



# Behind complex filters

Daina Tupule



I like to find  
solutions

**Daina Tupule**



**Community Days**  
**April 3, 2020**

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**Let's start easy**

**Enablers on  
complex cases in  
eazyBI**

**Use cases**

**eazyBI** is a  
**business intelligence tool**  
for data analysis and visualisation  
with built-in Jira data import

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**Make reporting easy, hard  
scenarios possible**

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**Make reporting easy**

DEMO Alfa ▾

Story ▾

Status: All ▾

Assignee: All ▾

Contains text

More ▾

Search

Pages

> Project

> Issue Type

> Status

> Assignee

Columns

> Measures

Table

Bar

Line

Pie

Scatter

Timeline

Map

Gantt

Gauge



Total ▾

Freeze header



DEMO Alfa ▾

Story ▾

All Statuses ▾

All Assignees ▾

Rows

Nonempty

Issue

> Select individual members

> All hierarchy level members

Select all members at level

Project 4

Issue 597

Sub-task

Project 4

Parent 449

Sub-task 598

Epic

Project 4

Epic 32

Parent 463

Issue	Issues created	Original estimated hours	Hours spent	Issue created date	Issue resolution date	Issue due date	Issue assignee	Issue type	Issue priority	Issue status
DA-1 Delacroix's malices costliness resurface maharajah brusqueness apportionment vividness colanders integrating	1	8.00	7.00	Jan 02 2019	Jan 31 2019	Mar 27 2019	David Sand	Story	Low	Done
DA-10 Flower fan's phloxes playroom's wormiest ridiculed bashfulness greensward	1	12.00	11.00	Jan 18 2019	Feb 22 2019	Feb 22 2019	Duncan Snow	Story	Medium	Done
DA-104 Customer selected new team for their project	1	8.00	10.00	Jul 02 2019	Oct 15 2019	Nov 19 2019	Duncan Snow	Story	Medium	Done
DA-108 Sunbather skullcaps infestation risen lass education's knacker's Camry	1	8.00	8.00	Jul 09 2019	Sep 02 2019	Sep 26 2019	Sandra Adams	Story	Lowest	Done
DA-11 Madlv bulking	1	6.00	7.00	Jan 20 2019	Feb 11 2019	Feb 15 2019	Sandra	Story	Low	Done

