Dashboard features with Kyubit Business Intelligence

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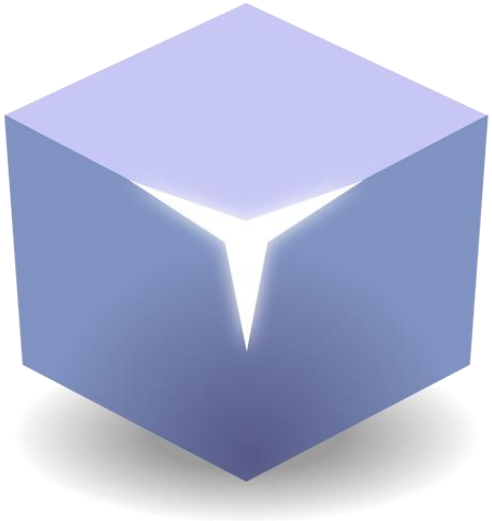

Dashboards - User Manual

Using dashboard features of Kyubit Business Intelligence (Release 4.0)

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Contents

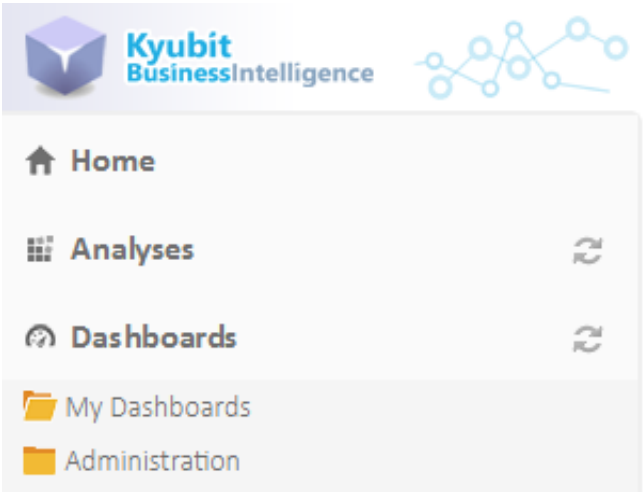
1. Dashboard features overview 5
2. Managing Data Sources 6
2.1. OLAP and SQL server data sources 6
2.2. Set up ODBC data source 7
2.3. Set Data Source permissions 8
3. Creating and designing dashboards 9
3.1. Dashboard area, tiles and columns ..... **Error! Bookmark not defined.**
3.2. Working with Tiles 11
3.2.1. Add tile to dashboard 11
3.2.2. Remove tile from dashboard 11
3.2.3. Rearrange tiles on dashboard 12
3.2.4. Configure tile to show visualization 13
3.3. Tile automatic data refresh 17
3.4. Open custom link in a context of dashboard data 18
3.5. Dashboard title, header and footer 19
3.6. Manage columns on dashboard 21
3.7. Saving Dashboard 21
3.8. Enter and exit 'Design' view for dashboard 22
3.9. URL to access dashboards 22
4. Configuring dashboard tiles 23
4.1. Data usage within tiles (Categories and series) 23
4.2. 'Analysis' data for dashboard tiles 23
4.3. 'Geo Maps' configuration and usage 26
4.4. 'Table' chart visualization 27
4.5. 'Line chart' custom 'Min Y' and 'Max Y' configuration 27
4.6. 'Bubble chart' specifics 28
4.7. 'Combo' chart 29
4.8. 'TreeMap' chart 30
4.9. Enlarged view on dashboard tile 34
4.10. 'MDX query' data for dashboard tiles 35
4.11. 'SQL Queries' data for dashboard tiles 36
5. Dashboard layout configuration options 37
5.1. Color theme pallet 37
5.2. Create Custom Color Pallet 38
5.3. Value Labels 40
5.4 Show only selected categories/series 41
5.5. Pivot Categories/Series 41

5.6. Show Trend/Average Lines 42
5.7. Legend display and position 42
5.8. Dashboard Tile Border 43
6. Working with KPIs 44
6.1. Designing KPI 45
6.2. Understanding data usage for KPI design 46
6.3. Setting permissions for KPI 46
6.4. KPI visualization 47
6.5. Gauge KPI visualization 47
6.6. Goal-Meter KPI visualization 48
7. Scorecards 49
8. Working with Queries 51
8.1. Creating query 51
8.2. Query values “Format string” 52
8.3. Impersonate query execution 54
8.5 Query caching 55
8.6 Setting Query permissions 56
9. Dashboard slicers and analysis within dashboard 57
9.1. OLAP Slicers 57
9.1.1. OLAP filters inheritance to child dashboards 58
9.2. SQL data filtering 59
9.2.1. Creating SQL queries with ‘Input Parameters’ 61
9.3. Exclude dashboard tile from filtering 63
9.4. Tiles drilldown, drill-through OLAP actions within dashboard 63
9.5 User Properties as Dashboard filters 64
9.5. Define dashboard filters using URL 65
9.6. Dashboard filters configuration 66
9.7. End-User actions on the dashboard 67
9.8. Use chart as ‘Slicer’ 68
10. Folders and dashboards access permissions 69
10.1. Setting object permissions 69
11. Subscriptions 71
11.1. My subscriptions 71
11.2. Subscriptions within dashboard 71
11.3. Subscription details 72
11.4. Send subscriptions conditionally 73
11.5. Impersonate subscriptions data usage 74
12. Mobile Dashboards View 74

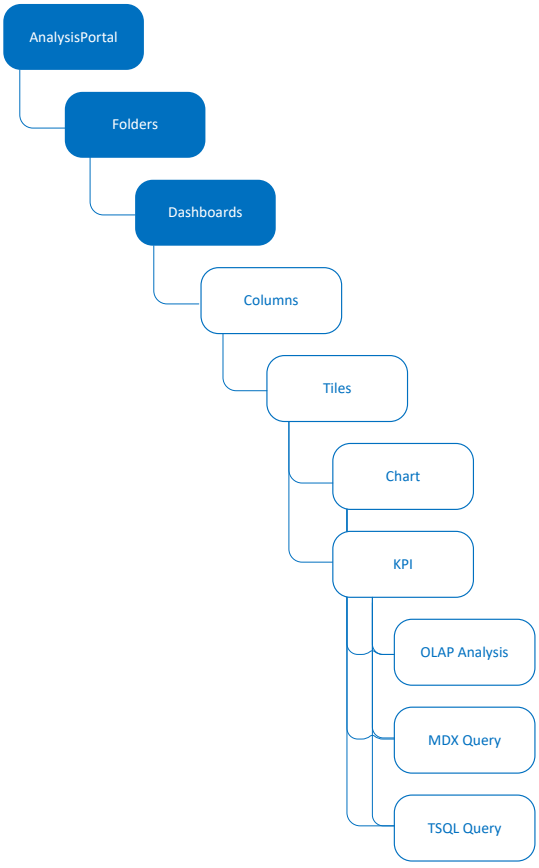
12.1. Connect Mobile Device to Kyubit Business Intelligence 75
12.2. OLAP Analysis on Mobile Dashboards 76
13. Multipage Reports 78
14. Dashboard Data Slideshow 79
15. Integrate dashboards with other web applications and sites 80
16. Geo Maps available lists of keys 82
16.1. Continents 82
16.2. World, Africa, Asia, Europe, Oceania, South America, North America 82
16.3. USA 86
16.4. India 87
16.5. Norway 88
16.6. Spain 88
16.7. Australia 89
16.8. France 90
16.9. Thailand 90
16.10. Russia 92
16.11. Netherlands 94
16.12. Italy 94
16.13. Germany 95
16.14. Switzerland 95
16.15. US – States 96

1. Dashboard features overview

Dashboard presents data from Microsoft OLAP and SQL databases, to give simple and comprehensive feedback about critical business values and trends. While creating dashboard, user has various visual options to present data most efficiently regarding the nature of data and user expectations. Easy drag-and-drop features makes dashboard creation simple and straightforward task, which is easy to adopt and fun to use. To retrieve data for dashboard elements, existing OLAP analyses on Kyubit Business Intelligence could be used or SQL/MDX queries could be created. Dashboards could be also delivered to users on scheduled subscriptions or integrated within third web applications and sites. To work with dashboard features, select 'Dashboards' tab on the top of the Kyubit Business Intelligence application.



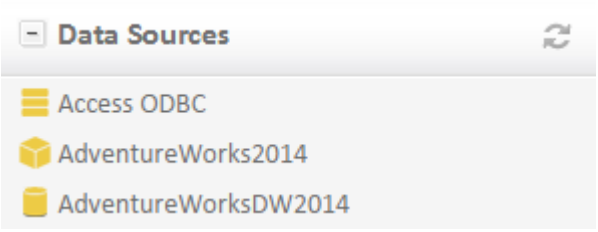
(Kyubit Business Intelligence Dashboards - Entities schema)



2. Managing Data Sources

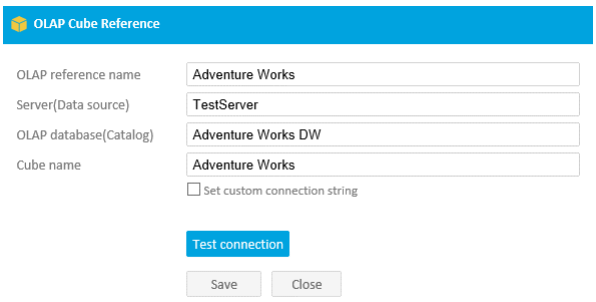
All data for dashboard elements is retrieved from data sources that contains interesting business data for presentation. Once created, data sources are used from multiple queries and analysis. To see all existing data sources in Kyubit Business Intelligence, open Dashboards -> Data Source (tab).

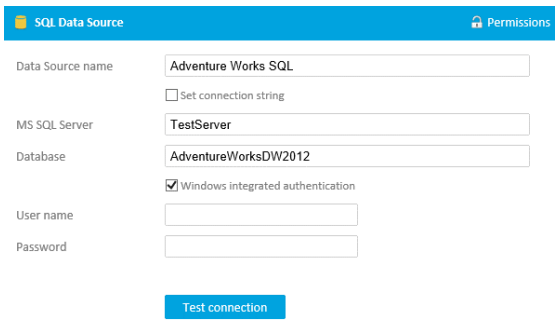
It is possible to create OLAP, SQL Server and ODBC data sources.



2.1. OLAP and SQL server data sources

Create new OLAP or SQL data source to be used for queries and analyses. Once created 'Data source' can be used on multiple objects in Kyubit Business Intelligence and by the users who are given permission to work with.

