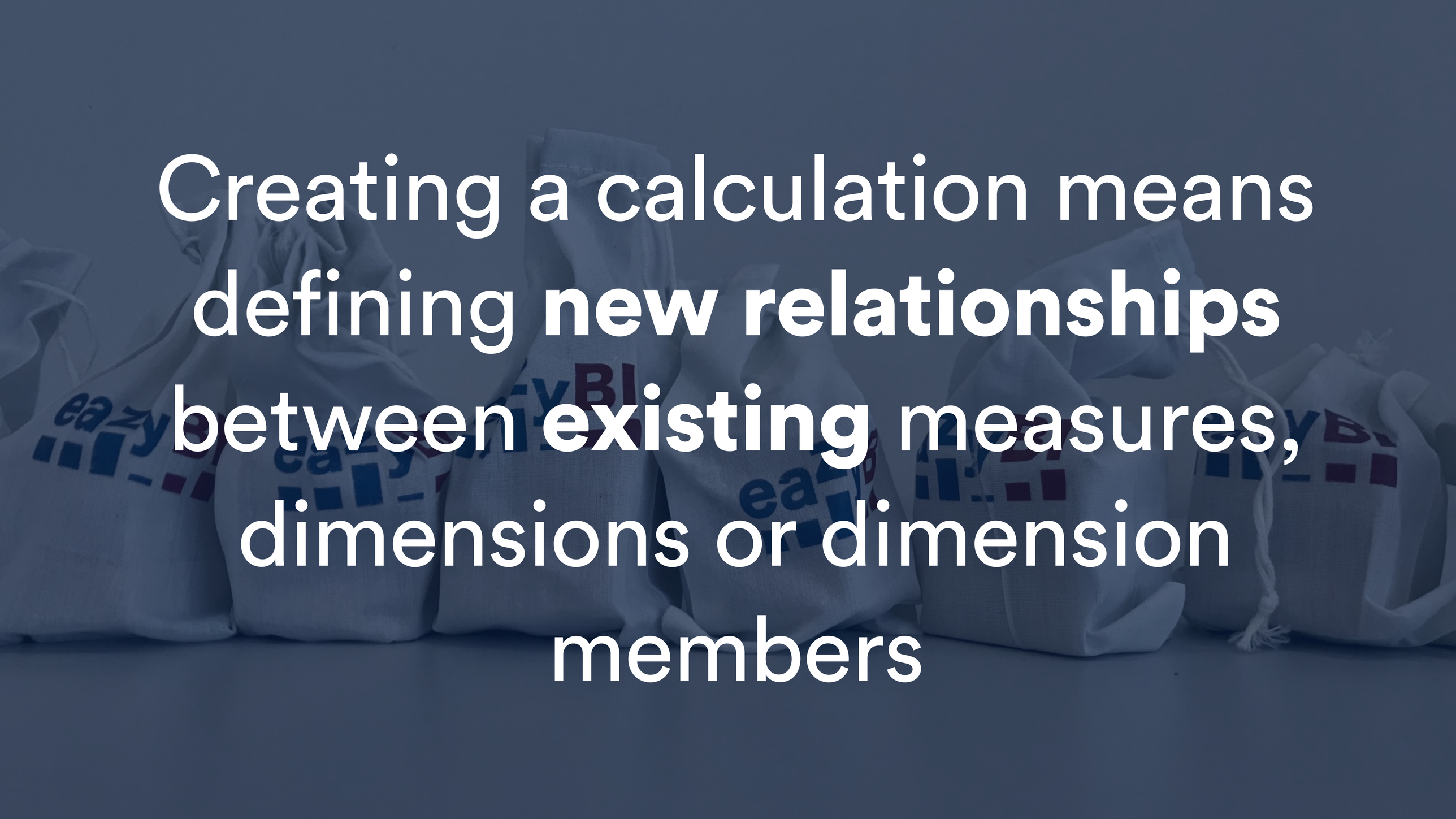
# MDX ABC

Ilze Leite-Apine

## Ilze Leite-Apine

eazyBI
Community Days
May 16-17, 2019
Multidimensional data cube
Understanding Measures & Dimensions
How to put it together?



