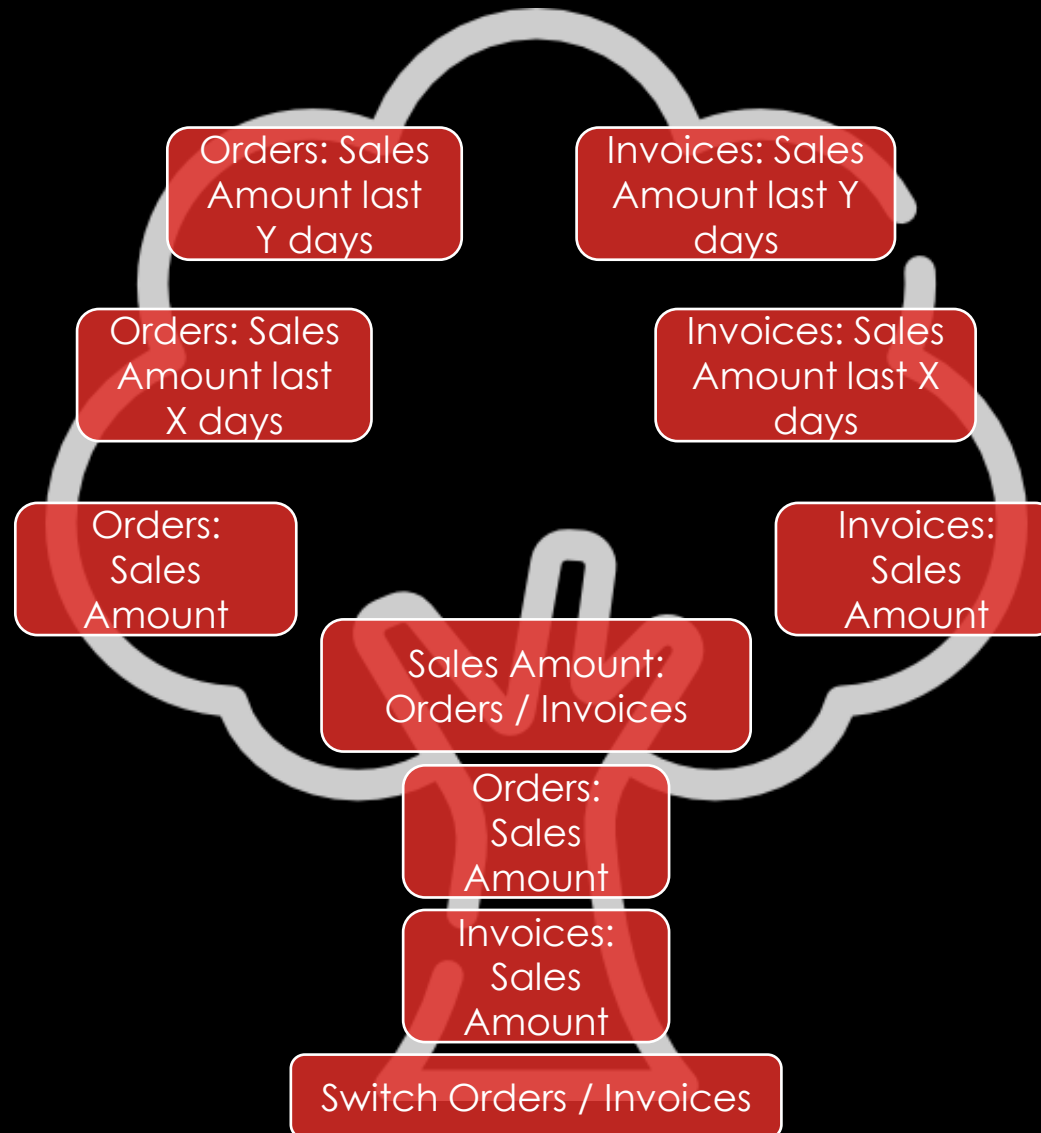

#7 MEASURE TREE

Idea behind it:

You can change between two measures with a “switch”.

Example: We have two fact tables. One for the invoices one for the order. You want the user to be able to switch between two measures in the same matrix **without changing his view.**

MEASURE TREE



FileEditViewModelToolsWindowHelp

Expression Editor

on Measure [# Sales Quantity or # Products]

1

2

3

4

5

6

```
VAR ParaQty =  
    SELECTEDVALUE( 'Switch Qty or # Products'[ID] )  
VAR Qty = [# Sales Quantity]  
VAR Prods = [# Products]  
RETURN  
    SWITCH( ParaQty, 1, Qty, Prods )
```

TOM Explorer

PerspectivesLanguages

Enter text to search...

Model

Data Sources

Perspectives

Relationships

Roles

Shared Expressions

Tables

Customer

Date

Product

Sales

Switch Qty or # Products

Translations

Messages

ObjectTypeMessageLineColumn

TOM ExplorerBest Practice AnalyzerData Refresh

Properties

Error Message

Object Type

Misc

HandlerTabularEditor.TOMWranner.TabularModelHandler

Misc

#8 CHECK YOUR DEPENDENCIES EVERY NOW AND THEN

- Tabular Editor enables you to check **dependencies of your measures**
- Enhances the ability to keep track of the structure of your model
- TE2: press F3
- TE3: press Shift + F12



Expression Editor

on Table 'Switch Qty or # Products'

```
1 DATATABLE (  
2     "ID", INTEGER,  
3     "Filter Qty or Prods", STRING,  
4     (  
5         { 1, "# Quantity" },  
6         { 2, "# Products" }  
7     )  
8 )
```

TOM Explorer

Perspectives

Languages

Enter text to search...