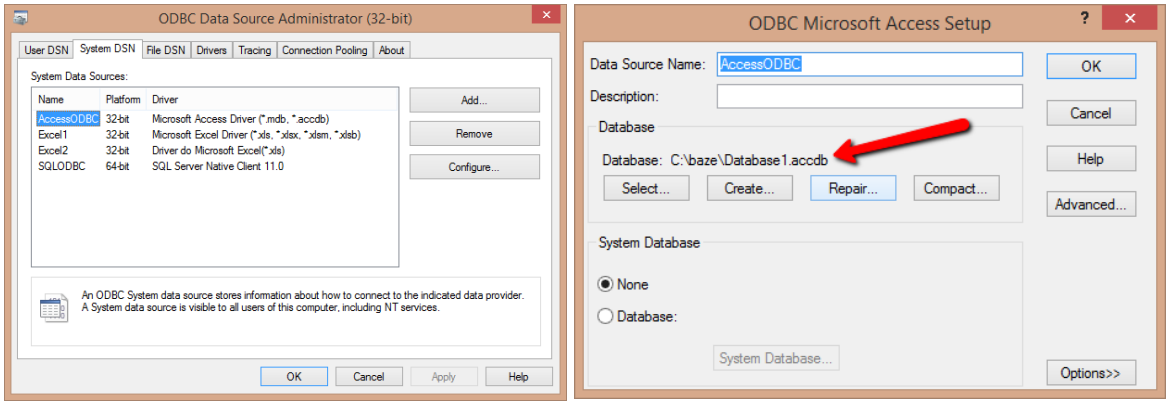




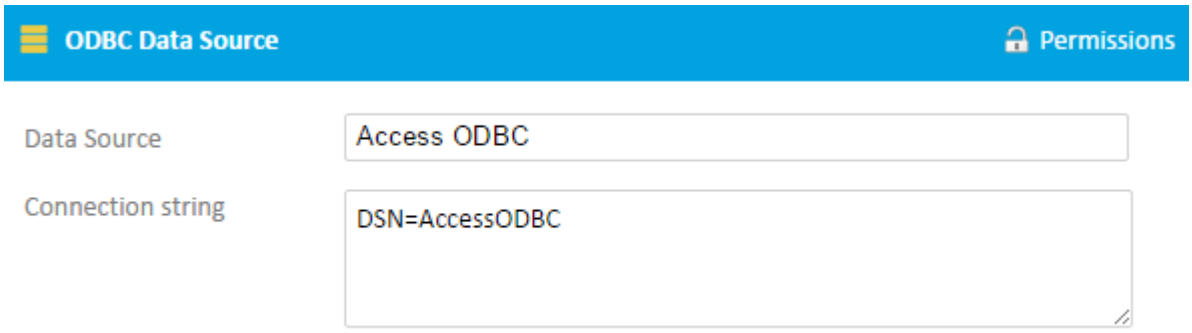
For both, OLAP and SQL data sources, custom connection strings could be set and connection could be tested before data source is save.

2.2. Set up ODBC data source

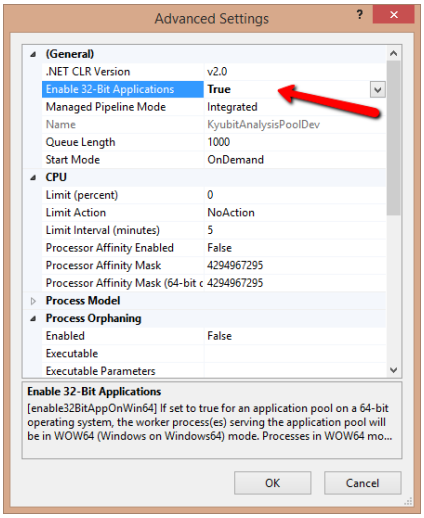
To create ODBC data source, first configure ODBC connection on your machine.
For example, create ODBC connection to Excel or Access files on your system.



Data Source Name that for ODBC connection use to create Data Source in Kyubit application.

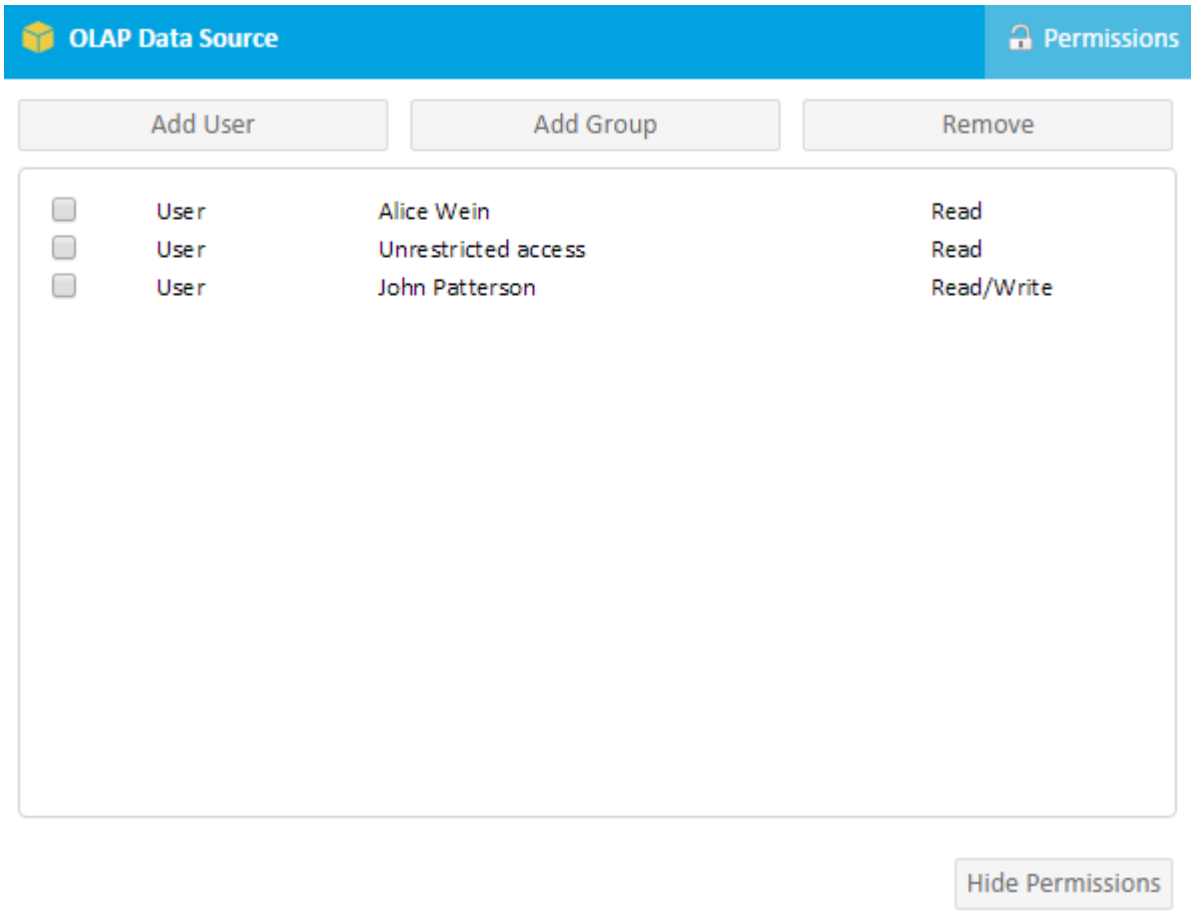


To set up ODBC data source for MS Office applications, which are available only for 32-bit ODBC configuration, it is also required to configure Kyubit application to work in 32-bit mode. Open IIS Manager -> Application pools -> “KyubitAnalysisPool” - > Advanced Settings and set “Enable 32-bit application” to “True”.



2.3. Set Data Source permissions

If Data Source should be visible to other users, click on the 'Permissions' options in the upper-right corner and add appropriate Active Directory users and groups to have 'Read' or 'Read/Write' permissions or set unrestricted access to created Data Source. (See chapter 7.1. for more details)



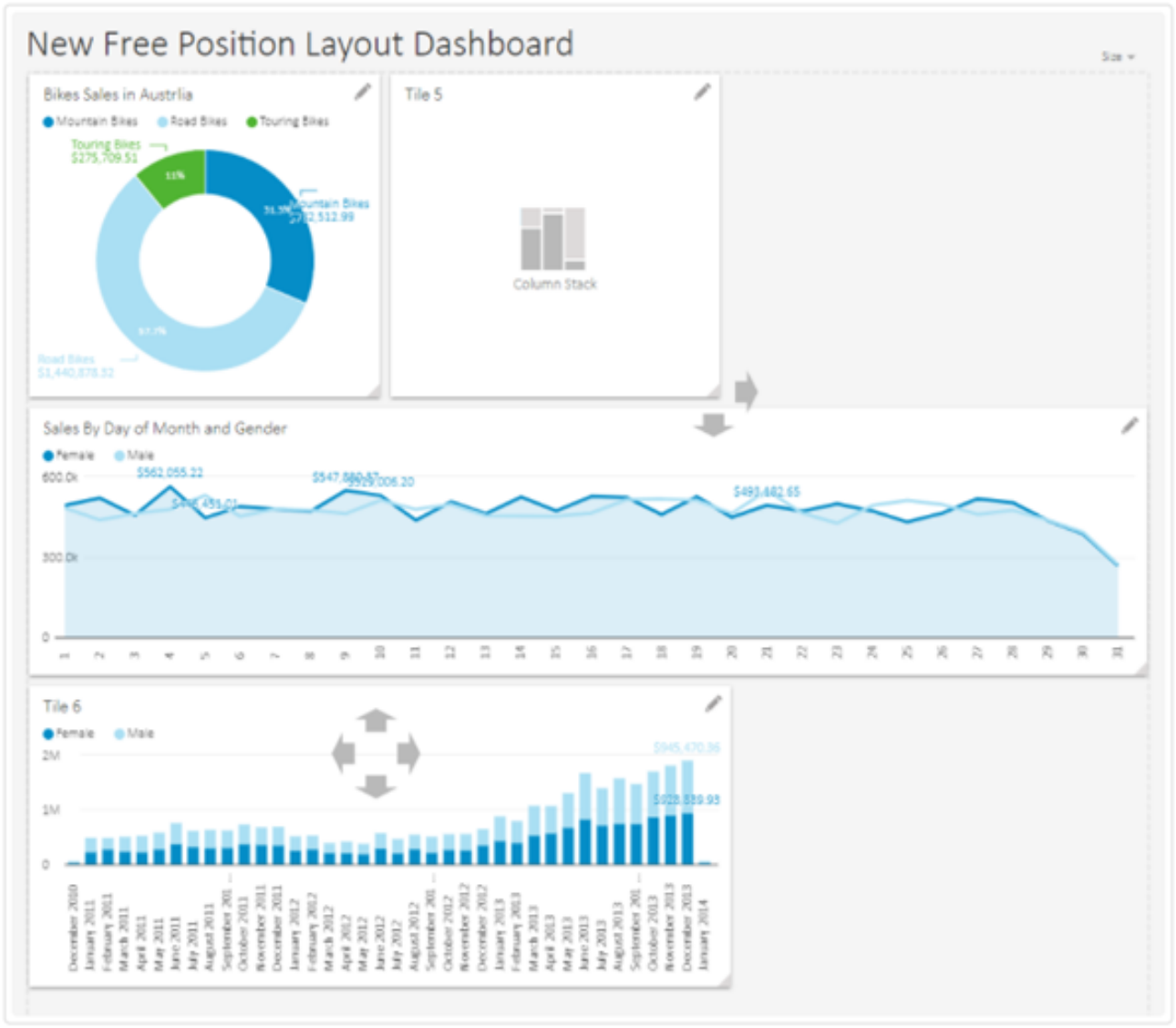
If user does not have 'Read' permission on data source, he will not be able to create new queries and analyses based on same 'Data Source', but he will be able to open dashboard with queries and analyses based on same 'Data Source'

3. Creating and designing dashboards

All users with access to Kyubit Business Intelligence application could create new dashboards. To start creation of new dashboard, click 'Create New Dashboard' button on the dashboards view. New Dashboard will be opened in design view, ready to be designed and configured.