DEMO Alfa ▾

Story ▾

Status: All ▾

Assignee: All ▾

Contains text

More ▾

Search

Pages

> Project

> Issue Type

> Status

> Assignee

Rows

Nonempty

> Issue

Columns

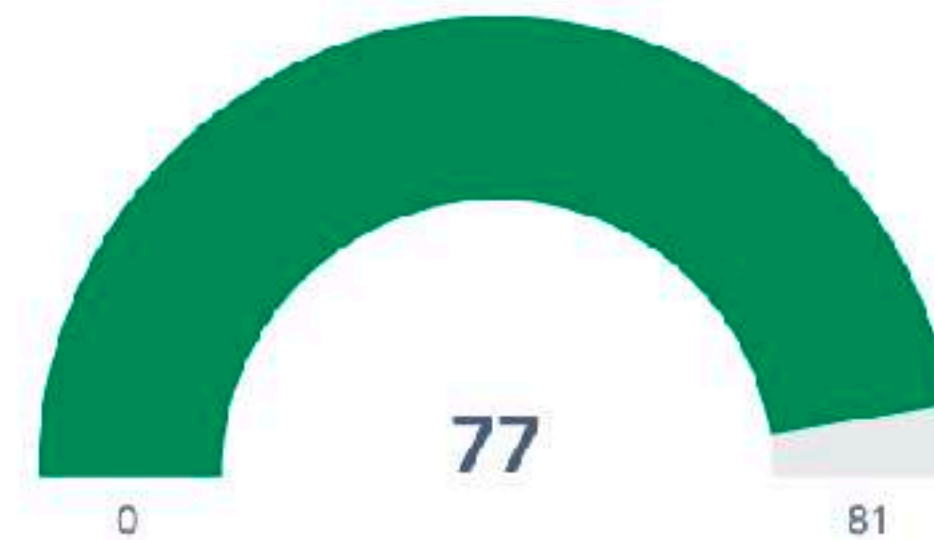
> Measures

Table Bar Line Pie Scatter Timeline Map Gantt Gauge

🗘 ↺ ↻ 🗨️ ⬇️ Total ▾ Only values Swap axes Font size ▾

DEMO Alfa ▾ Story ▾ All Statuses ▾ All Assignees ▾

Issues resolved





DEMO Alfa ▾

Story ▾

Status: All ▾

Assignee: All ▾

Contains text

More ▾

Search

Pages

> Project

> Issue Type

> Assignee

Rows

Nonempty

> Fix Version

Columns

> Measures

> Status

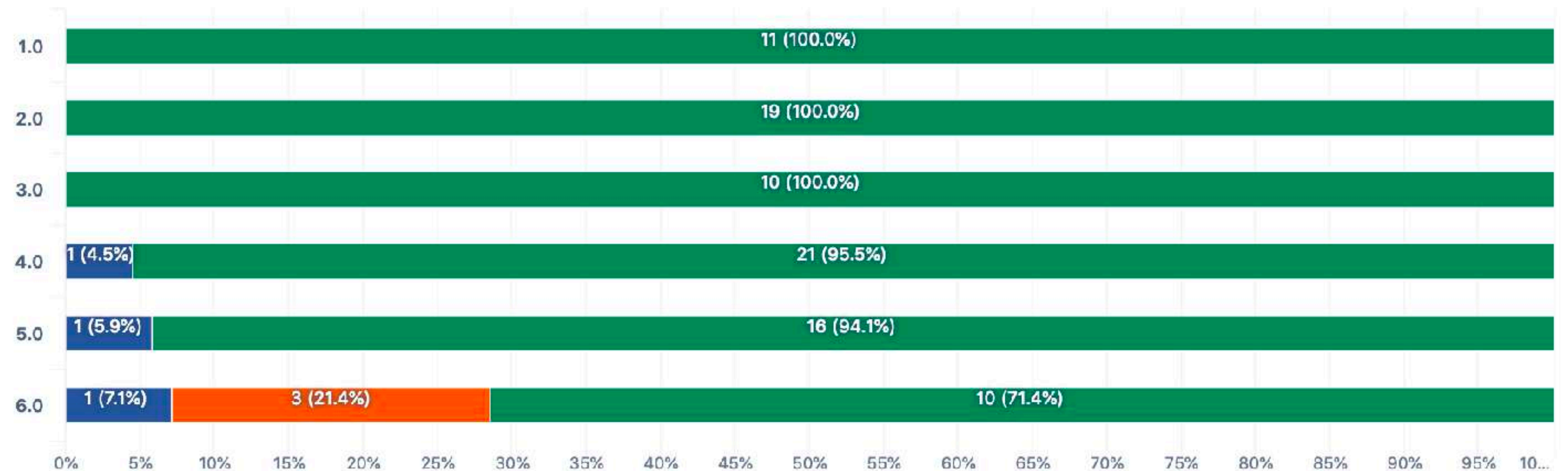
Table Bar Line Pie Scatter Timeline Map Gantt Gauge

✕ ↺ ↻ 🗨️ ⬇️ Total ▾ Stacked Vertical Values Percentage Data labels ▾ Axes options ▾ Font size ▾