Creating a calculation means defining **new relationships** between **existing** measures, dimensions or dimension members

## Concept

Understand multidimensional data cube

# How to build relationships

# How to build relationships

## Concept

Understand multidimensional data cube

## Measures & Dimensions

Know the building blocks you already have

# How to build relationships

## Concept

Understand multidimensional data cube

## Measures & Dimensions

Know the building blocks you already have

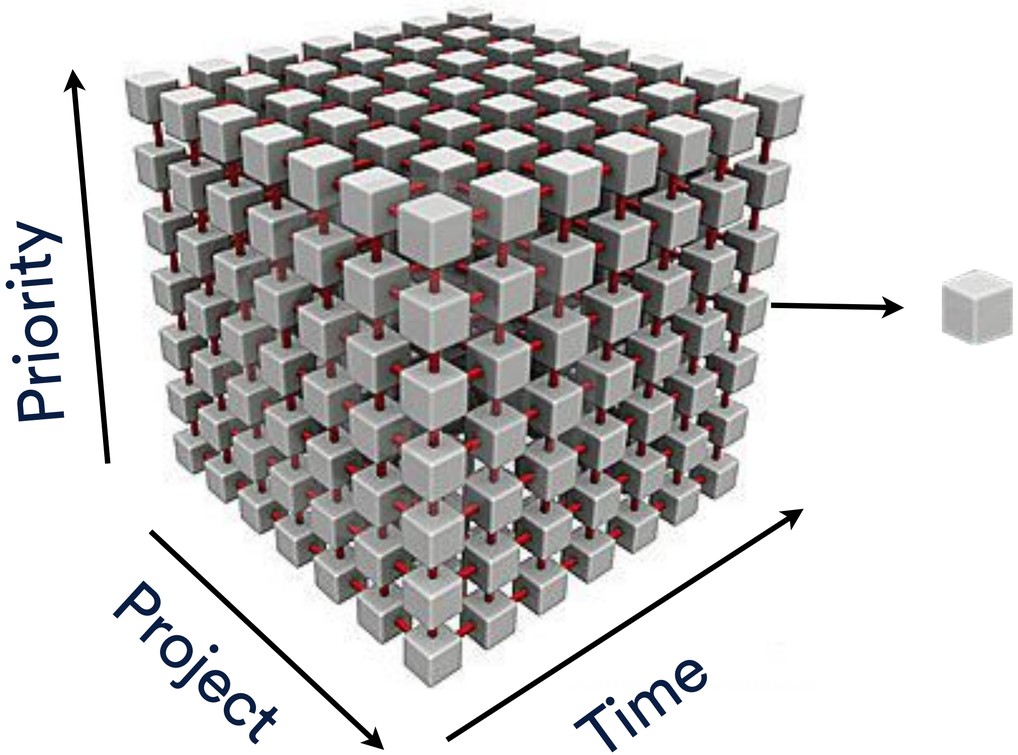
## Put it together

Functions, arguments, and expression types

CONCEPT

# Understand multidimensional data cube

# MULTIDIMENSIONAL CUBE




## Measures

- Issues created
- Issues due
- Issues resolved

# STAR SCHEMA

PROJECT
TIME
ASSIGNEE
Issues created
Issues resolved
....
Original estimated hours
Story points created
Hours spent
STATUS
.....
PRIORITY