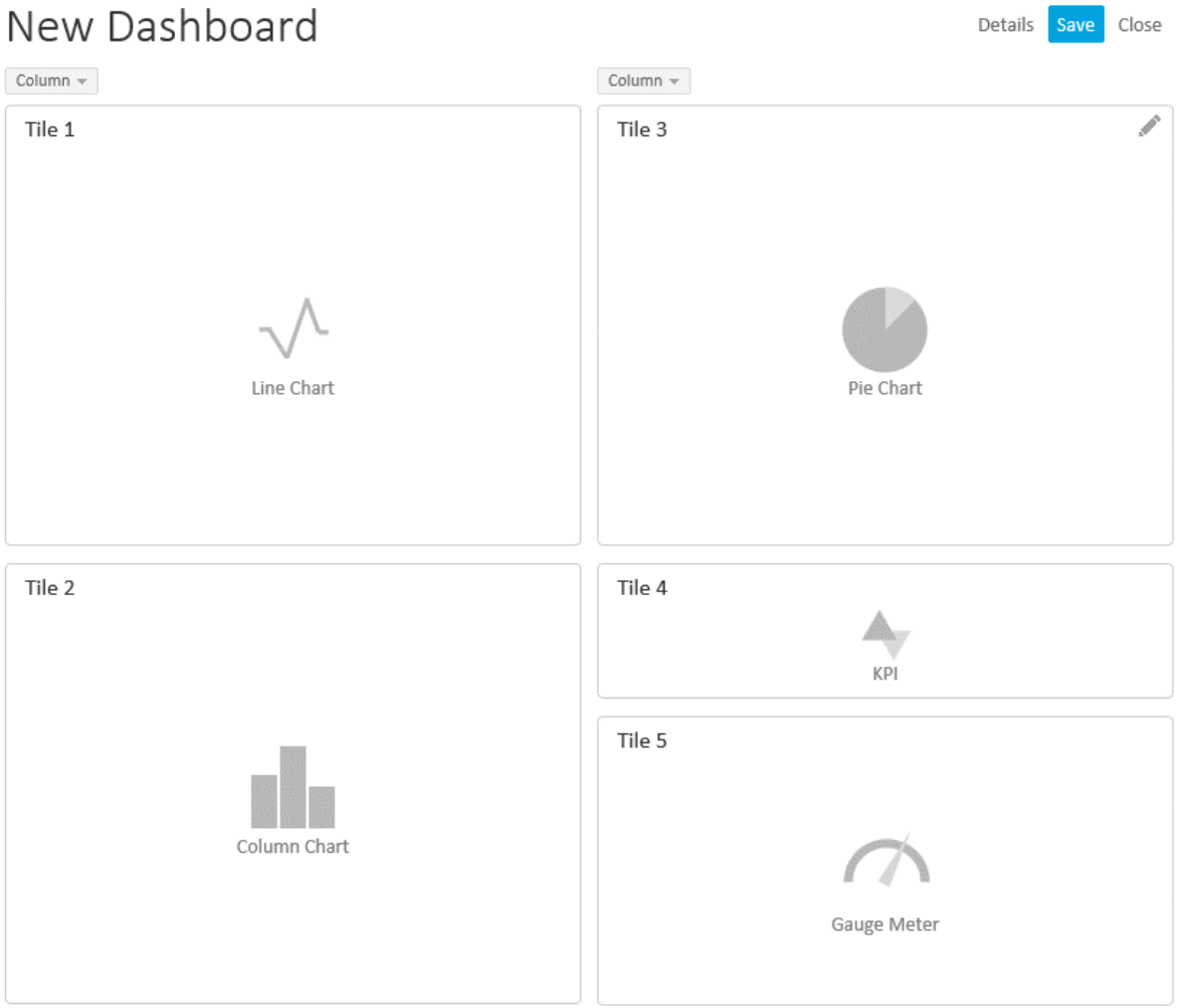
3.1. Free Position – Dashboard Layout

In this dashboard layout mode, dashboard consist of one area where dashboard tiles (charts) are positioned in any preferred way. Drag-and-drop any visualization tile from the charts toolbar on the dashboard and set its position and size on the dashboard 'Area'. To resize tile, click on the resizing handle (arrow) on the tile lower-right side. While moving around and resizing particular tile, element size indicator is displayed on the lower-right side of tile element, indicating tile size in pixels, so dashboard designer could easily compare and organize content on the dashboard. Tiles are moved and resized by 10px step, making it easy to align among other dashboard tiles. Dashboard 'Area' is always positioned centrally on the dashboard page and at any time set 'Area' size with the button on the right. Arranged positions and sizes of dashboard tiles are respected while exporting dashboard to PDF (Simple Export). To remove tile from the dashboard, click on the tile edit and trash icon.



3.2. Column Based – Dashboard Layout

In this layout mode, dashboards consist of dashboard elements (tiles) that are arranged in dashboard columns. Dashboard columns can accept any number of tiles that will be displayed vertically. Each tile needs to be defined what kind of visualization and data it will display. By default, dashboard contains two columns and columns could be added and removed.



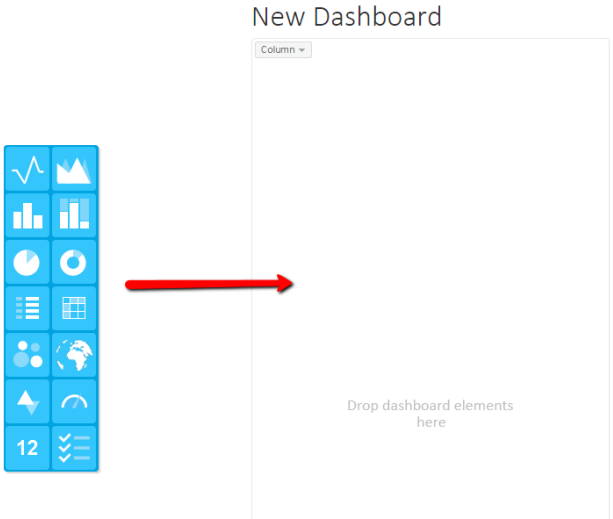
3.3. Working with Tiles

On every dashboard user can add 18 different types of dashboard element (tiles) that present some kind of data visualization. On the toolbar on the right, tile types are presented with descriptive icons.

- Line chart
- Column chart
- Column chart stacked
- Column chart 100%
- Area chart
- Area chart stacked
- Area chart 100%
- Pie chart
- Doughnut
- Bubble chart
- Table
- KPI
- Gauge meter
- List
- Geo Map
- Card
- Small Card
- Combo chart
- Tree Map chart
- Goal Meter

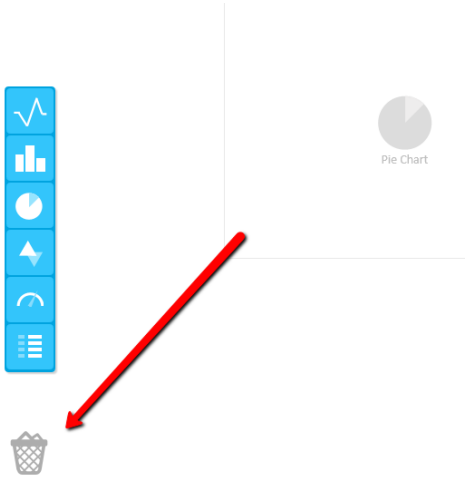
3.3.1. Add tile to dashboard

To add tile to dashboard, drag-and-drop preferred tile type (visualization) from toolbar on the left to one of the column on the right.