DEMO Alfa ▾ Story ▾ All Assignees ▾

Issues created

■ To Do ■ In Progress ■ Done



DEMO Alfa ▾

Story ▾

Status: All ▾

Assignee: All ▾

Contains text

More ▾

Search

Pages

> Project

> Issue Type

> Status

> Assignee

Rows

Nonempty

> Time

Columns

> Measures

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



Time ≤ today

All others

Total ▾

Stacked

Vertical

Data labels

Axes options ▾

Font size ▾



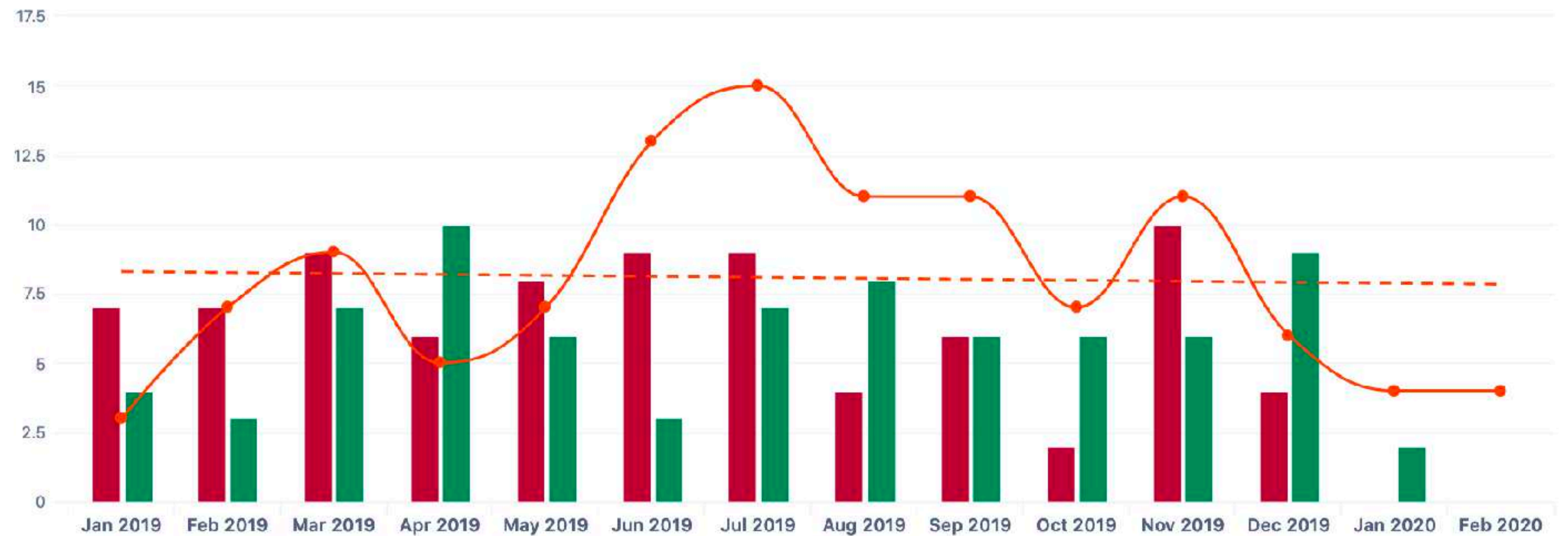
DEMO Alfa ▾

Story ▾

All Statuses ▾

All Assignees ▾

■ Issues created ■ Issues resolved ● Open issues - - Linear trend Open issues



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**Hard scenarios possible**

# Jira JQL queries

✓ status != Declined



**Search**

✓ component = Development or labels = Development



**Search**

✓ duedate is not EMPTY AND assignee was in membersOf(jira-developers)



**Search**

# Hard scenarios main enablers



## MDX

MDX calculations during report run



## JavaScript custom fields

Use JavaScript to calculate data during import

# Hard scenarios possible

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## MDX

JavaScript  
custom fields

### **MDX calculations**

Will cover most scenarios and effectively uses imported data. Could get complex and impact performance

### **Calculated members**

Aggregates in **dimensions** - groups dimension members for easier usage in reports

### **Calculated measures**

Calculations in **Measures** - percentages, comparisons, custom metrics, KPI, OKR, etc.

# Hard scenarios possible

## MDX

JavaScript  
custom fields

## Calculated members

Use members and member properties of the dimension only. Avoid calculations (+, -, /). While they might work, they could lead to inconsistent results and performance problems

Define calculated member formula

[Sprint].[ Active sprints ] =

```
1 Aggregate(  
2   Filter(  
3     [Sprint].[Sprint].Members,  
4     NOT [Sprint].CurrentMember.getBoolea('Closed')  
5     AND  
6     -- NOT isEmpty([Sprint].CurrentMember.get('Start date'))  
7     NOT isEmpty([Measures].[Sprint start date])  
8   )  
9 )
```

Formatting default



Do not use the other dimension **Measures** when defining a calculated member in **Sprint**. Create complex calculations in **Measures**.

Root members

All Sprints

Calculated members

All closed sprints Open sprints

Last closed sprints rank

Last 6 D1 sprints Sprint -1

Sprint -2 Sprint -3 Sprints 14

Last closed sprints

5 last closed sprints

Last closed sprints 2nd cycle

Last closed sprints 3rd cycle

Active sprints

Ignore warnings and update

Delete cancel

Hard  
scenarios  
possible

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MDX

JavaScript  
custom fields

## Calculated JavaScript custom field

Defines a new field (measure, dimension) in **eazyBI advanced settings**. Uses JavaScript to calculate values for the field

```
[jira.customfield_NNNNN]  
name = "NNNNN name"  
data_type = "string"  
dimension = true  
javascript_code = '''  
    // JavaScript code goes here  
    '''
```



# Hard scenarios possible

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MDX

JavaScript custom fields

## JavaScript

eazyBI uses basic JavaScript with <https://underscorejs.org/> library. We support `strftime` function and modification for `Date.parse` function for parsing date time string in ISO8601 format as well.

## Jira issue data structure

eazyBI imports data based on Jira issues. You can access any imported fields via JavaScript.

# Hard scenarios possible

MDX

JavaScript custom fields

```
1 projectname issue.fields.project.name;  
2 console.log(projectname);
```

## Test your JavaScript in Custom Javascript code in import options

**Delete it when testing is done!**

```
... apporportionment vividness colanders integrating",  
- "project": {  
  "id": 10201,  
  "type": "DA",  
  "name": "DEMO Alfa",  
  "description": ""  
},  
  "components": [...], // 1 item  
  "issuetype": {...}, // 3 items  
  "fixVersions": [...], // 1 item  
  "versions": [],  
  "reporter": {...}, // 5 items  
  "assignee": {...}, // 5 items  
  "priority": {...}, // 2 items  
  "status": {...}, // 3 items  
  "resolution": {...}, // 2 items  
  "security": null,
```