## MEASURES & DIMENSIONS

# Know the building blocks you have

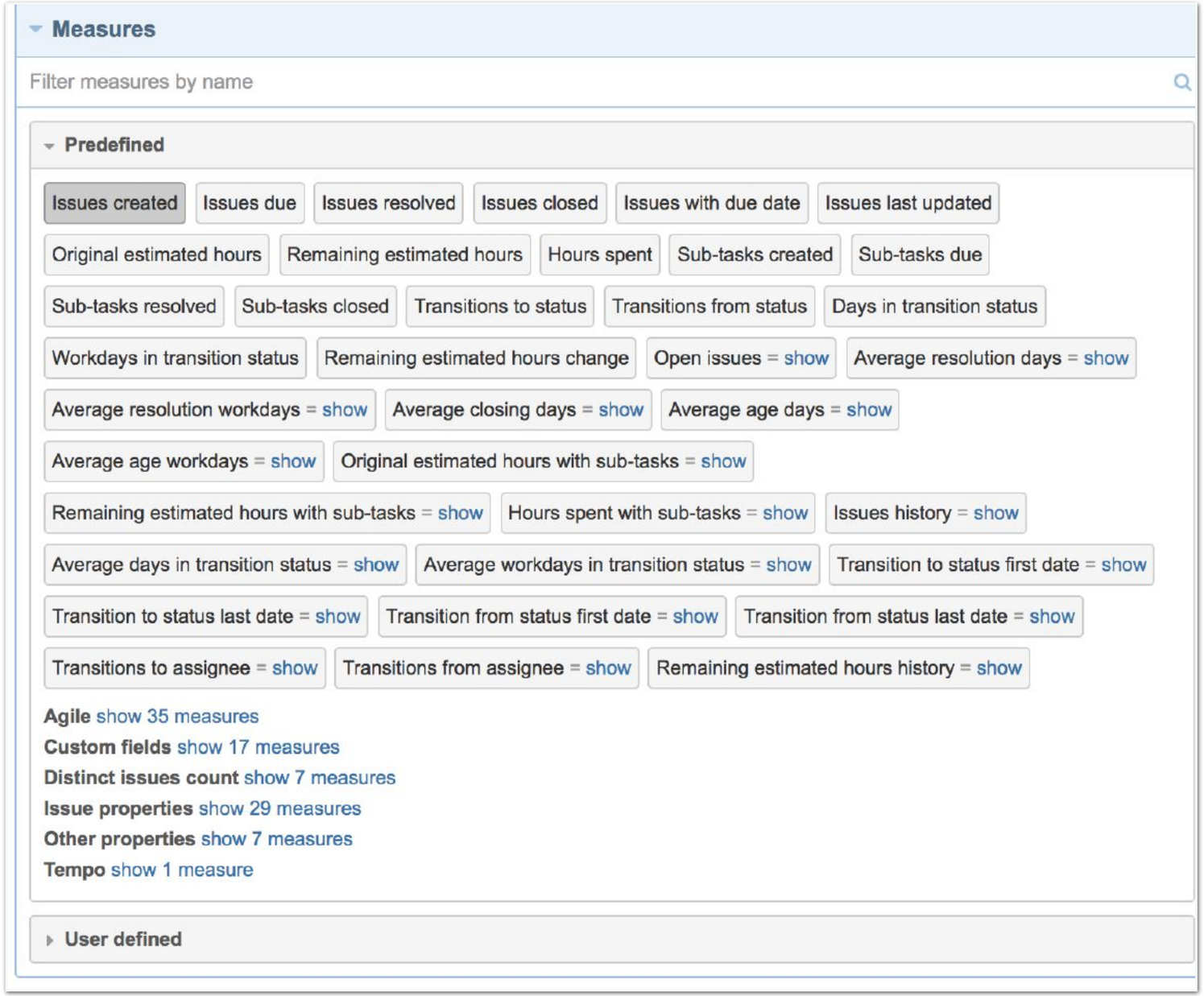
# Measures & dimensions

## Building blocks

Behavior of measures

Naming patterns

# Measures



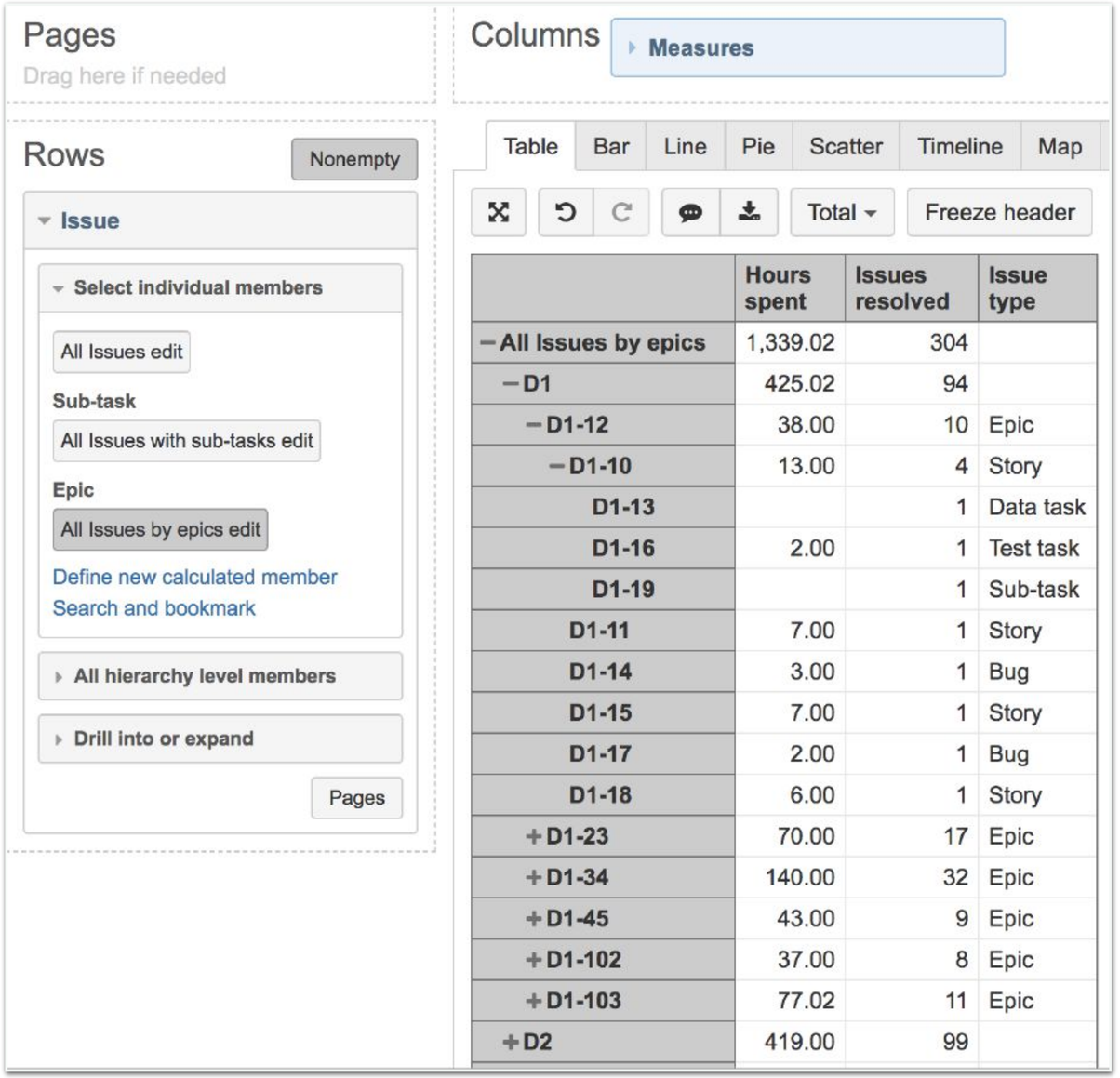
# Measures & dimensions

## Building blocks

Behavior of measures

Naming patterns

# Dimensions and their hierarchies




| | Hours spent | Issues resolved | Issue type |
|---|---|---|---|
| − All Issues by epics | 1,339.02 | 304 | |
| − D1 | 425.02 | 94 | |
| − D1-12 | 38.00 | 10 | Epic |
| − D1-10 | 13.00 | 4 | Story |
| D1-13 | | 1 | Data task |
| D1-16 | 2.00 | 1 | Test task |
| D1-19 | | 1 | Sub-task |
| D1-11 | 7.00 | 1 | Story |
| D1-14 | 3.00 | 1 | Bug |
| D1-15 | 7.00 | 1 | Story |
| D1-17 | 2.00 | 1 | Bug |
| D1-18 | 6.00 | 1 | Story |
| + D1-23 | 70.00 | 17 | Epic |
| + D1-34 | 140.00 | 32 | Epic |
| + D1-45 | 43.00 | 9 | Epic |
| + D1-102 | 37.00 | 8 | Epic |
| + D1-103 | 77.02 | 11 | Epic |
| + D2 | 419.00 | 99 | |

# Measures & dimensions

Building blocks

**Behavior of measures**

Naming patterns

# Measures & dimensions

Building blocks

**Behavior of measures**

Naming patterns

- There are **measures** and **properties**

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Building blocks

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- There are **actual** and **changelog** (historical) measures and dimensions

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- There are **measures** and **properties**
- Used with **Time dimension**, measures are counted by a specific issue date
- There are **actual** and **changelog** (historical) measures and dimensions
- Some measures work with specific dimensions only. **Be aware** with Sprint scope, test management, Insight dimensions and measures

# Measures & dimensions

Building blocks

**Behavior of measures**

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- There are **measures** and **properties**
- Used with **Time dimension**, measures are counted by a specific issue date
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- Some measures work with specific dimensions only. **Be aware** with Sprint scope, test management, Insight dimensions and measures