- CustomerID
- DueDate
- Freight
- HSV
- LineTotal
- ModifiedDate
- OnlineOrderFlag
- OrderDate
- OrderQty
- ProductID
- RevisionNumber
- rowguid
- SalesOrderID
- ShipDate
- ShipToAddressID
- SubTotal
- TaxAmt
- TotalDue
- UnitPrice
- UnitPriceDiscount
- Switch Qty or # Products**
 - Filter
 - Filter Qty or Prods
 - Measures
 - # Sales Quantity or # Products
 - FürSteffen
 - ID
- Translations

TOM Explorer

Best Practice Analyzer

Data Refresh

Properties



Basic

Description	
Hidden	False
Name	Switch Qty or # Products

Metadata

Annotations	0 annotations
DAX identifier	'Switch Qty or # Products'
Error Message	

Extended Properties

Object Type	Calculated Table
-------------	------------------

Misc

ChildErrorCount	0
Handler	TabularEditor.TOMWrapper.TabularModelHandler

Name

The name of this object. Warning: Changing the name can break formula logic, if Automatic Formula Fix-up is disabled.

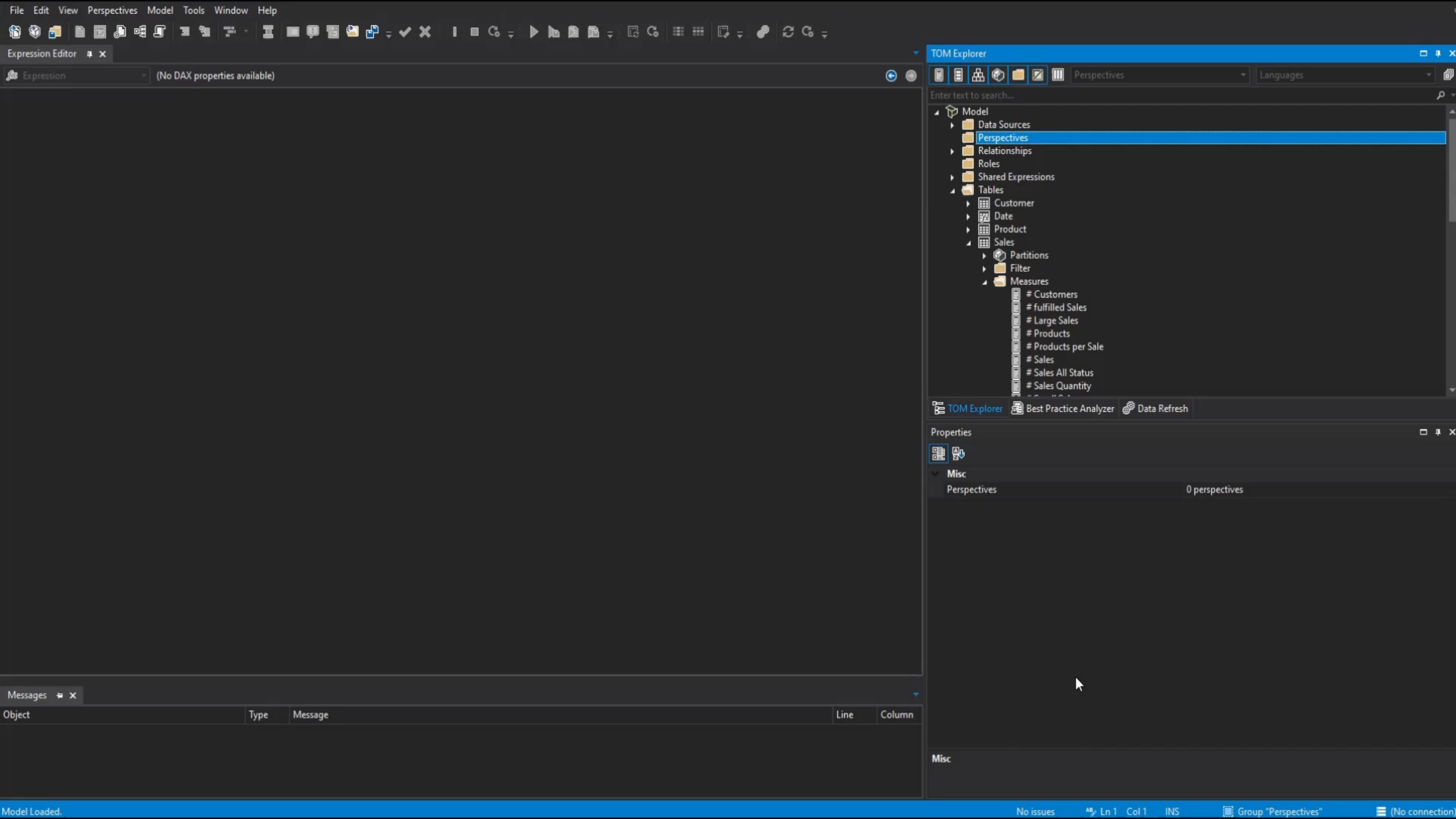
Messages

Object	Type	Message	Line	Column
--------	------	---------	------	--------



#9 USE PERSPECTIVES

- One Data Model for different stakeholders
- Use perspectives to include **relevant data for specific use-case**
- Only relevant data in specific perspective
- Simplifies report building for power users



#10 BEST PRACTICE ANALYZER

- Define global or model-specific rules
- Are rules **violated or fulfilled**?
- For example:
 - Naming Conventions
 - Metadata properties
 - Use of specific measures (e.g.: Divide)

Expression Editor

Expression on Table "Switch Qty or # Products"

```
1 DATATABLE (  
2     "ID", INTEGER,  
3     "Filter Qty or Prods", STRING,  
4     (  
5         { 1, "# Quantity" },  
6         { 2, "# Products" }  
7     )  
8 )
```

Messages

Object	Type	Message	Line	Column
--------	------	---------	------	--------

TOM Explorer

Perspectives

Languages

Enter text to search...