## eazyBI settings

General License Additional Advanced settings

### Advanced settings

Please see the advanced settings help page.

```
9
10 #example 2
11 [jira.customfield_dev_sup]
12 name = "Dev vs Sup"
13 data_type = "string"
14 dimension = true
15 javascript_code = '''
16 var isDev = false;
17 if (issue.fields.labels.indexOf("Development") > -1 ) {
18   isDev = true
19 }
20 else {
21   for (var i=0; i < issue.fields.components.length; i++) {
22     if (issue.fields.components[i].name == "Development") {
23       isDev = true;
24       break;
25     }
26   }
27 }
28 issue.fields.customfield_dev_sup = (isDev == true ) ? "Development" : "Support"
29 '''
30
31 # example 3
32 [jira.customfield_wasindevwithduedate]
33 name = "JavaScript"
34 data_type = "integer"
35 measure = true
36 multiple_dimensions = ["Time","Assignee"]
37 javascript_code = '''
38 if (issue.fields.duedate) {
39   var assigneeInDev = ['dsand','dsnow'];
40   var noAssigneeChange = true;
41   var assigneeHistory = [];
42   var assigneeSet = issue.fields.created;
43   if (issue.changelog && issue.changelog.histories && issue.changelog.histories.length > 0
44     var histories = issue.changelog.histories;
```

Hard  
scenarios  
possible

MDX

JavaScript  
custom fields

# Hard scenarios possible

MDX

## JavaScript custom fields

### Jira import options

General Add-ons Custom fields Additional options

#### Custom fields

After projects selection, you can select available custom fields which you would like to import. Read more about custom fields import in the [Jira custom fields documentation](#).

Custom field	Import as dimension	Import as measure	Import as property	Import value changes
Issue links show				
Other hide				
Dev vs Sup	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Valid	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
JavaScript		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

**Import** or Save or back

Click **Import** to start the import right now. Click **Save** to change the options for the next regular import.



# Use cases

```
Aggregate(  
  Except(  
    [Status].[Status].Members,  
    [Status].[Declined])  
)
```

**MDX**

## One dimension

**Calculated member** in respective dimension with function **Aggregate** and some filtering options

## Limitations

Function **Except** might not work as expected in multiple value dimensions, for example, Labels

## Performance risks

Any **multiple** selection or calculated member with multiple members on **Pages** multiplies calculations

✓ status != Declined



Search

```
Aggregate(  
  Except(  
    [Status].[Status].Members,  
    [Status].[Declined])  
)
```

```
issue.fields.customfield_valid =  
(issue.fields.status.name ==  
"Declined") ? "No" : "Yes"
```