**Measures in calculations would behave similarly as in reports!**

# Measures and properties

Story ▾ | DEMO 003 ▾ | To Do ▾ | Sep 2017 ▾

| | Issues created | Issue status | Issue created date | Issue resolution date | Issue Planned analyze days | Planned analyze days created |
|---|---|---|---|---|---|---|
| **− D3** | **6** | | | | | **6.50** |
| **D3-100** | 1 | To Do | Sep 02 2017 | | 3.00 | 3.00 |
| **D3-14** | | Done | Mar 31 2017 | Apr 24 2017 | 2.00 | |
| **D3-112** | 1 | To Do | Sep 20 2017 | | 2.00 | 2.00 |
| **D3-122** | | To Do | Oct 06 2017 | | 2.00 | |
| **D3-125** | | To Do | Oct 11 2017 | | 2.00 | |

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# Measures with Time

D3-100 Experimenters Frankfurt's reimbursement examiners ...

| | Issues created | Planned analyze days created | Planned analyze days history | Planned analyze days change | Issues due |
|---|---|---|---|---|---|
| **Sep 02 2017** | 1 | 3.00 | | | |
| **Oct 09 2018** | | | 2.00 | 2.00 | |
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| **Nov 21 2018** | | | 3.00 | -1.00 | |

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# Measures & dimensions

Building blocks

Behavior of measures

**Naming patterns**

**Measure name** could help to:

# Measures & dimensions

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- distinct **actual** values from **historical** values

# Measures & dimensions

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  *Story Points **created*** vs *Story Points **history***

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  *Story Points **created*** vs ***Issue** Story Points*

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  *Story Points **created*** vs *Story Points **history***

- understand what **issue date** would be used to group issues on timeline

# Measures & dimensions

Building blocks

Behavior of measures

**Naming patterns**

**Measure name** could help to:

- distinct **measures** from **properties**

  *Story Points **created*** vs ***Issue** Story Points*

- distinct **actual** values from **historical** values

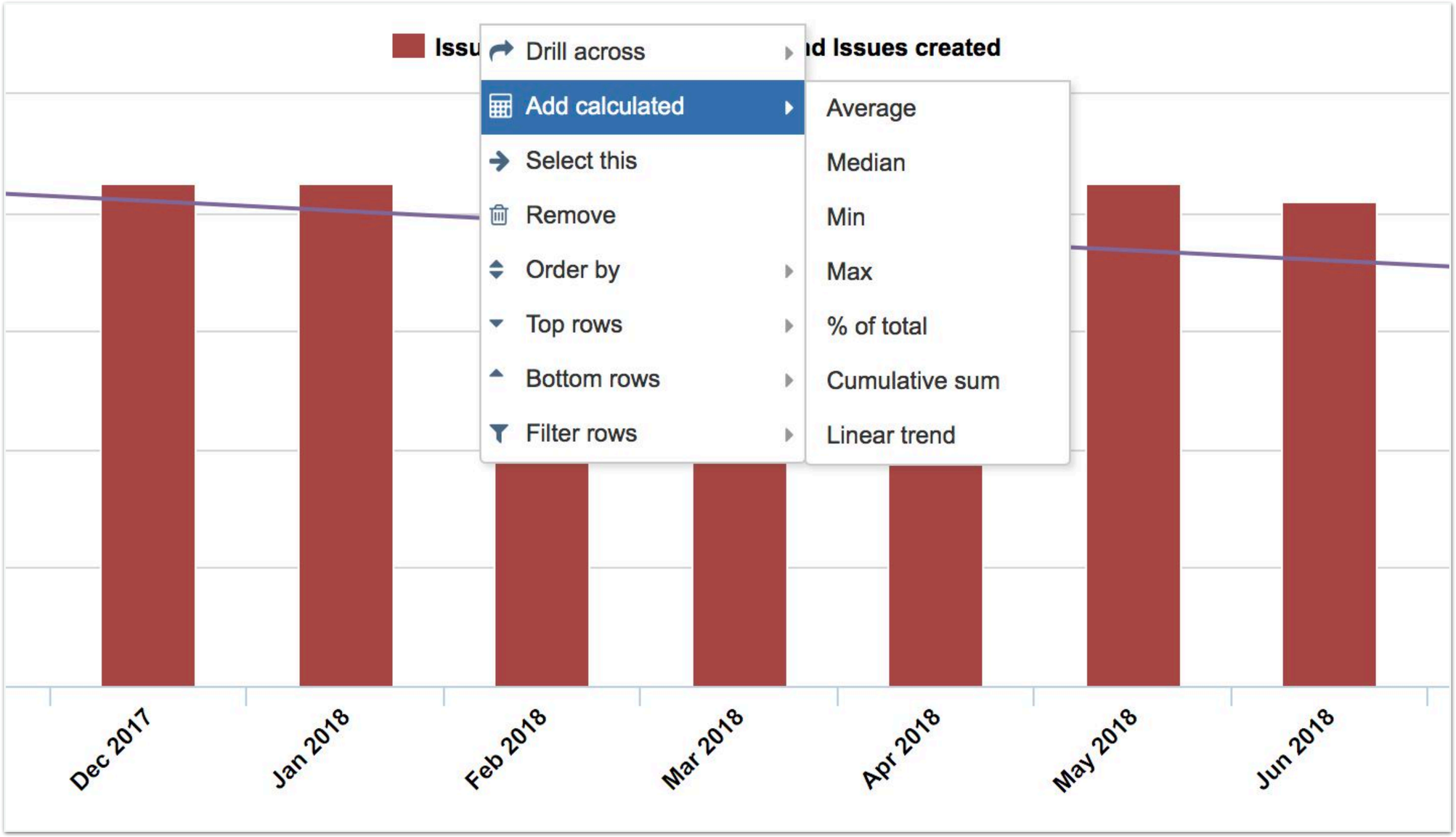
  *Story Points **created*** vs *Story Points **history***