- HSV
- LineTotal
- ModifiedDate
- OnlineOrderFlag
- OrderDate
- OrderQty
- ProductID
- RevisionNumber
- rowguid
- SalesOrderID
- ShipDate
- ShipToAddressID
- SubTotal
- TaxAmt
- TotalDue
- UnitPrice
- UnitPriceDiscount
- Switch Qty or # Products
 - Filter
 - Measures
 - ID
 - Translations

TOM Explorer Best Practice Analyzer Data Refresh

Properties



Basic

Description	
Hidden	False
Name	Switch Qty or # Products

Metadata

Annotations	0 annotations
DAX identifier	'Switch Qty or # Products'
Error Message	
Extended Properties	0 extended properties
Object Type	Calculated Table

Misc

ChildErrorCount	0
Handler	TabularEditor.TOMWrapper.TabularModelHandler

Options

Data Category	
Default Detail Rows Expression	
Expression	DATATABLE ("ID", INTEGER, "Filter Qty or Prods", STRING
Private	False

Name

The name of this object. Warning: Changing the name can break formula logic, if Automatic Formula Fix-up is disabled.

BEST PRACTICES

- #1 Folders for Measures & filters / hide all unused columns
- #2 Give measures a prefix (% , # , €)
- #3 Show Calltip – link to DAX Guide
- #4 Use Daxformatter!
- #5 Write descriptions for users
- #6 Write comments for your co-author
- #7 Measure Tree
- #8 Check your dependencies every now and then
- # 9 Use Perspectives
- #10 Use the Best Practice Analyzer

HOW TO WORK WITH X DEVELOPERS SIMULTANEOUSLY ON ONE DATA MODEL



THE GOAL



Clear communication
with our stakeholders



Two or more Devs could
work independently from
each other



You can deploy several
times a day without
problems



You can see what the
co-developer was doing



OUR TOOLSET

HOW WE STRUCTURE OUR WORK:



dev1

- Sales Tool
- eCommerce Tool



dev2

- Purchase Tool
- Return Merchandise Authorization Tool



dev3

- Logistics

KANBAN BOARD (JIRA)

- Epics = New Tool
(one Dev is mainly responsible for one tool)
- User Stories = we write the requirements in the language of the user + Business Value + Acceptance Criteria
- Tasks = several tasks that fulfill the req. of the user stories
- Bugs

The screenshot displays a Jira Kanban board with the following structure:

- Columns:**
 - AUFGABEN 2**: Contains tasks assigned to Ann-Kathrin.
 - Task: "Ware im Lager nicht vereinnahmt" (Label: FIBU, ID: BSD-183, Status: In Progress).
 - Task: "Lagerbestand als Zeitreihe mit einbauen" (Label: Icebox, ID: BKB-6, Status: Done).
 - IN ARBEIT 7**: Contains tasks assigned to Steffen.
 - Task: "TV Bildschirme re-design" (Label: Icebox, ID: BKB-58, Status: In Progress).
 - Task: "BKB-44 Sales Tool 02 live bringen" (Label: Sales 02, ID: BKB-44, Status: In Progress).
 - Task: "Alle durchschulen" (Label: Sales 02, ID: BKB-47, Status: In Progress).
 - Task: "Diverse Tools" (Label: Diverse Tools, ID: BSD-248, Status: In Progress).
 - Task: "WG: Fibu OP" (Label: FIBU, ID: BSD-232, Status: In Progress).
 - GELÖST / WARTET AUF RÜCKMELDUNG 0**: Empty column for completed tasks.
- Swimlanes:**
 - Ann-Kathrin 6 Vorgänge**: Grouped under the "AUFGABEN 2" column.
 - Steffen 3 Vorgänge**: Grouped under the "IN ARBEIT 7" column.
- Search Bar:** Located at the bottom right, with the text "Es werden nur vor Kurzem geänderte Vorgänge angezeigt" and a search icon.

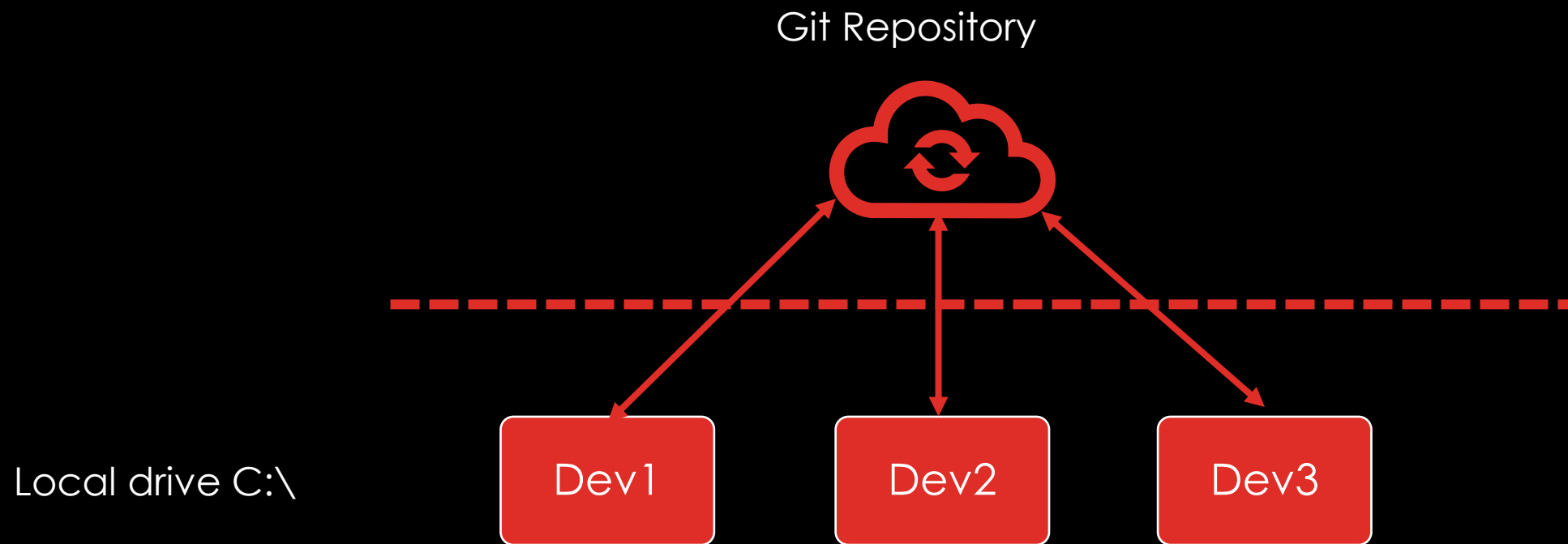
OUR DATA MODEL

- We have one master model
- The master model contains alle the columns & measures from the tools and is deployed several times a day by every developer >>> so you have to be careful:

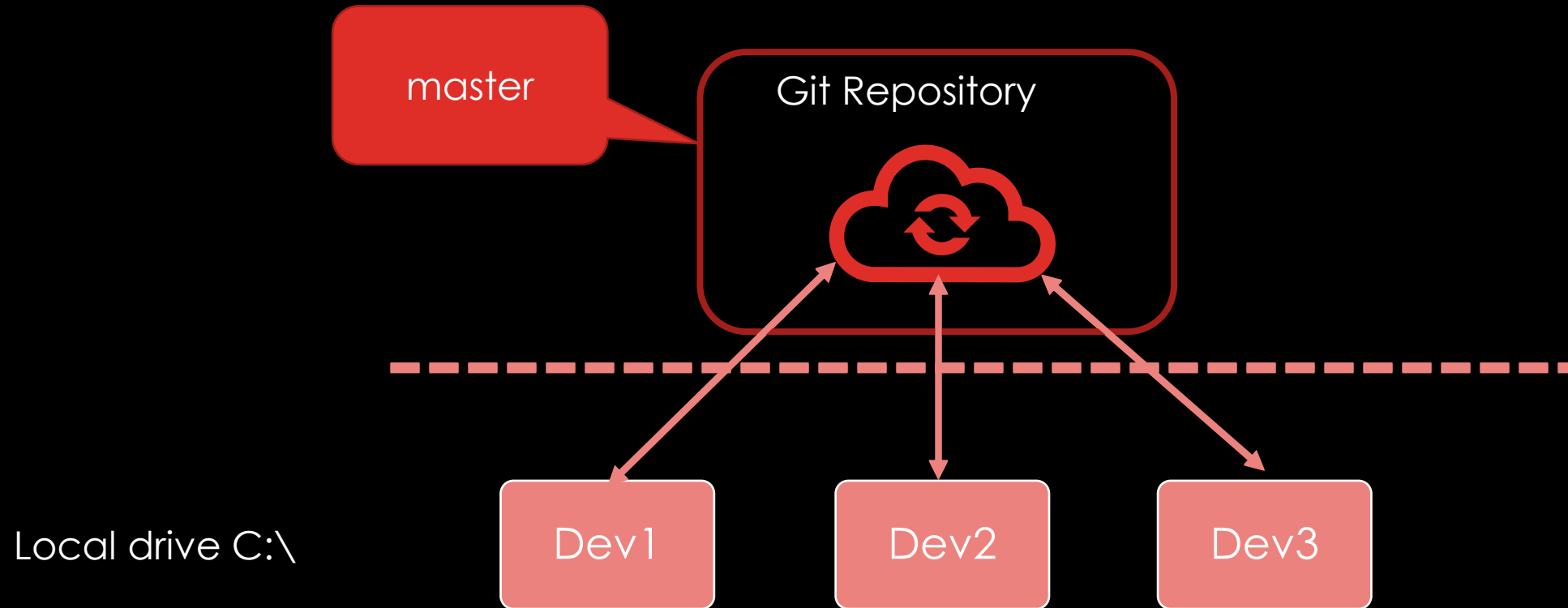


If you **overwrite** the work of your colleague the way to the coffemachine is always a bit harder ;-)