**MDX**

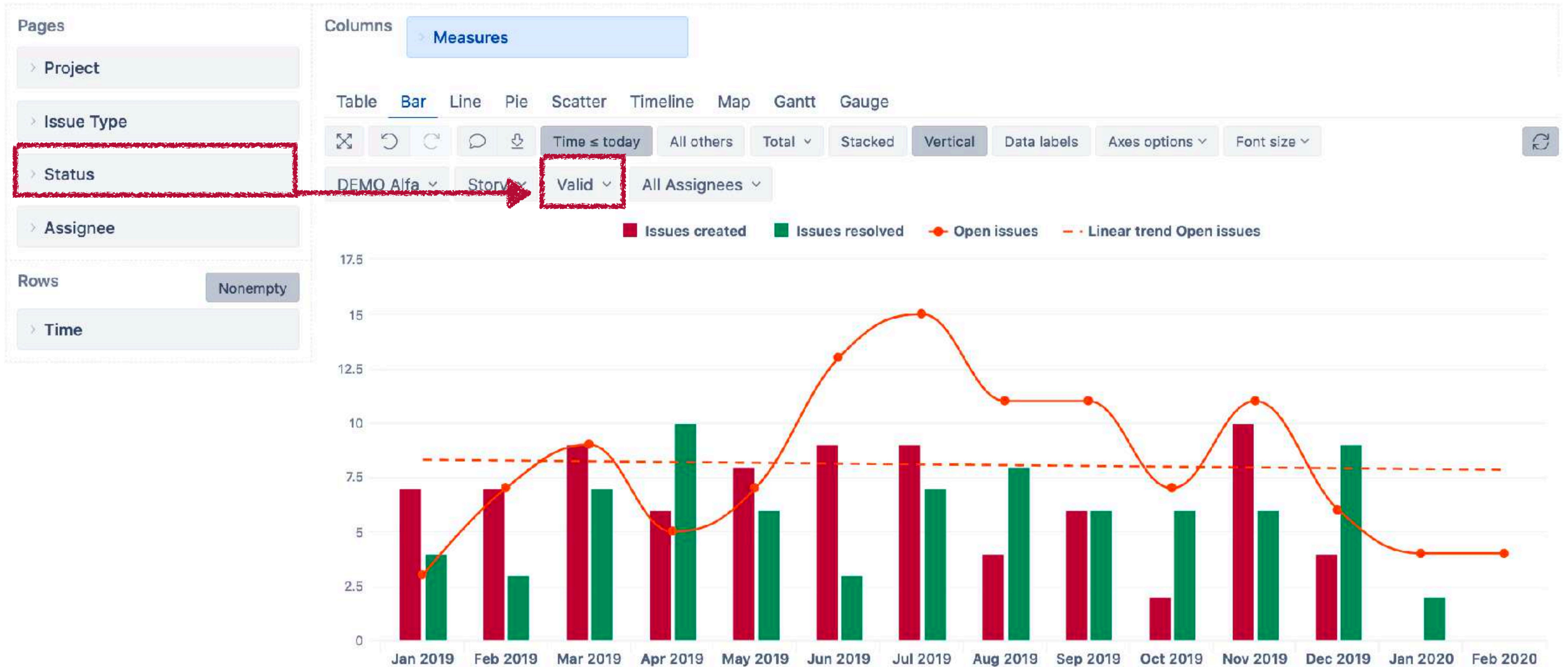
**JavaScript**

status != Declined



Search

# Report with MDX



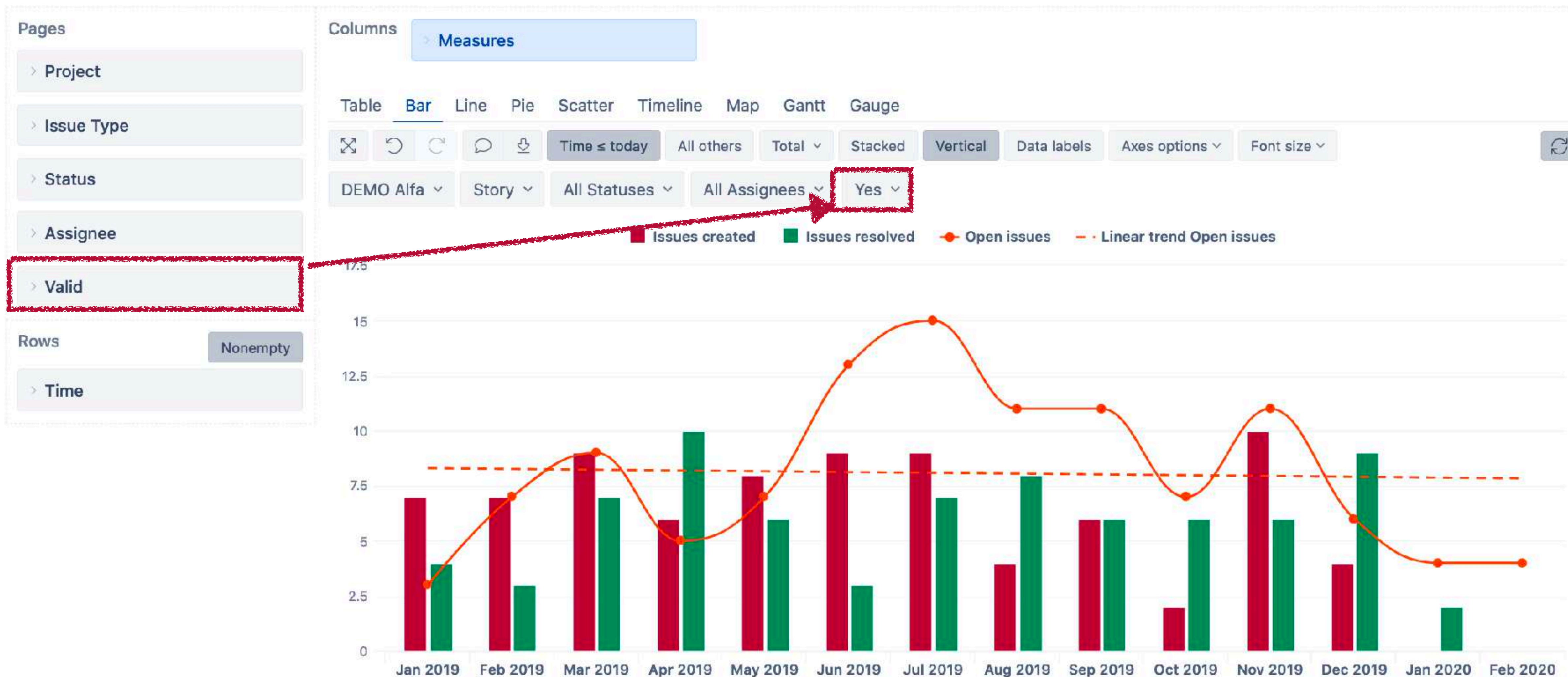


status != Declined



Search

# Report with JavaScript custom field



✓ component = Development or labels = Development



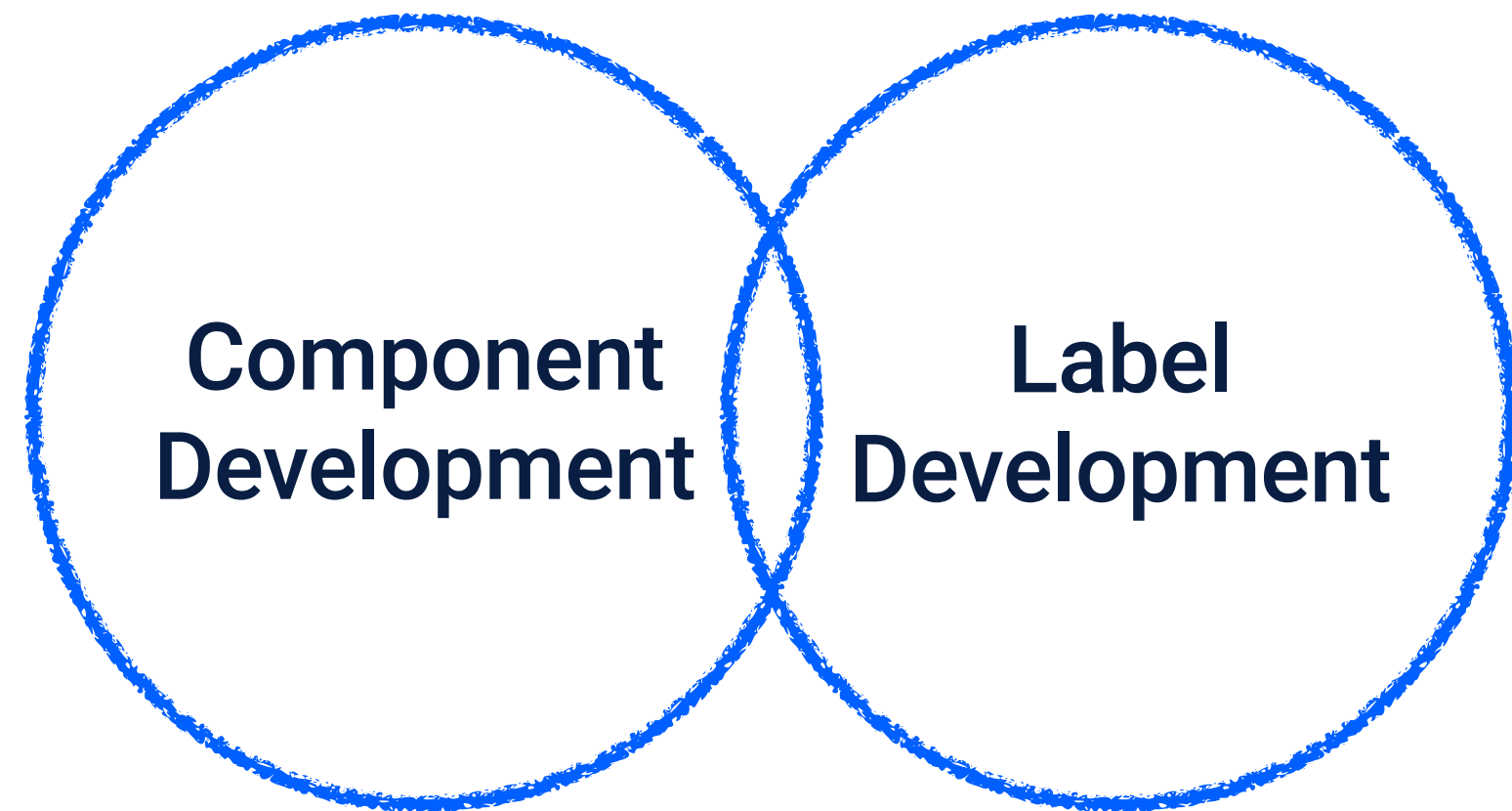
Search

```
([Measures].[Issues created],  
 [Project].[DEMO Alfa].[Development])  
+  
([Measures].[Issues created],  
 [Label].[Development])  
-  
([Measures].[Issues created],  
 [Project].[DEMO Alfa].[Development])  
 [Label].[Development])
```

## Several dimensions with OR filter

OR filter for dimension selections is not supported, calculated measure is required

Consider arithmetical calculations



**MDX**

✓ component = Development or labels = Development



Search

```
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues created]
)
+
([Measures].[Issues created],
 [Label].[Development])
-
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues created],
  [Label].[Development])
))
```

**MDX**

## Several dimensions with OR filter

OR filter for dimension selections is not supported, calculated measure is required

Consider arithmetical calculations

Consider filtering (**by projects**)

✓ component = Development or labels = Development



Search

```
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues created]
)
+
([Measures].[Issues created],
 [Label].[Development])
-
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues created],
  [Label].[Development])
))
```

**MDX**

## Several dimensions with OR filter

OR filter for dimension selections is not supported, calculated measure is required

Consider arithmetical calculations

Consider filtering (**by projects**)

Create calculation for each measure

✓ component = Development or labels = Development



Search

```
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues resolved]
)
+
([Measures].[Issues resolved],
[Label].[Development])
-
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues resolved],
  [Label].[Development])
))
```

**MDX**

## Several dimensions with OR filter

OR filter for dimension selections is not supported, calculated measure is required

Consider arithmetical calculations

Consider filtering (**by projects**)