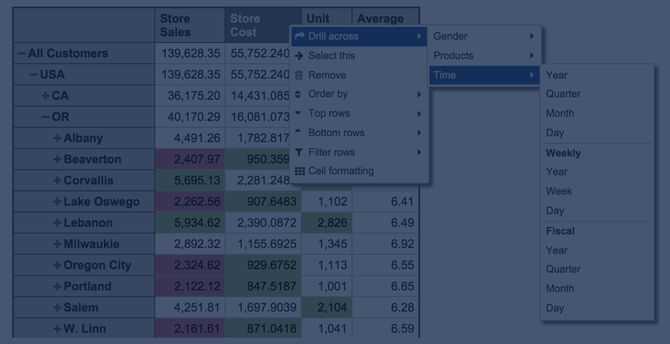
- understand what **issue date** would be used to group issues on timeline

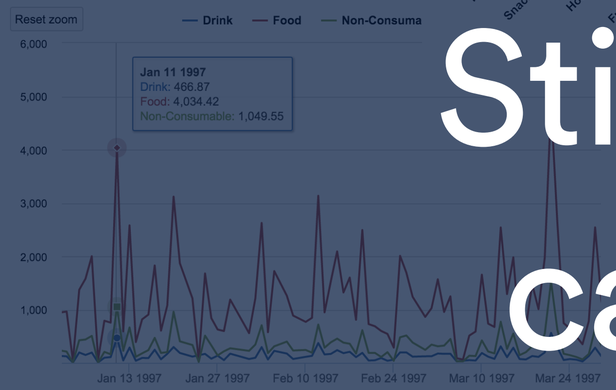
  *Story Points **resolved** vs Story Points **with End date***

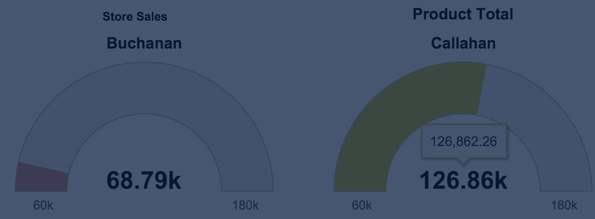
Have you tried using
eazyBI standard
features yet?

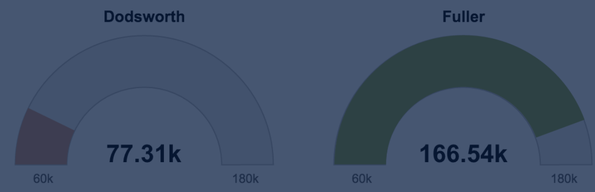
# Sneak peak of eazyBI 5.0.