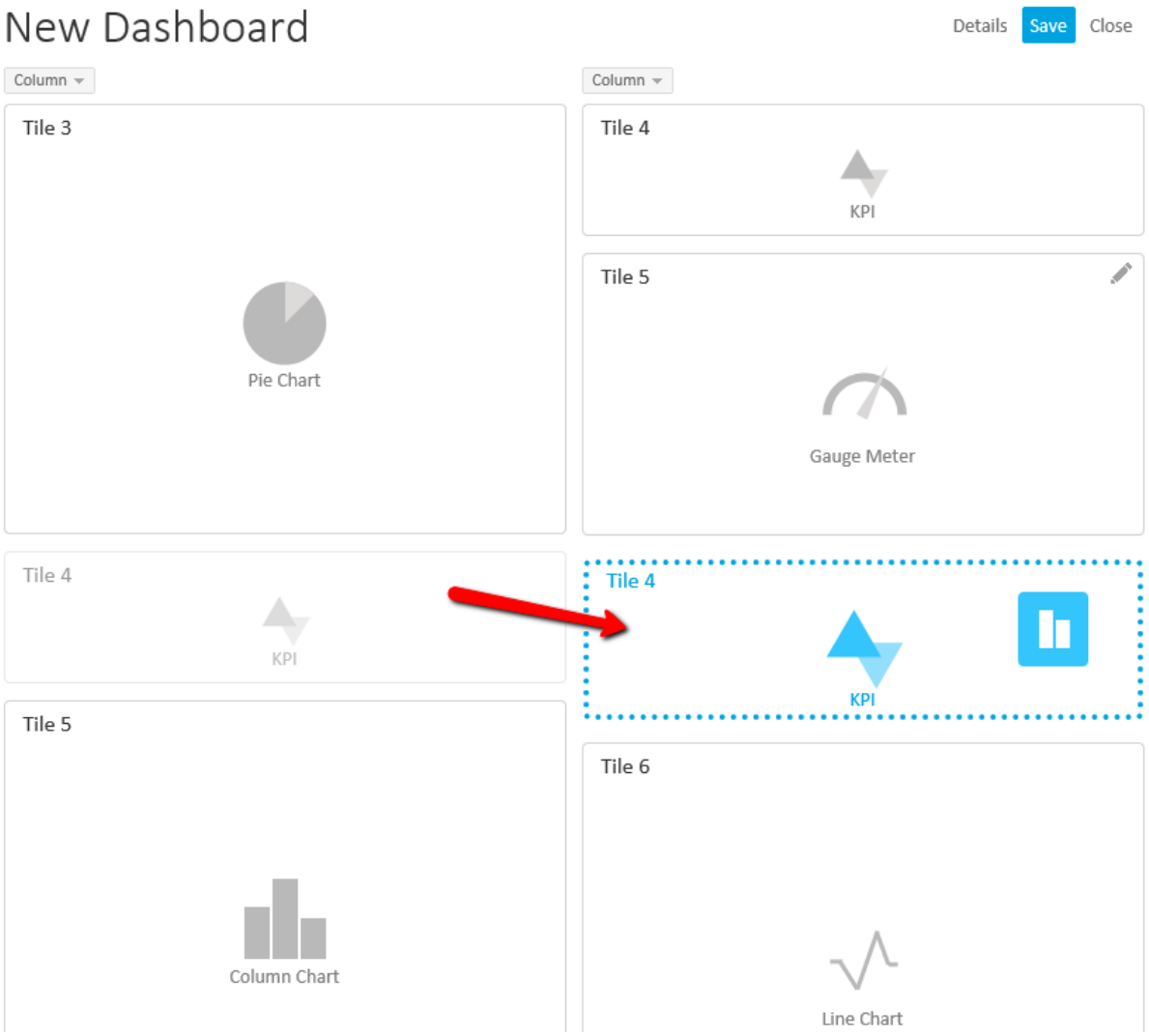
3.3.2. Remove tile from dashboard

To remove tile (delete) from dashboard drag-and-drop tile from dashboard column to trash icon on the left, that is visible when drag-and-drop operation is started.



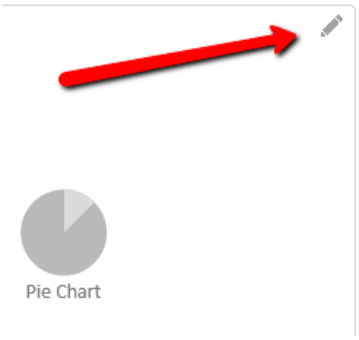
3.3.3. Rearrange tiles on dashboard

At any time in design view, tiles could be rearranged with same dashboard column or moved to any position on another dashboard column. Simply drag-and-drop tiles to preferred location on any of the columns. New location of drag-and-drop tile will be displayed in blue color.

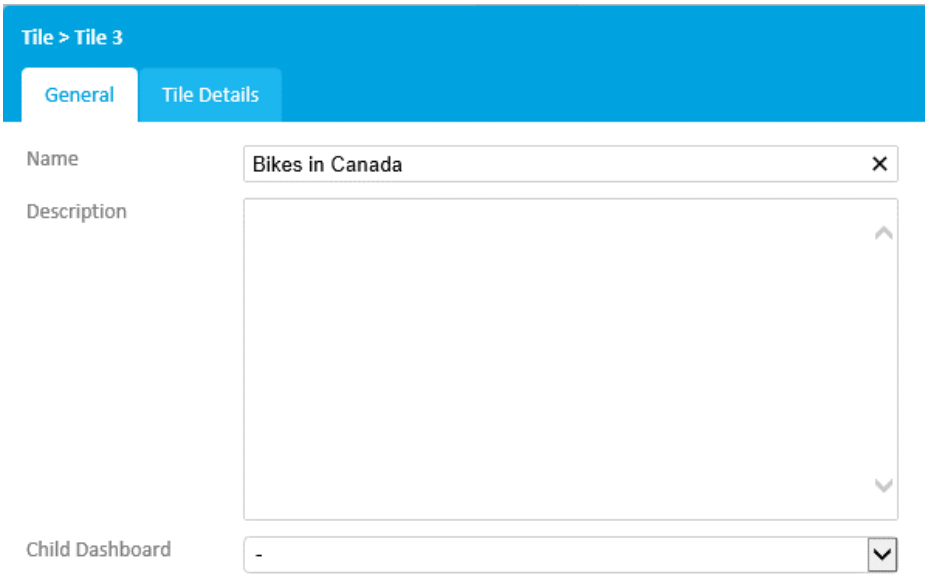


3.3.4. Configure tile to show visualization

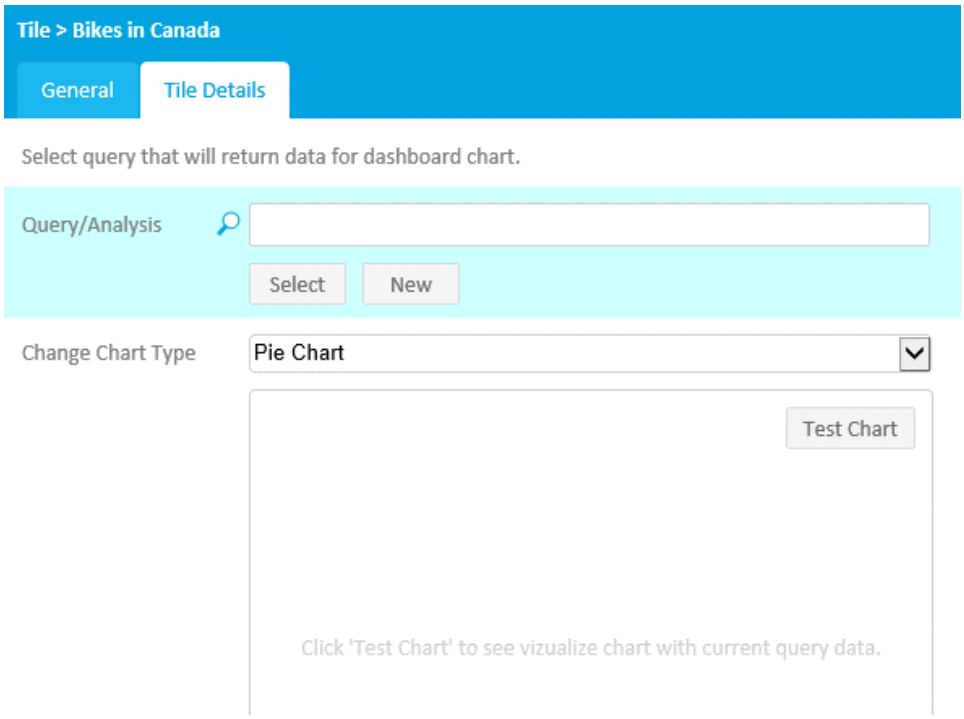
When moving mouse over tile (while dashboard is in design mode) 'Pen' icon is displayed, which allows user to click and open tile configuration form.



Enter dashboard general information: like title, description and, if you like, set child dashboard that will be opened as more detailed view on the same data, enabling users to have 'drill down' experience while using dashboards.

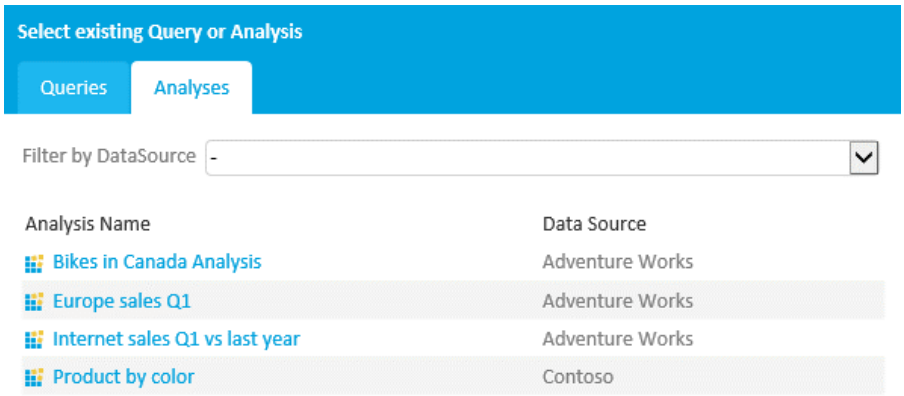


'Tile Details' is second tab on the tile form, where data to visualize will be defined.

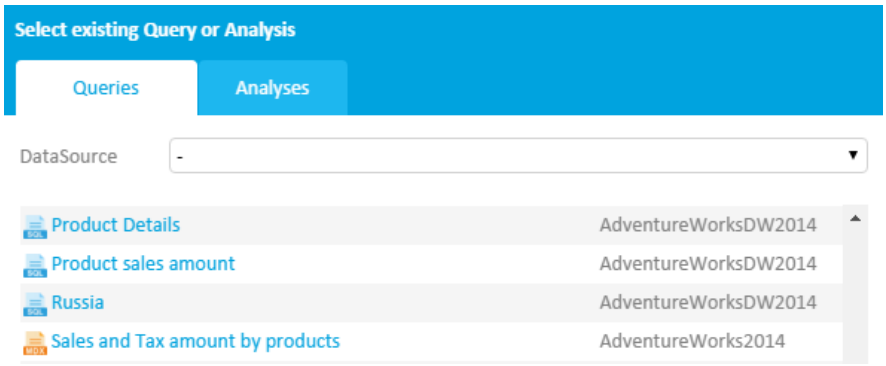


'Query/Analysis' is input where user selects existing Analysis or Query (TSQL or MDX) to retrieve data to show in this tile visualization ('Pie' in this case). Existing 'Analysis' means that OLAP analysis is created in 'Analysis' part of Kyubit Business Intelligence application and current user has permissions to read at least. Existing Query (TSQL or MDX) means, that query is created in 'Dashboards' part of Kyubit Business Intelligence application and current user has permissions to read at least. If query user needs still does not exists, user could click on 'New' button and right away from tile form create new MDX or TSQL query. To select existing analysis or query, click on the 'Select' button and selection form of existing Analyses and Queries will be displayed.