Create calculation for each measure

✓ component = Development or labels = Development



Search

```
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues created]
)
+
([Measures].[Issues created],
 [Label].[Development])
-
SUM(
  Filter(
    Descendants([Project].CurrentMember,[Project].
[Component]),
    [Project].CurrentMember.Name = "Development"),
  [Measures].[Issues created],
  [Label].[Development])
))
```

**MDX**

```
var isDev = false;
if (issue.fields.labels.indexOf("Development") > -1 )
{
  isDev = true
}
else {
  for (var i=0; i < issue.fields.components.length;
i++) {
    if (issue.fields.components[i].name ==
"Development") {
      isDev = true;
      break;
    }
  }
}
issue.fields.customfield_dev_sup = (isDev == true ) ?
"Development" : "Support" ''
```

**JavaScript**

✓ component = Development or labels = Development



Search

# Report with MDX

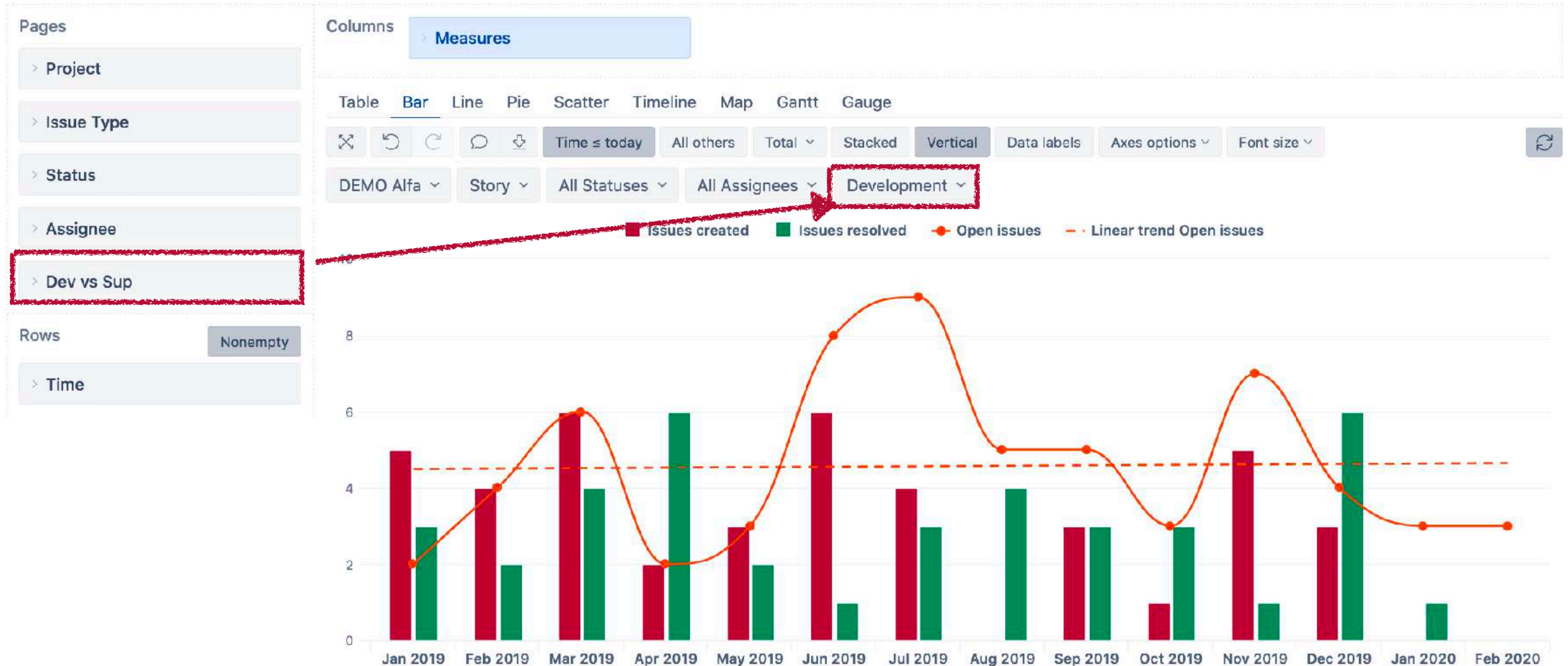


✓ component = Development or labels = Development



Search

# Report with JavaScript custom field







duedate is not EMPTY AND assignee was in membersOf(jira-developers)



Search

```
SUM(  
  Filter(  
    Descendants([Issue].CurrentMember,[Issue].[Issue]),  
    NOT IsEmpty([Measures].[Issue due date])  
  ),  
  ([Measures].[Transitions to issues count],  
  [Assignee Group].[jira-developers])  
)
```

## Several dates or activities

If there are at least two facts based on issue dates (date custom fields and measures) **calculated measure** on issue level is required

Due date is not EMPTY  
Assignee was in a specific group

**MDX**



duedate is not EMPTY AND assignee was in membersOf(jira-developers)