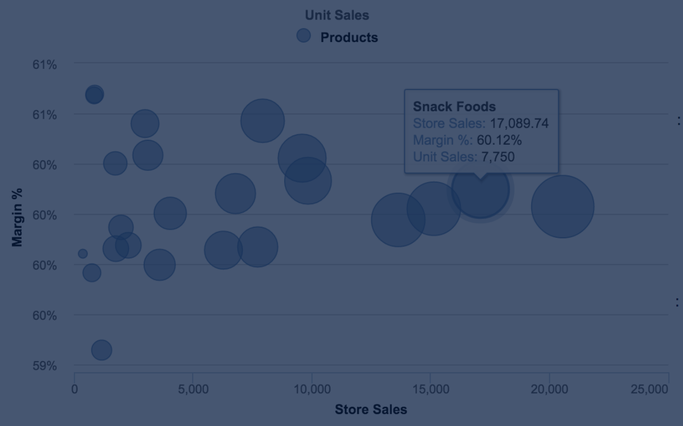


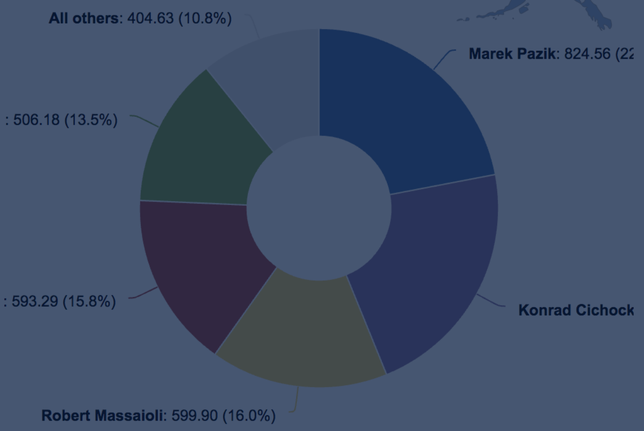


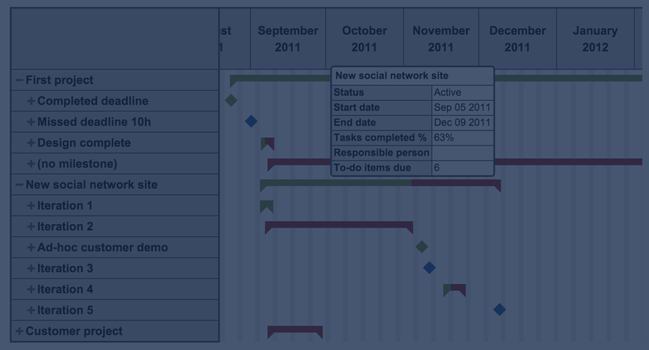





# Still need to do calculations?

PUT IT TOGETHER

# Know syntax, use correct data types, and combine carefully

# Put it together

Functions

Data type

Overview

## Syntax

```
Sum( Set_Expression , Numeric_Expression )
```

## Arguments

| | |
|---|---|
| **`Set_Expression`** | MDX expression that returns a set. |
| **`Numeric_Expression`** | MDX expression that returns a number. |

# Put it together

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- Follow the **syntax**!

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- Use correct **data (expression) type** for function arguments

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- Know the **output** of the function

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Functions

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- Follow the **syntax**!
- Use correct **data (expression) type** for function arguments
- Know the **output** of the function
- **Use brackets, curly brackets, . (dots), commas** as prescribed

# Put it together

Functions

Data type

Overview

# Put it together

Functions

Data type

Overview

- Member expression

# Put it together

Functions

Data type

Overview

- **Member expression**

```
[Time].CurrentMember
```

# Put it together

Functions

Data type

Overview

- **Member expression**

```
[Time].CurrentMember
```

- **Date expression**

# Put it together

Functions

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- **Member expression**

```
[Time].CurrentMember
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- **Date expression**

```
[Time].CurrentMember.StartDate
```

# Put it together

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- **Date expression**

```
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```

- **String expression**

# Put it together

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Overview

- **Member expression**

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```

- **Date expression**

```
[Time].CurrentMember.StartDate
```

- **String expression**

```
[Time].CurrentMember.Name
```

# Put it together

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Overview

- **Member expression**

```
[Time].CurrentMember
```

- **Date expression**

```
[Time].CurrentMember.StartDate
```

- **String expression**

```
[Time].CurrentMember.Name
```

- **Numeric expression**

# Put it together

Functions

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Overview

- **Member expression**

```
[Time].CurrentMember
```

- **Date expression**

```
[Time].CurrentMember.StartDate
```

- **String expression**

```
[Time].CurrentMember.Name
```

- **Numeric expression**

```
DateDiffDays(
 [Time].CurrentMember.StartDate,
 [Time].CurrentMember.NextStartDate)
```