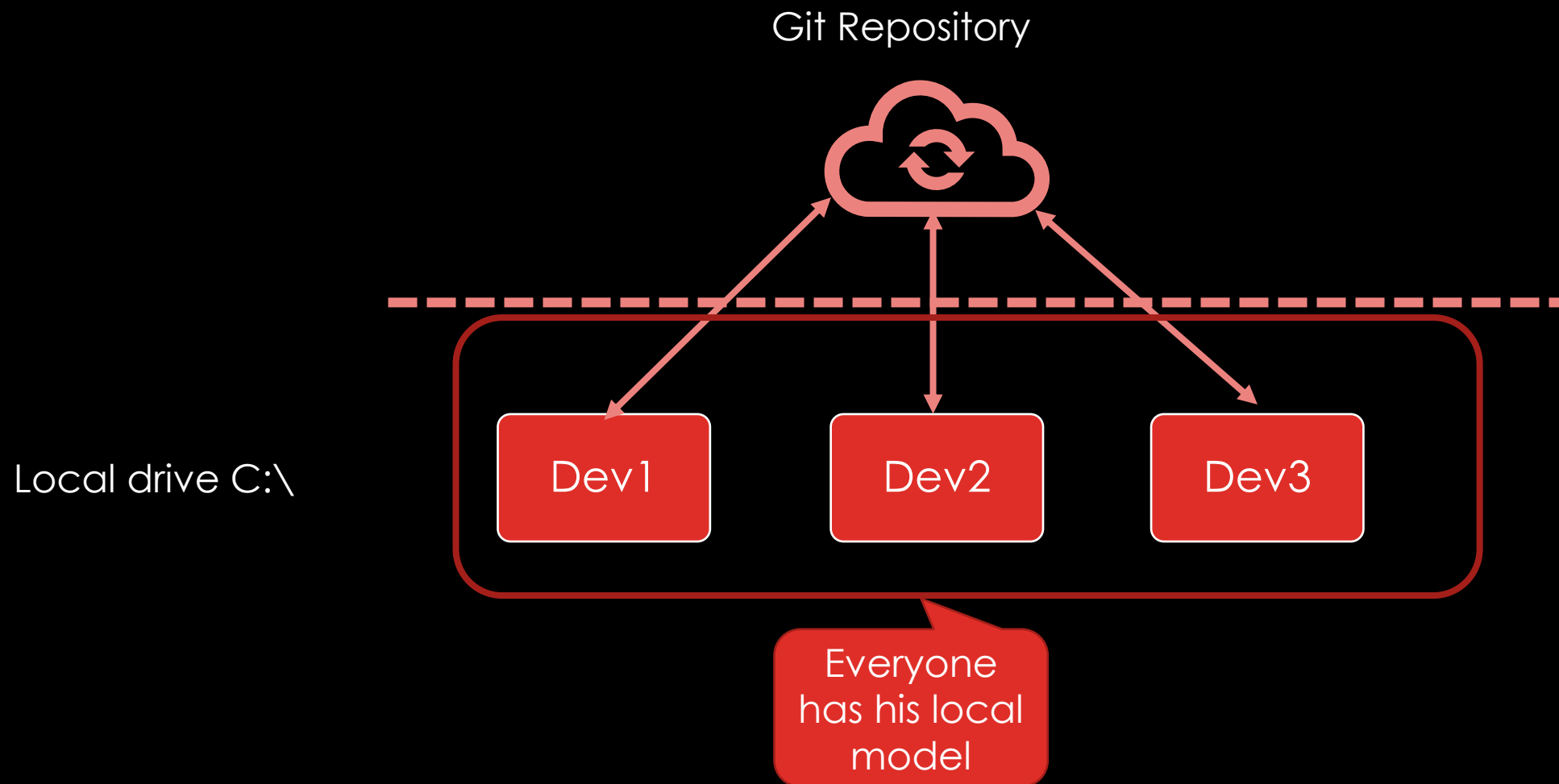
BASIC SCENARIO



MASTER IS HOSTED IN BITBUCKET



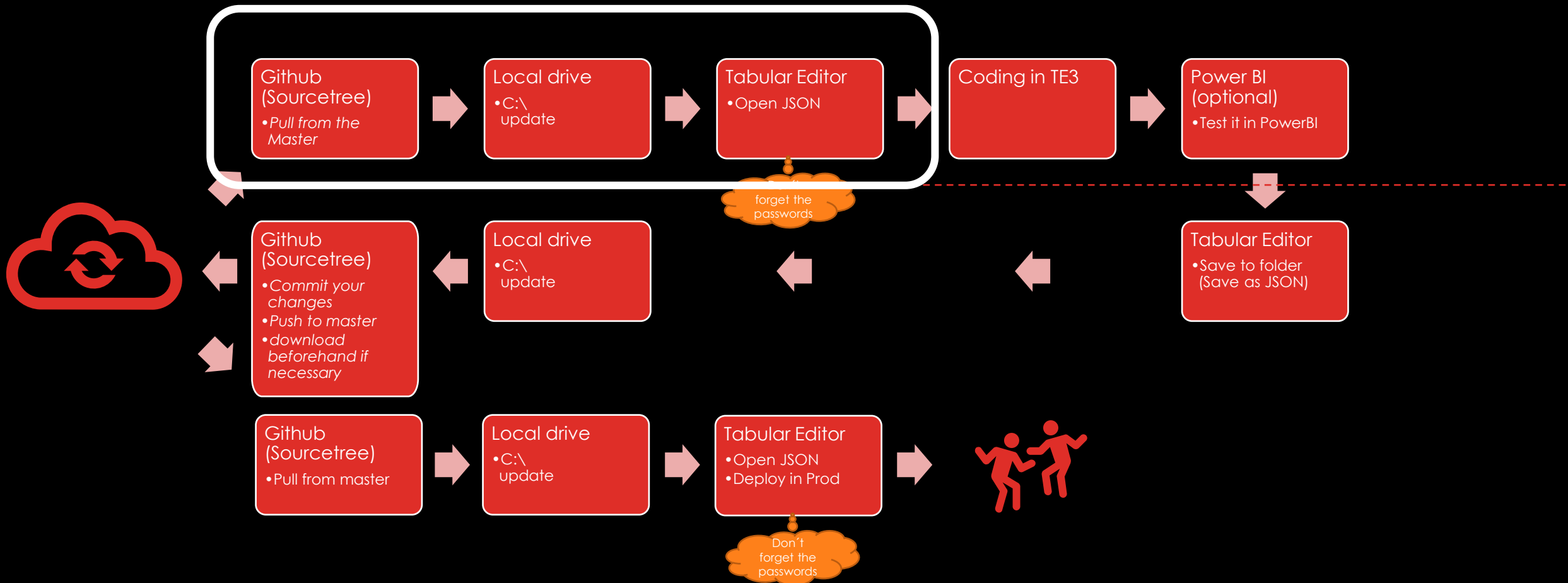
BASIC SCENARIO



HOW TO SETUP BITBUCKET REPOSITORY

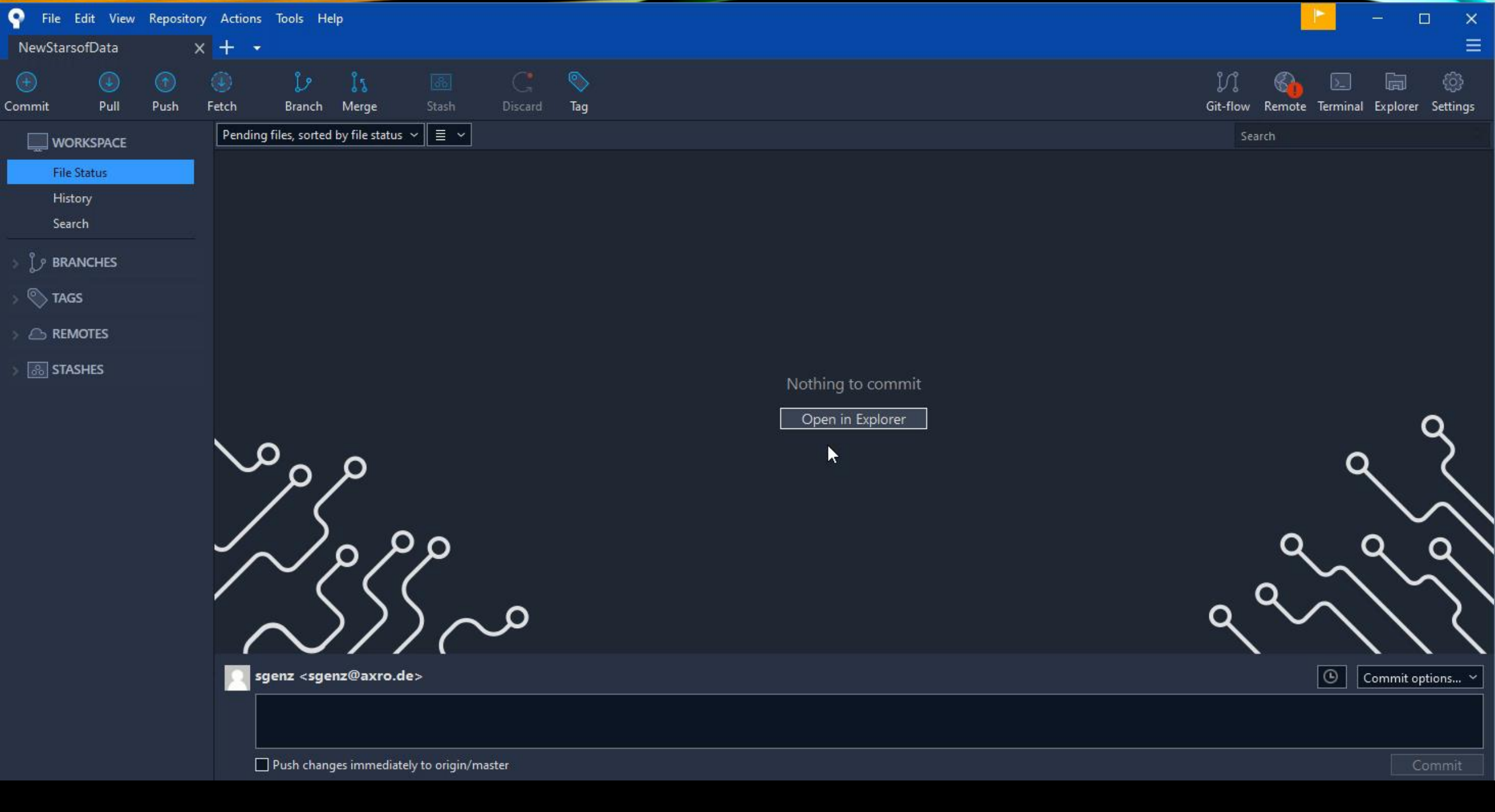
- How you setup a gitmodell in bitbucket:
<https://confluence.atlassian.com/get-started-with-sourcetree/install-and-set-up-sourcetree-847359043.html>