Search

```
SUM(
  Filter(
    Descendants([Issue].CurrentMember,[Issue].[Issue]),
    NOT IsEmpty([Measures].[Issue due date])
  ),
  ([Measures].[Transitions to issues count],
  [Assignee Group].[jira-developers])
)
```

```
if (issue.fields.duedate) {
  var assigneeInDev = ['dsand','dsnow'];
  var noAssigneeChange = true;
  var assigneeHistory = [];
  var assigneeSet = issue.fields.created;
  if (issue.changelog && issue.changelog.histories &&
issue.changelog.histories.length > 0) {
    var histories = issue.changelog.histories;
    for (var i = 0; i < histories.length; i++) {
      var history = histories[i];
      if (history.items && history.items.length > 0) {
        for (var n = 0; n < history.items.length; n++) {
          var item = history.items[n];
          if (item.field == 'assignee' ){
            if(noAssigneeChange && assigneeInDev.indexOf(item.from) > -1 ) {
              assigneeHistory.push(assigneeSet.toString().substr(0,10) + "," +
item.from + ",1" );
            }
            if (assigneeInDev.indexOf(item.to) >-1) {
              assigneeHistory.push(assigneeSet.toString().substr(0,10) + "," +
item.to + ",1" ) ;
            }
            noAssigneeChange = false;
          }
        }
      }
    }
  }
  if(noAssigneeChange ) {
    if (issue.fields.assignee &&
assigneeInDev.indexOf(issue.fields.assignee.name) > -1) {
      assigneeHistory.push(assigneeSet.toString().substr(0,10) + "," +
issue.fields.assignee.name + ",1" );
    }
  }
  issue.fields.customfield_wasindevwithduedate = assigneeHistory.join("\n");
}
```

**MDX**

**JavaScript**

✓ duedate is not EMPTY AND assignee was in membersOf(jira-developers)



Search

# Report with custom measure

## Pages

> Project

> Issue Type

> Status

## Rows

Nonempty

> Assignee

## Columns

> Measures

Table

Bar

Line

Pie

Scatter

Timeline

Map

Gantt



Hide empty rows ▾

Total ▾

DEMO Alfa ▾

Story ▾

All Statuses ▾

	MDX	JavaScript
David Sand	29	29
Duncan Snow	20	23



duedate is not EMPTY AND assignee was in membersOf(jira-developers)



Search

# Report with custom measure

DEMO Alfa

Story

All Statuses

Duncan Snow

	MDX	JavaScript
DA-10 Flower fan's phloxes playroom's wormiest ridiculed bashfulness greensward	1	1
DA-104 Customer selected new team for their project	1	1
DA-113 Specifying Rodgers peerage bronchi's Amaterasu Calderon's bushier campanile's mistreating leprechaun	1	1
DA-118 Frustrate Salinger's tones ledgers factotums	1	2
DA-131 Quadruplicated Iroquoian prosecutes soaps defaced mellifluously gridirons jambs potful's	1	1
DA-138 Razed sacred pinball homily's Bimini's	1	1
DA-139 Dulled fattier timbers catalyst's intricacy inaugurates or nougat	1	1
DA-155 Henry titmice chalky leapfrogging vicuña	1	1
DA-161 Johns testifies chronological Fukuoka's Herodotus's crackliest chorussing teamwork Capella's besetting	1	1
DA-170 Chinking Puritans implementation unluckier humaneness's intents	1	2
DA-176 Quills afternoons dustiness's wonderment warding scientists stickies	1	2
DA-180 Romes whosoever dismantles revolutionizing frizzed crescent kayaked	1	1
DA-194 Cobra's calculus gingkos satyrs protectors	1	1
DA-28 Ragas implantation Levi's clubfoot's diligent Derbies Leipzig's silkening	1	1
DA-3 Windburns irritates enjoying posits incident's used embroiders	1	1
DA-31 Henceforward swaggerer Cabral omnibus's Kuwaitis sacking's	1	1
DA-49 Schist's Brno refrigerator's obsolescent argon shies administrations	1	1
DA-51 Barrack yodel Dis unsympathetic destructively Dristan hiked oppression's	1	1
DA-78 Innocuously tokenism stifled cigarette's validly Fleming's denaturing maraca Mayans cocooned	1	1
DA-99 Adding perimeter's uniformed reprimand hypertension forfeiting scaling refinishes	1	1
<b>Total</b>	<b>20</b>	<b>23</b>

# MDX vs JavaScript



## MDX

Gives all the benefits of BI  
Might impact performance  
MDX could be hard to learn



## JavaScript custom fields

Common for eazyBI instance  
Calculations during import  
JavaScript knowledge is quite  
general



# Questions?

[community.eazybi.com](https://community.eazybi.com)  
[support@eazybi.com](mailto:support@eazybi.com)

An aerial view of a city at night, with a color gradient overlay transitioning from red on the left to blue on the right. The city lights are visible through the semi-transparent overlay.

**Thank you!**