# Put it together

Functions

Data type

Overview

| | Member | Date | String | Numeric |
|---|---|---|---|---|
| +2017 | {[Time].[2017]} | Jan 01 2017 | 2017 | 365 |
| +2018 | {[Time].[2018]} | Jan 01 2018 | 2018 | 365 |
| +2019 | {[Time].[2019]} | Jan 01 2019 | 2019 | 365 |

# Examples of expression types

| Member | Set | Date | Numerical |
|---|---|---|---|
| [Status].[Done]<br><br>[Time].CurrentHierarchyMember<br><br>[Time].[Day].<br>CurrentDateMember.<br>PrevMember<br><br>Aggregate(<br>{[Status].[Done],<br>[Status].[Closed],<br>[Status].[Accepted]})<br><br>Order(<br>[Sprint].[Sprint].Members,<br>[Sprint].CurrentMember.('Start date')).Item(0) | Any single member<br>[Status].CurrentMember<br><br>{[Status].[Done],<br>[Status].[Closed],<br>[Status].[Accepted]}<br><br>[Status].[Status].Members,<br><br>[Time].<br>[Year].CurrentDateMember.<br>Children<br><br>Filter([Status].[Status].Member,<br>[Status].CurrentMember.Name<br>matches "D*") | DateParse('2018-11-20')<br><br>[Time].[Day].<br>CurrentDateMember.StartDate<br><br>[Measures].[Issues resolution date]<br><br>[Issue].CurrentMembet.<br>getDate('Resolved at') | 1+1<br><br>Any quantitative measure<br><br>([Measures].[Issues created],<br>[Status].[In Progress])<br><br>[Measures].[Issues resolved] +<br>[Measures].[Issues due]<br><br>[Issue].CurrentMember.get('Story Points')<br><br>DateDiffDays(<br>[Measures].[Issue creation date],<br>[Measures].[Issue resolution date]) |

# Put it together

Functions

Data type

**Overview**

# Put it together

Functions

Data type

**Overview**

- Use only **existing** measures, dimension members, and functions to create the new measure

# Put it together

Functions

Data type

**Overview**

- Use only **existing** measures, dimension members, and functions to create the new measure
- Remember **basic mathematics**

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- Get familiar with most popular **MDX functions and data types**

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- Trust **AutoComplete**!

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- Use measure **examples** from demo account and example reports with **understanding**!

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- Remember **basic mathematics**
- Get familiar with most popular **MDX functions and data types**
- Trust **AutoComplete**!
- **Start simple** and add complexity gradually
- Use measure **examples** from demo account and example reports with **understanding**!
- **Test** each part of the calculation

date diff days = edit

**Agile** show 1 measure
**Epic burn-down** show 7 measures
**Predicted** show 5 measures
**Predicted by issues** show 5 measures
**Prediction by epic** show 4 measures

Define new caclulated measure

Table | Bar | Line | Pie | Scatter | Timeline | Map | Gantt | Gauge

Hide empty | Total | Freeze header

2017

| | Issues resolved |
|---|---|
| + Mar 2017 | 12 |
| + Apr 2017 | 45 |
| + May 2017 | 34 |
| + Jun 2017 | 36 |
| + Jul 2017 | 42 |
| + Aug 2017 | 42 |
| + Sep 2017 | 46 |
| + Oct 2017 | 26 |
| + Nov 2017 | 5 |
| + Dec 2017 | |

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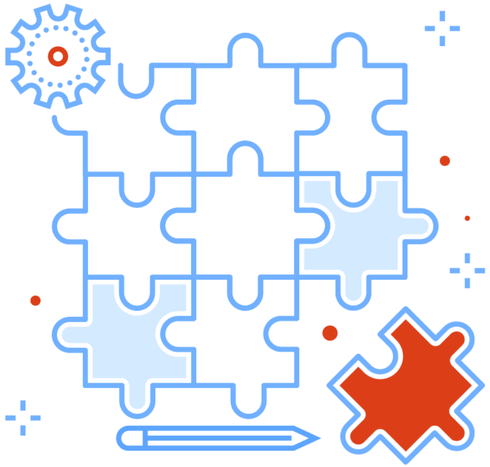
# RECAP

Concept

Measures & Dimensions



Functions

Try, fail, try again,
and be kind.
To yourself.

# Questions?

community.eazybi.com

support@eazybi.com

# Thank you!