WORKFLOW WITH BITBUCKET

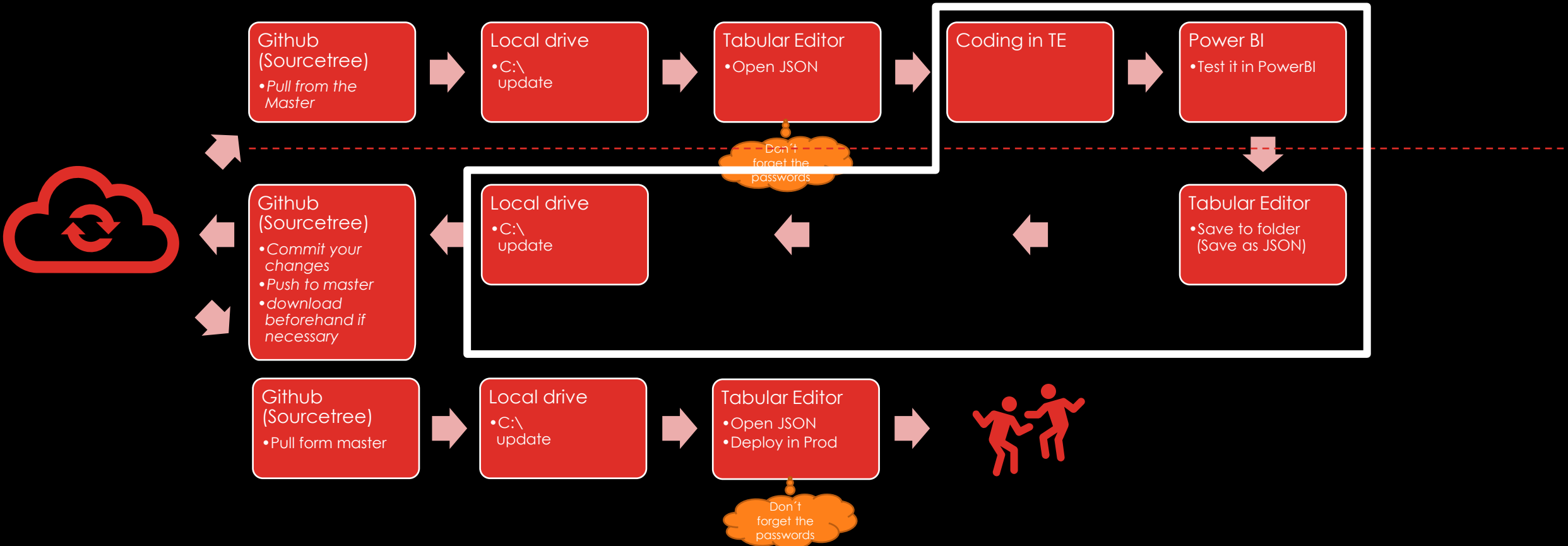




THE PULL PROCESS



WORKFLOW WITH BITBUCKET



SAVE TO FOLDER IN TE3!



DIVIDES A MODEL IN SEVERAL
JSON FILES



EVERY MEASURE, TABLE,
CALCULATED COLUMN IS A
JSON FILE



GIT UPDATES ONLY MODIFIED
JSON'S >>> REALLY FAST

File Edit View Expression Model Tools Window Help

TOM Explorer

Enter text to search...