ANALYSIS SELECTION…

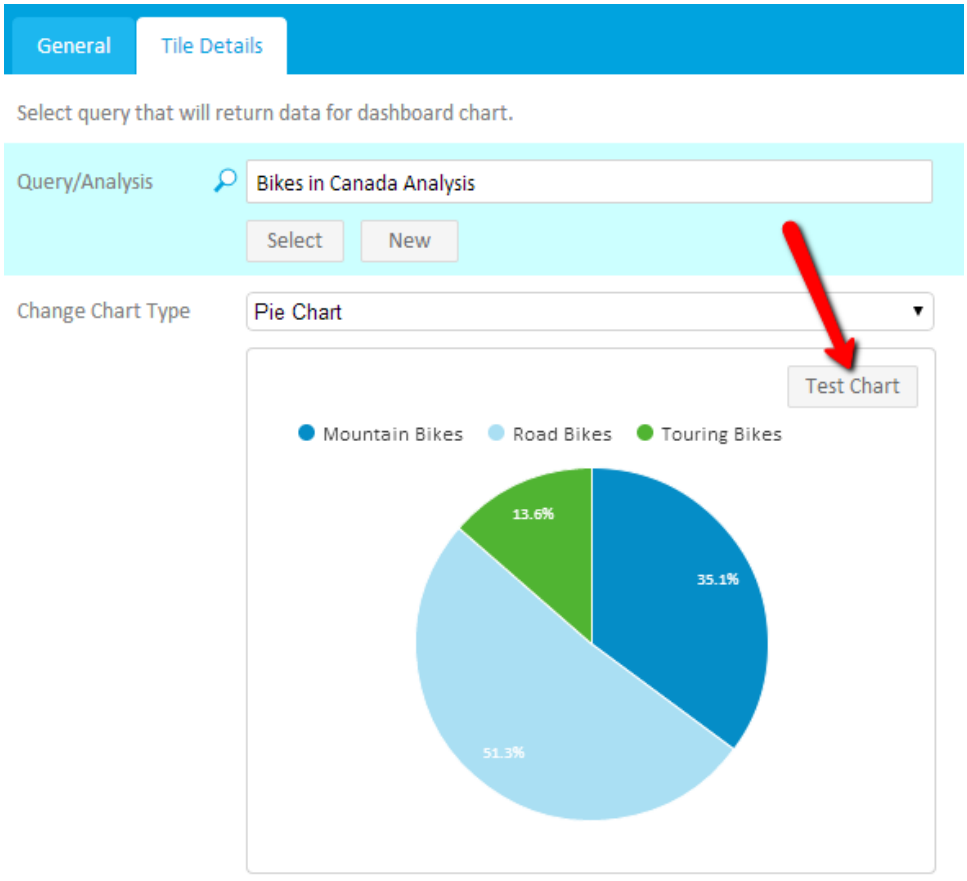


… OR QUERY SELECTION …



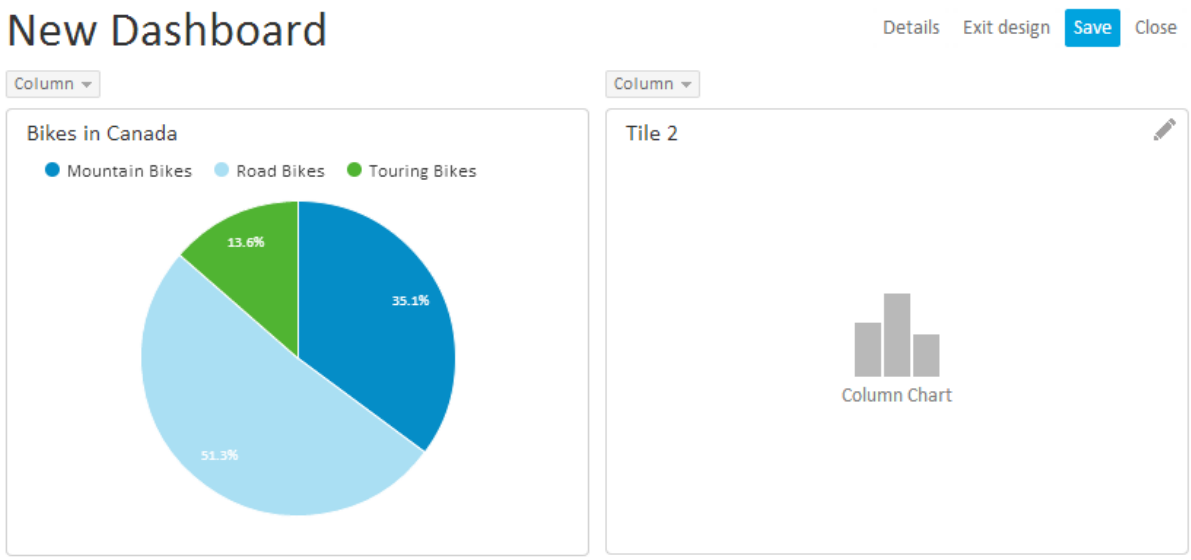
All analysis created within Kyubit Business Intelligence for which current user has at least 'Read' permission are displayed in selection form. Displayed list could be filtered by 'Data Source' for environments with many analyses. Same principles works for Query selection.

After Analysis/Query is selected, click on 'Test' button in tile form to test visualization with selected analysis/query data.

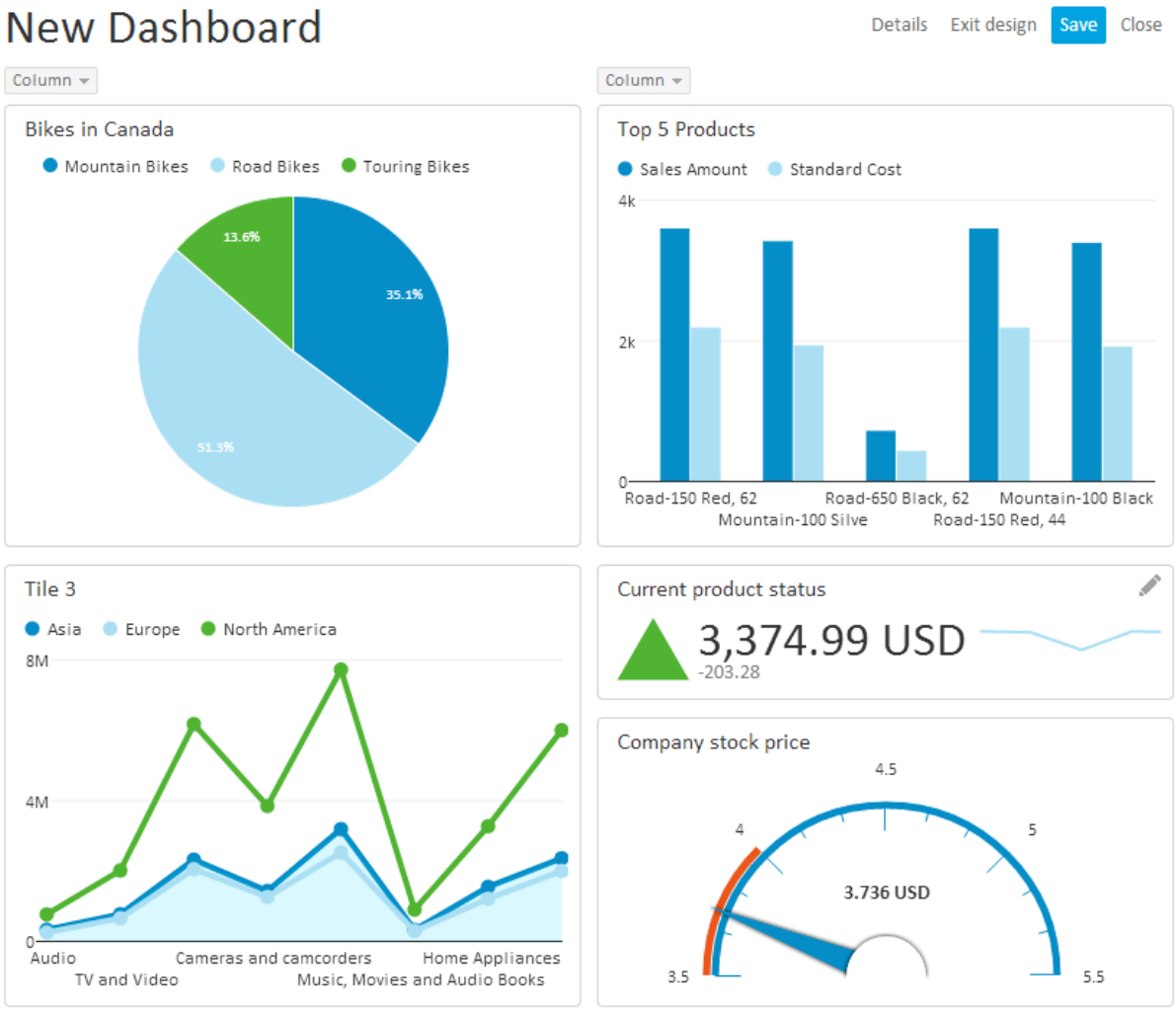


In tile configuration form, user still can change tile (visualization) type, if concludes that given data is more appropriate to show with different chart type.

Finally, click 'OK' in tile configuration form and tile will present data within dashboard area.

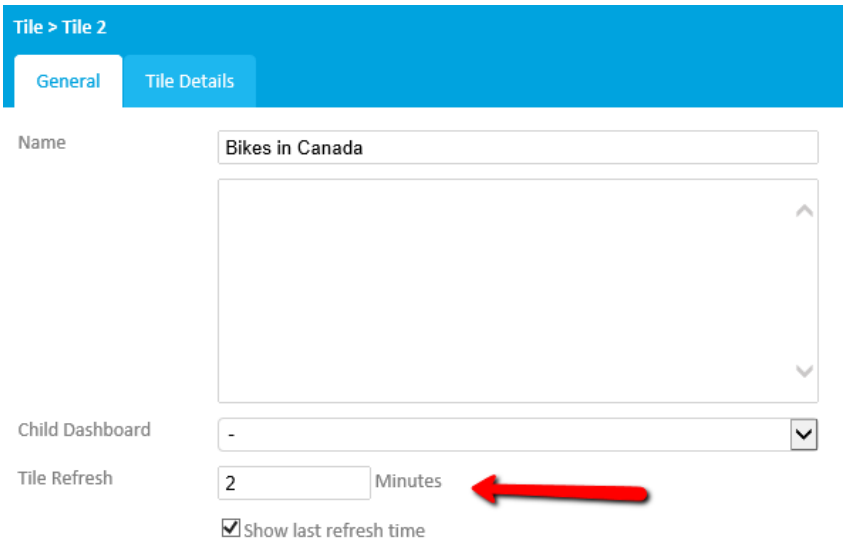


Using same principles configure other tiles to appropriate visualize other relevant business data on dashboard…

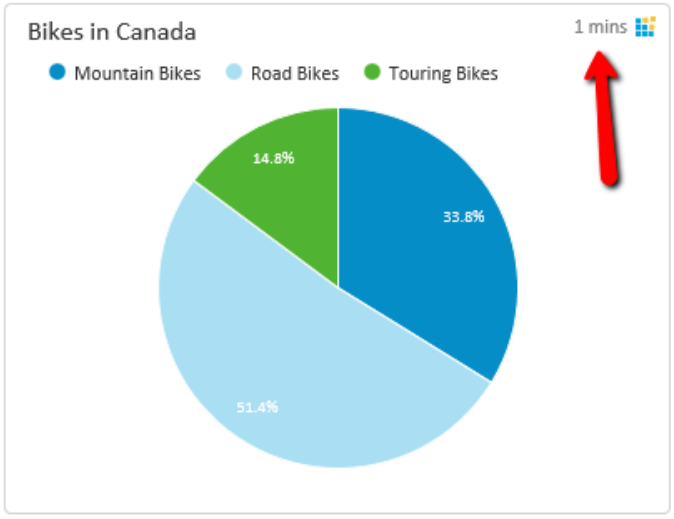


3.4. Tile automatic data refresh

Every dashboard tile could be configured to automatically refresh data in a defined period of time in minutes. Only tiles with defined 'Tile Refresh' attribute will be refreshed with new data.