- Model
 - Data Sources
 - Perspectives
 - Relationships
 - Roles
 - Shared Expressions
 - Tables
 - Customer
 - Date
 - Product
 - Sales
 - Partitions
 - Filter
 - Measures
 - # Customers
 - # fulfilled Sales
 - # Large Sales
 - # Products
 - # Products per Sale
 - # Sales
 - # Sales All Status

Expression Editor

Expression (No DAX properties available)

Properties

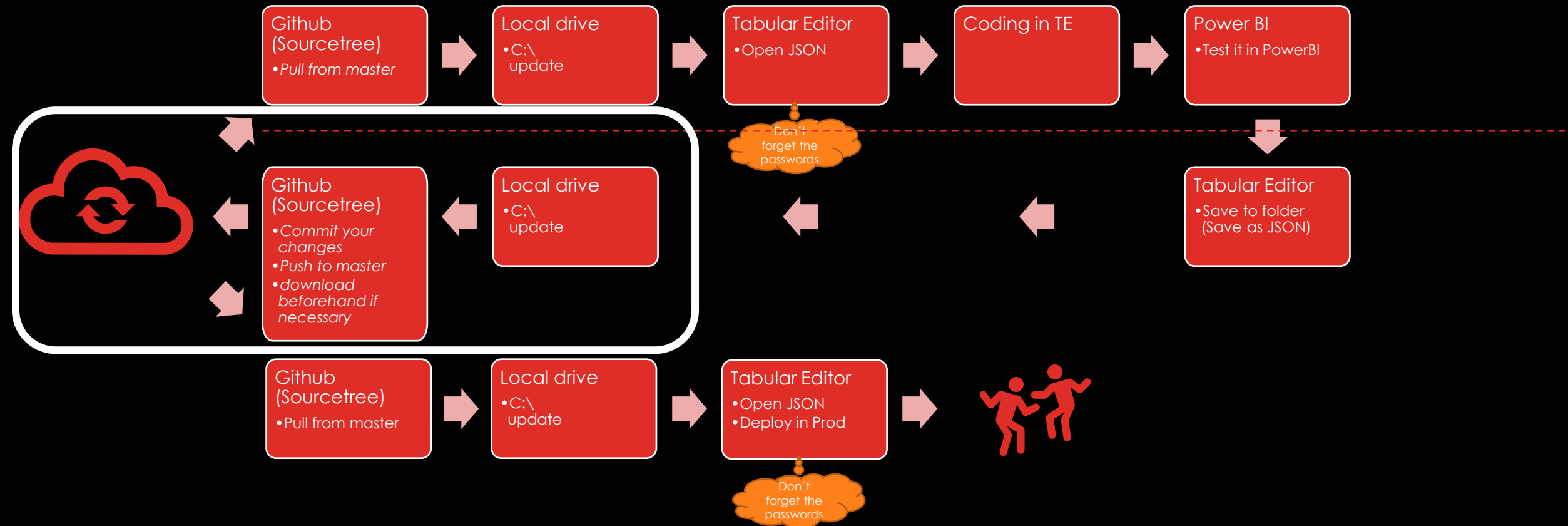
Messages

Object	Type	Message	Line	Column
Source: Analysis Services				
Column 'Date'[Quarter]	Error	Fehler beim Auflösen von Name 'QUARTER'. Es ist kein gültiger Tabellen-, Variablen- oder Funk...	0	0

Model Saved.

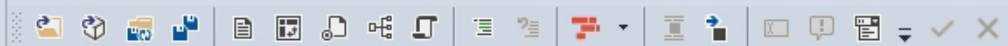
No issues AB Ln 1 Col 1 INS (Nothing selected) SRV-BI01\BI

WORKFLOW WITH BITBUCKET

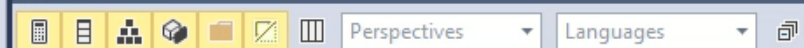




THE PUSH PROCESS



TOM Explorer



tax



TOM Explorer Best Practice Analyzer Data Refresh Macros

Expression Editor

fx Expression on Measure [#TaxAmount]

SUM('Sales'[TaxAmt])

Properties



Basic

Description	
Display Folder	
Format String	
Hidden	False
Name	#TaxAmount

Metadata

Annotations	0 annotations
Data Type	Currency / Fixed Decimal Number (decimal)
DAX identifier	[#TaxAmount]
Error Message	
Extended Properties	0 extended properties
Object Type	Measure
State	Ready

Misc

Handler	TabularEditor.TOMWrapper.TabularModelHandler
---------	--

Options

Detail Rows Expression	
Expression	SUM('Sales'[TaxAmt])
KPI	

Messages

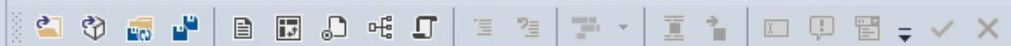
Object	Type	Message	Line	Column
Source: Analysis Services				
Column 'Date'[Quarter]	Error	Fehler beim Auflösen von Name 'QUARTER'. Es ist kein gültiger Tabellen-, Variablen- oder Funk...	0	0

Name

The name of this object. Warning: Changing the name can break formula logic, if Automatic Formula Fix-up is disabled.



THE PULL/PUSH PROCESS



TOM Explorer

Enter text to search...