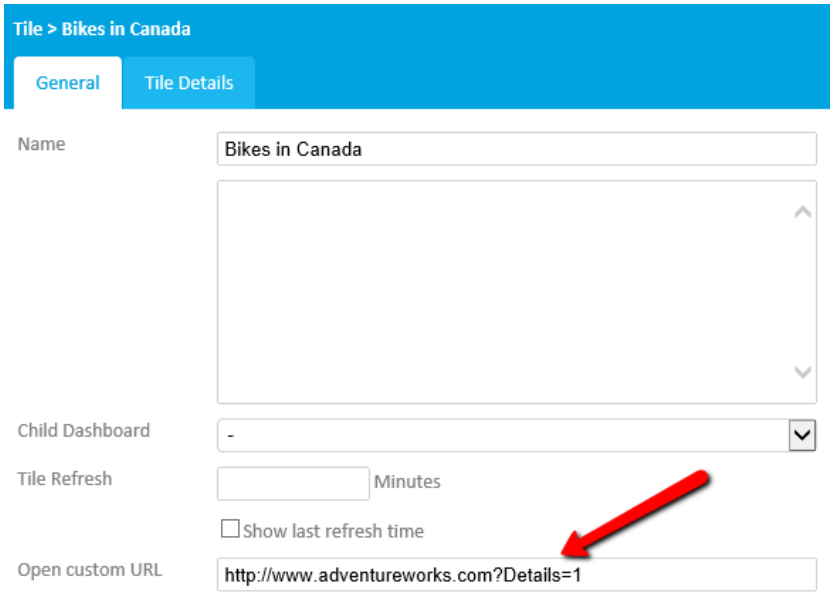


If option 'Show last refresh time' is checked, dashboard tile will display time passed since last data refresh in dashboard.



3.5. Open custom link in a context of dashboard data

To open custom link when user clicks on a dashboard tile element, set 'Open custom URL' attribute of tile.



By clicking on a dashboard tile element, new browser tab will be opened with URL that is defined, but also with additional URL query string that is created within context of point/bar/wedge which is actually clicked/selected.

For example:

http://www.adventureworks.com?Details=1**&pointName=United States&pointUnique=[Geography].[Geography Hierarchy].[Region Country Name].&[United States]**

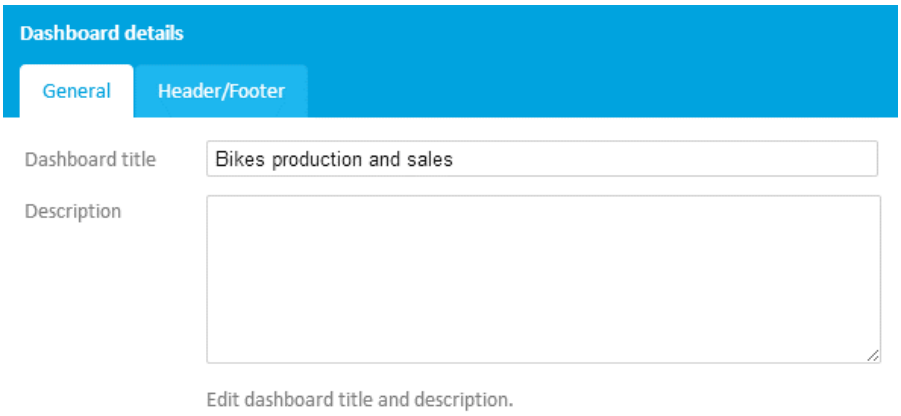
If dashboard contains added OLAP filters, they will be also part of the create URL in a separate parameter.

If data source is based on SQL data, added query string will be based category id defined in query object.

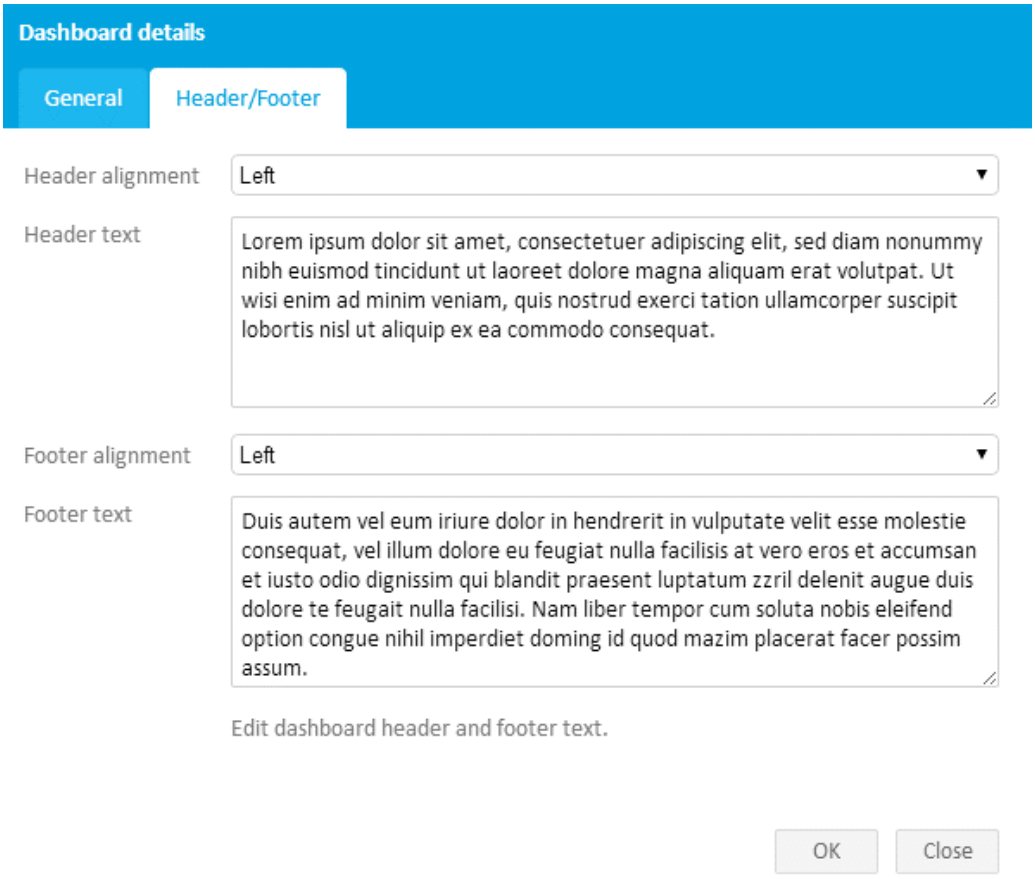
If chart is based on SQL query. Custom link URL will open "Category name" defined in query or "Category ID", if it is defined within query column that represents "Category ID".

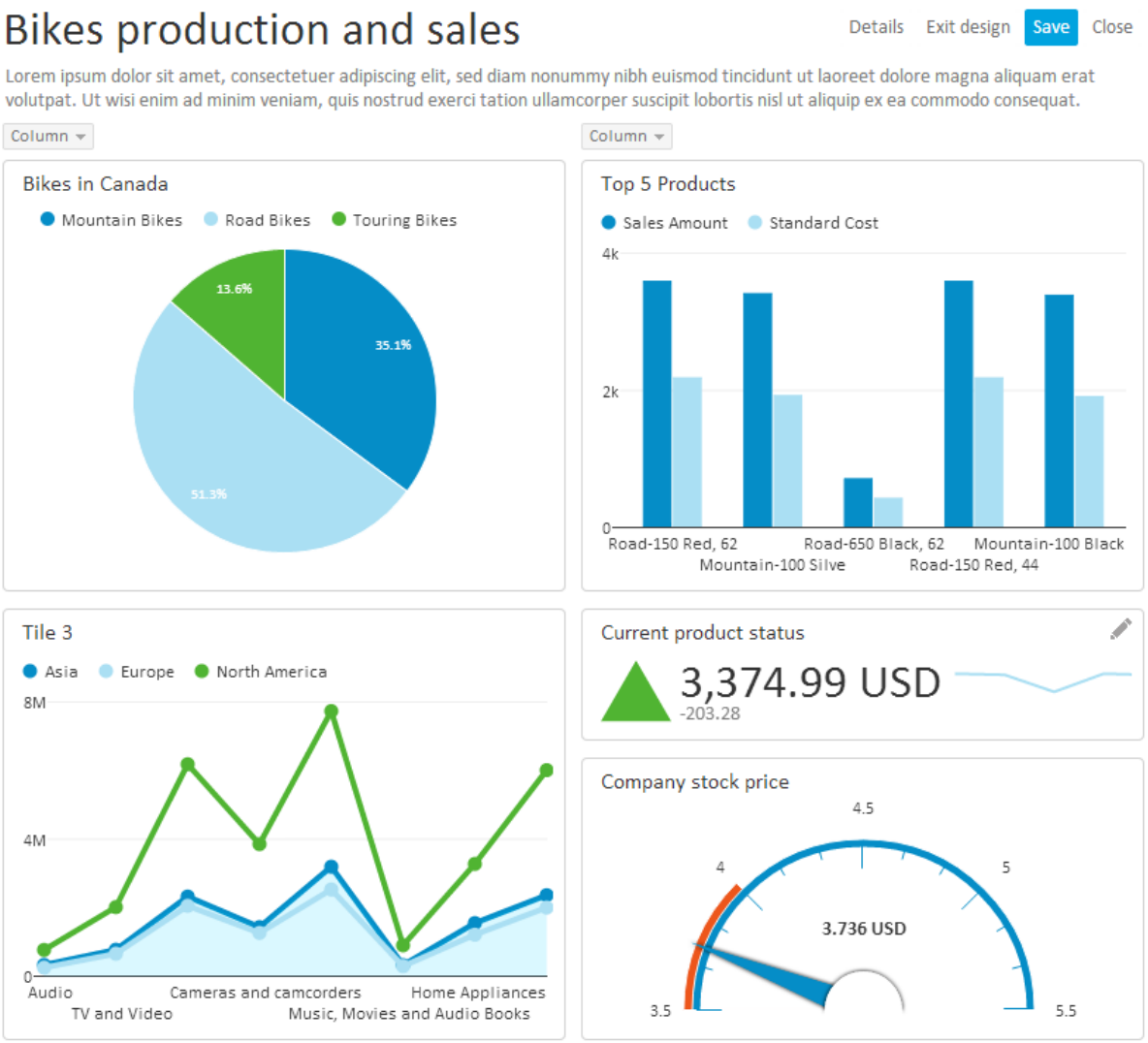
3.6. Dashboard title, header and footer

While in dashboard 'design view' click on the 'Details' button to define dashboard 'Title', 'Description' on the 'General' tab.