- Perspectives
- Relationships
- Roles
- Shared Expressions
- Tables
 - Customer
 - Date
 - Product
 - Sales
 - Partitions
 - Filter
 - Measures
 - # Customers
 - # fulfilled Sales
 - # Large Sales
 - # Products
 - # Products per Sale
 - # Sales
 - # Sales All Status
 - # Sales Quantity
 - # Small Sales

TOM Explorer Best Practice Analyzer Data Refresh Macros

Expression Editor

fx Expression (No DAX properties available)

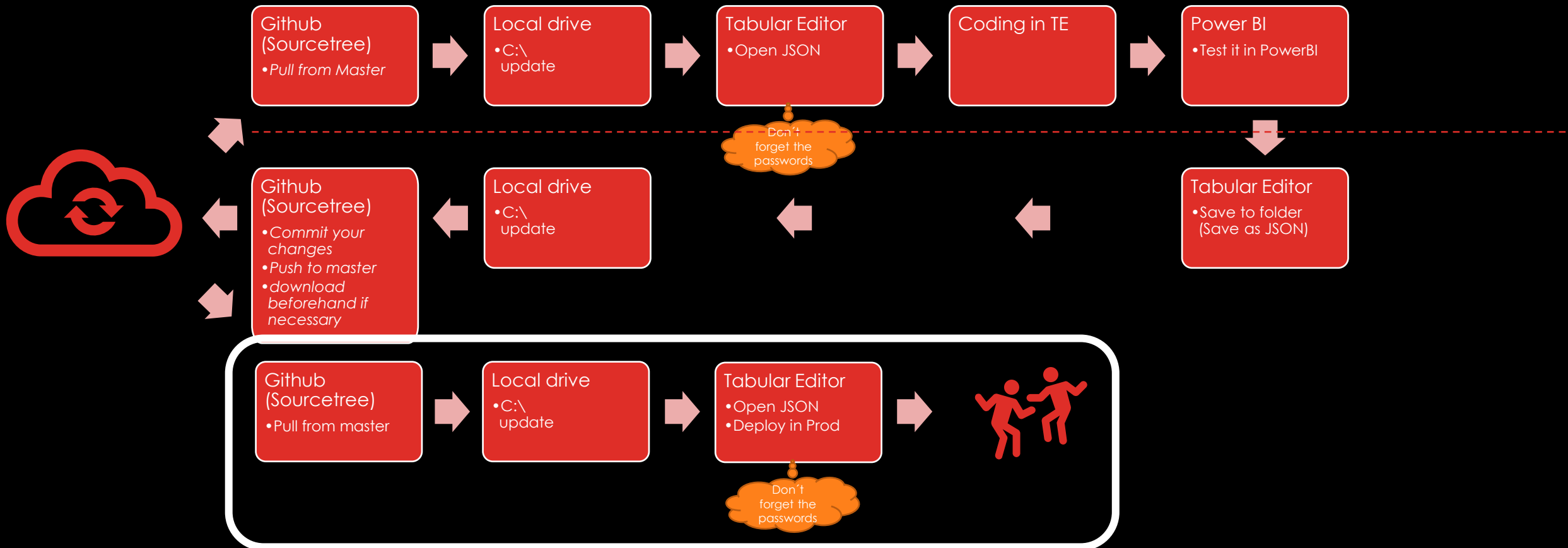
Properties

Properties panel showing various settings and options.

Messages

Object	Type	Message	Line	Column
Source: Analysis Services				
Column 'Date'[Quarter]	Error	Fehler beim Auflösen von Name 'QUARTER'. Es ist kein gültiger Tabellen-, Variablen- oder Funk...	0	0

WORKFLOW WITH BITBUCKET



The image features a solid black background. At the top, there is a decorative, wavy border with a color gradient. From left to right, the colors transition from a bright yellow, through orange and red, into a dark green, and finally into a light cyan/blue at the far right edge. The waves of the border are smooth and fluid, creating a sense of motion.

DEPLOY!

FileEditViewRepositoryActionsToolsHelp

NewStarsofData

CommitPullPushFetchBranchMergeStashDiscardTag

Git-flowRemoteTerminalExplorerSettings

Jump to:

WORKSPACE

File StatusHistorySearch

BRANCHES

TAGS

REMOTES

STASHES

All BranchesShow Remote BranchesDate Order

GraphDescriptionDateAuthorCommit

masterorigin/masterorigin/HEADorderQty

4 Mrz 2021 12:34sgenz <sgenz@axro.de>9606c98

Sales per Customer4 Mrz 2021 12:15AKNies <anies@axro.de>f5e707c

TaxAmount4 Mrz 2021 10:26sgenz <sgenz@axro.de>8aeba81

Small Sales4 Mrz 2021 8:51AKNies <anies@axro.de>f4a0ac1

New Measure3 Mrz 2021 8:24AKNies <anies@axro.de>972459f

Included Switch17 Feb 2021 11:00AKNies <anies@axro.de>d17f168

Fulfilled Sales Measure16 Feb 2021 17:21AKNies <anies@axro.de>05d163e

Merge branch 'master' of https://bitbucket.org/axro-gmbh/axro-bi-tbe-bh-strat16 Feb 2021 17:13AKNies <anies@axro.de>bc92f47

Freight16 Feb 2021 17:12AKNies <anies@axro.de>93c597c

4Freight16 Feb 2021 16:55sgenz <sgenz@axro.de>188d7d1

Large Sales Measure16 Feb 2021 16:17AKNies <anies@axro.de>90fd978

Merge branch 'SteffensTestBranch'16 Feb 2021 16:14sgenz <sgenz@axro.de>850d13b

Test116 Feb 2021 16:06sgenz <sgenz@axro.de>a680ba8

SteffensTestBranch Test16 Feb 2021 14:25sgenz <sgenz@axro.de>cad7e8a

Measures: # Products, # Sales, # Sales Quantity, \$ Sales Amount, # Products per Sale15 Feb 2021 15:20AKNies <anies@axro.de>ff31751

Sorted by file status

Commit: 9606c98a9270be130f47a04003e18a07c8c6ff87 [9606c98]

Parents: f5e707caf2

Author: sgenz <sgenz@axro.de>

Date: Donnerstag, 4. März 2021 12:34:15

Committer: sgenz

orderQty

tables/Sales/measures/#OrderQty.json

File Contents

Reverse hunk

1++{

2++... "name": "#OrderQty",

3++... "expression": "SUM('Sales' [OrderQty])"

4++ }

\\..No newline at end of file

KEY TAKE AWAYS



Tabular Editor 3 is really cool!



A data model is an asset and needs a lot of love – Care for it like a diamond



An aligned workflow is essential to work with two developers and it's worth the effort

QUESTIONS



WE'D LIKE TO HEAR FROM YOU!



Ann-Kathrin Nies



Steffen Genz