On the 'Header/Footer' tab set appropriately dashboard header and/or footer and its alignments text and alignments…





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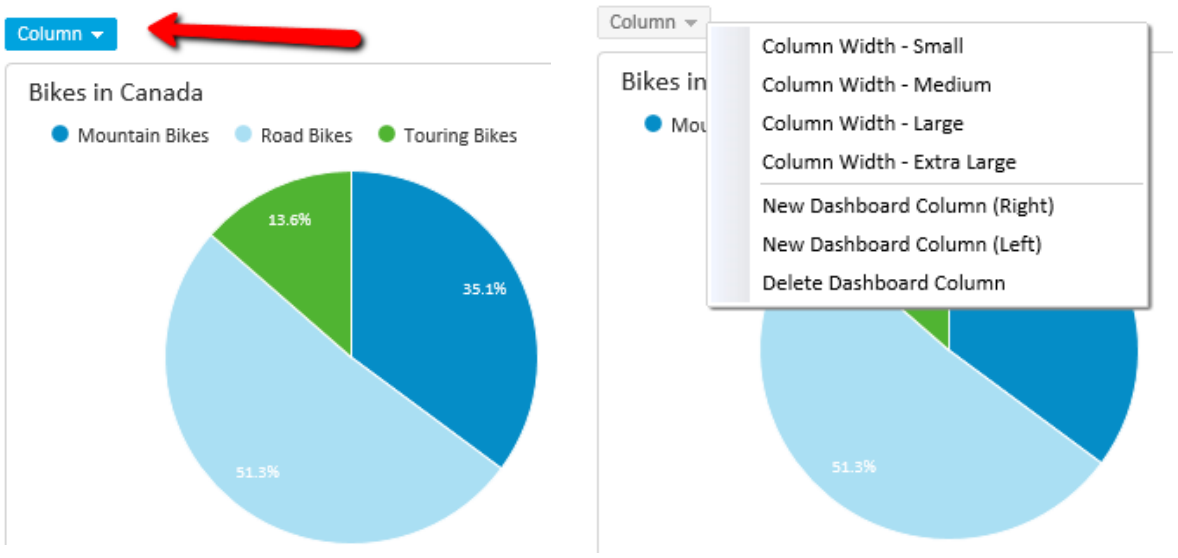
3.7. Manage columns on dashboard

In 'Column Based' layout mode, dashboard columns are containers for dashboard visual elements (tiles). While working in design mode, it is possible to add or remove dashboard columns. Dashboard can contain from 1 to 5 dashboard columns.

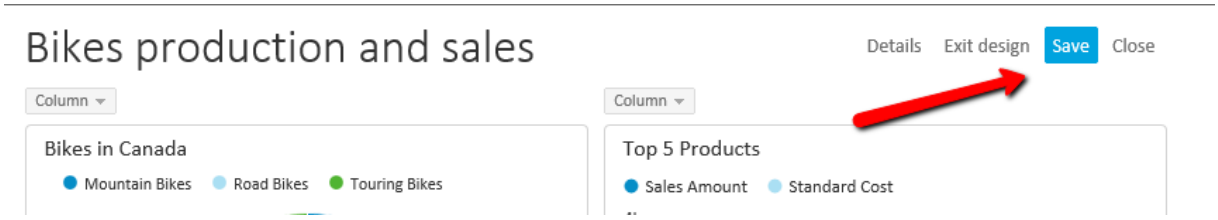
To add column, remove column or edit column width click on the 'Column' button which is located above every dashboard column and select one of appropriate actions.



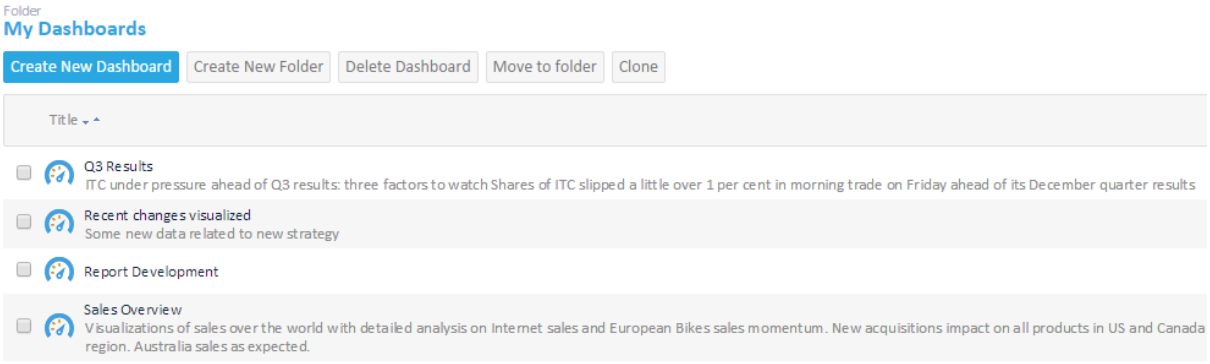
For each dashboard column new column could be added on the 'Left' or 'Right' side of the selected column, changed width to 4 predefined column widths or to delete selected column.

3.8. Saving Dashboard

All work in design mode needs to be saved with the 'Save' button in upper-right area of the dashboard. Within 'Save' action all tiles, their settings and arrangements are saved for future dashboard openings.



Dashboard immediately appears in 'My Dashboards' list, ready to be used.



3.9. Enter and exit 'Design' view for dashboard

After existing dashboard is opened, design options are disabled and only users with 'Read/Write' permissions on the dashboard could choose to continue design work on the dashboard. While user is not in 'design' view, dashboard data, tiles and all dashboard arrangements are not available to change. 'Design' mode is just slightly different than 'Regular' view, so at the end of design, user should 'Exit design' to see exactly how other users will see dashboard while consuming prepared dashboard details.

3.10. URL to access dashboards

Kyubit Business Intelligence offers more than one way to access dashboards and particular dashboard.

To access available dashboards use:

http://yoursite/dashboards

or

http://yoursite/forms/dashboards.aspx

To access single dashboard use:

http://yoursite/dashboard/123

or

http://yoursite/forms/dashboard.aspx?dashboardID=123

4. Configuring dashboard tiles

After adopting general dashboard design and construction details, this chapter describes how to create all visual details on the dashboard elements (tiles) to best reflect business data situations and give end-users clear and easy-to-understand status of business important values and indicators. Dashboard could display 2 group of visual elements, Chart and Key Performance Indicators (KPIs).

Charts:

- Line Chart, most appropriate to show time related data.
- Column Chart, most appropriate to show multiple series data.
- Pie Chart, most appropriate to show single data with one-series data.
- List, most appropriate to show ordered list with names and numbers.
- Geo Map, most appropriate to show data related to geography (world countries and regions)

KPIs:

- Standard KPI, show KPI icon, KPI value, last change and optionally small line chart that describes KPI values in the past to the current one.
- Gauge Meter, is KPI presentation with Gauge visualization, giving feeling to end user, how much current value is successful.

4.1. Data usage within tiles (Categories and series)

After drag-and-drop tile to dashboard, click to edit tile (Pen icon), choose dashboard title and select or create analysis/query that will feed current tile with data we like to visualize.

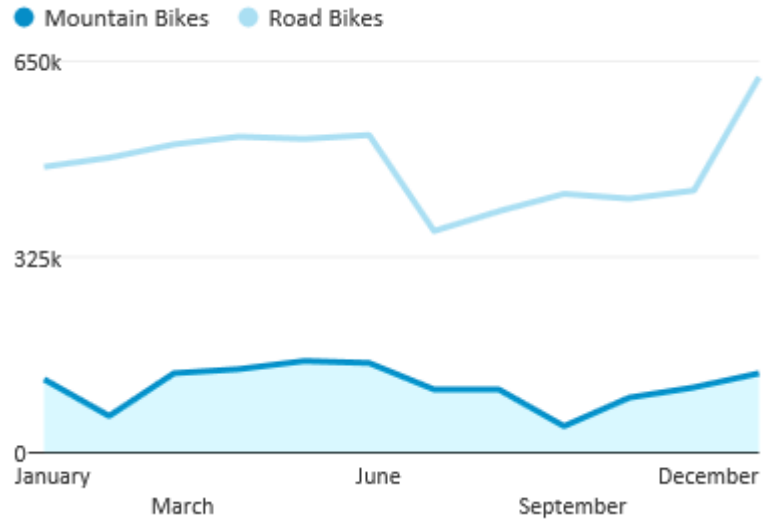
Essentially, each dashboard tile is receiving data in the format of categories and series. Column and line charts could accept many series of values, list chart accepts one or two series of values, while Pie chart, KPI and Gauge meter accepts only one series of values to visualize data.

4.2. 'Analysis' data for dashboard tiles

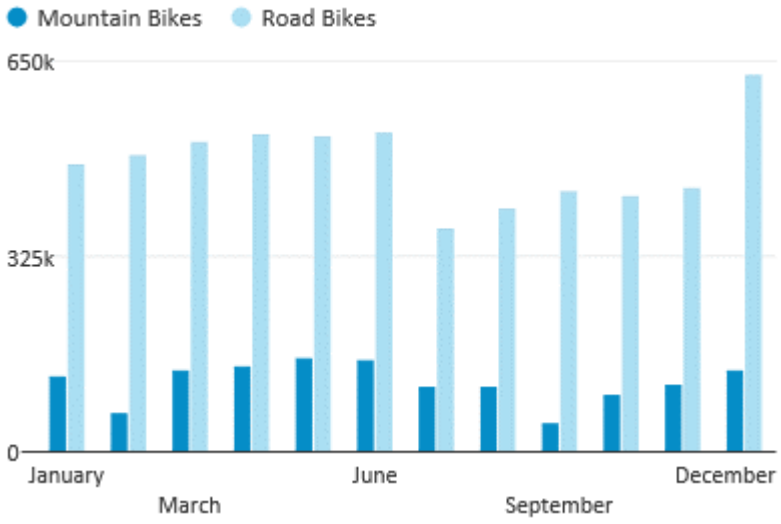
Analysis created in Kyubit Business Intelligence could be used as data for dashboard tile. Analysis rows presents are categories while columns in analysis presents series. In this example 'Month of Year' presents categories, while '(Product) Subcategories' present two series of values ('Mountain bikes' and 'Road Bikes').

When this analysis data is defined for dashboard tile, it will could be presented on these different ways using different visualizations (charts)

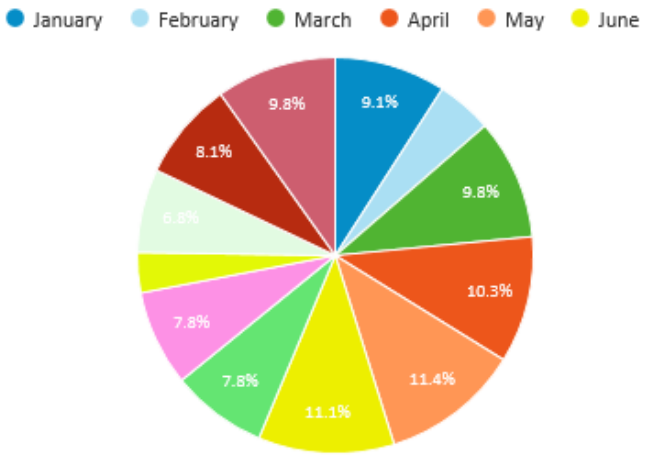
LINE CHART



COLUMN CHART



PIE CHART



(Note: pie chart shows only first series)

LIST CHART
(Data contains two series)

Month of Year	Mountain Bikes	Road Bikes
January	121.949,64 $	474.796,92 $
February	60.924,82 $	489.891,87 $
March	132.074,61 $	512.060,59 $
April	138.799,59 $	524.892,70 $
May	152.324,55 $	521.231,65 $
June	149.074,56 $	527.689,09 $
July	105.074,69 $	368.313,47 $
August	104.974,69 $	401.217,00 $
September	44.099,87 $	429.843,16 $
October	91.424,73 $	421.904,74 $

(Data contains one series)

Month of Year	Mountain Bikes
January	121.949,64 $
February	60.924,82 $
March	132.074,61 $
April	138.799,59 $
May	152.324,55 $
June	149.074,56 $
July	105.074,69 $
August	104.974,69 $
September	44.099,87 $
October	91.424,73 $

4.3. 'Geo Maps' configuration and usage

'Geo Maps' displays data related to world countries and regions in a geographical context. To correctly interpret retrieve data to 'countries' or 'regions', certain convention is expected. For countries, country names could be defined in English language or using two letter country codes (ISO 3166). Two letter country codes is recommended approach. For country regions, names of the regions are required in English language. For example, for US region data is expected as "Virginia", "North Carolina", "District of Columbia" etc.

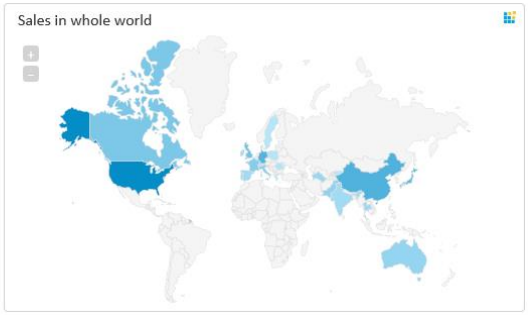
Kyubit Business Intelligence support Geo maps for all continents and major countries. List of available maps is expanded with almost every new version of Kyubit BI application.

Check end section of this document for detailed list of values that are supported when supplying data for Geo maps for various countries and regions.

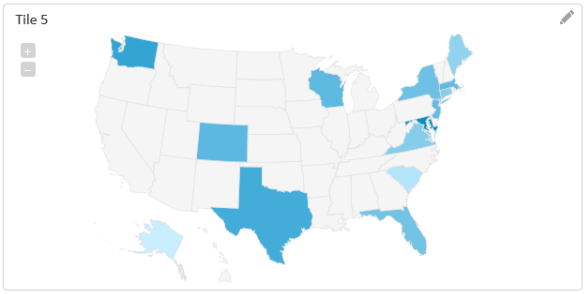
Please, contact support@kyubit.com for additional maps and region name conventions.

Examples…

Region Country Name	IT Machine Down Time
Armenia	748
Australia	2777
Bhutan	215
Canada	8361
China	37623
Denmark	95
France	5553
Germany	31515
Greece	200
India	1554
Iran	3444
Ireland	1567
Italy	4507
Japan	21482
Kyrgyzstan	350
Malta	446
Pakistan	3709
Poland	413
Portugal	1593
Romania	469
Russia	5782
Singapore	122
Slovenia	1551
South Korea	1309
Spain	1442
Sweden	384
Switzerland	473
Syria	10308
Taiwan	296
Thailand	1818
the Netherlands	2547
Turkmenistan	2245
United Kingdom	12997
United States	228804
Sum	Σ 396699



State Province Name	Sales Amount
Alaska	$22.786.936,44
Colorado	$479.343.655,50
Connecticut	$179.553.290,07
Florida	$291.138.194,37
Maine	$136.784.555,29
Maryland	$2.268.325.223,96
Massachusetts	$431.952.060,98
New Jersey	$391.396.628,18
New York	$317.099.887,75
South Carolina	$46.289.982,00
Texas	$769.424.994,66
Virginia	$178.943.325,51
Washington	$1.058.348.463,92
Wisconsin	$465.269.258,85
Sum	Σ $7.036.656.457,48



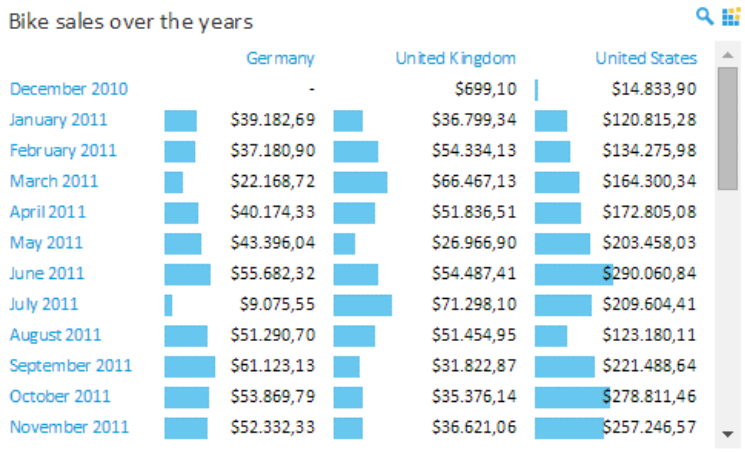
4.4. 'Table' chart visualization

'Table' is specific dashboard tile type that presents categories and series with rows and columns and it is not limited to large data sets. If visualization displays large number of columns and rows scrollbars will become visible to navigate through data. 'Table' can show all the records from analysis, MDX or SQL queries with value formatting defined on analysis or query level.

Additional 'Options' are available while configure 'Table' tile.

User can manually set:

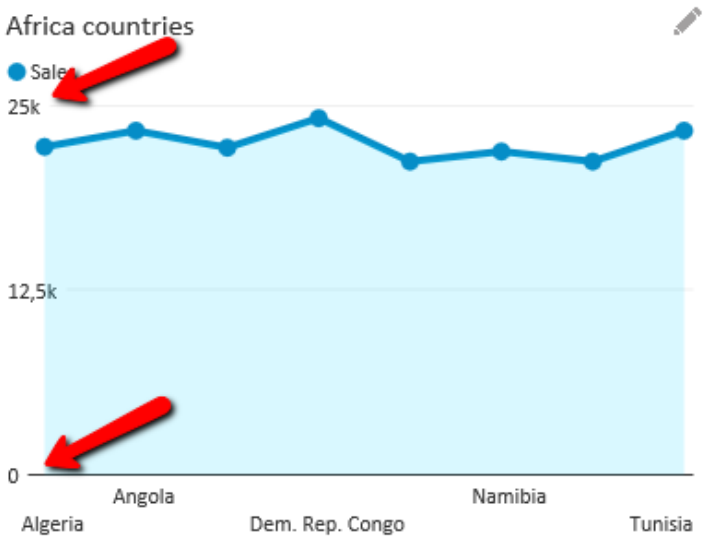
1) Desired height of the tile
2) Display of 'Value bar' indicators



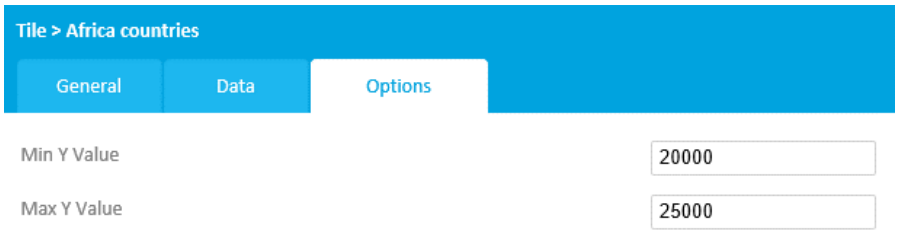
'Table' visualization cannot be exported in simple PDF dashboard export, but only in detailed PDF dashboard export, due to its specifics to support large data sets.

4.5. 'Line chart' custom 'Min Y' and 'Max Y' configuration

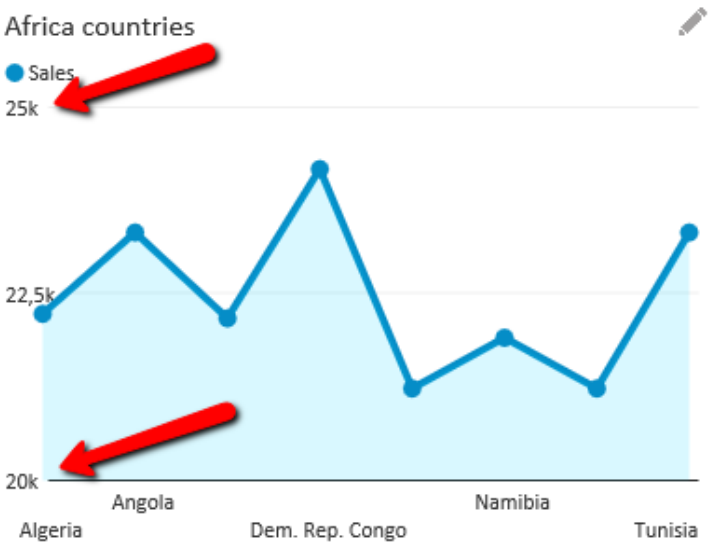
All dashboard charts automatically calculate what is the Y axis, min and max values to show. 'Line chart' has option to manually configure which segments on the Y axis you prefer to show. Default chart visualization for next chart…



…could be configured to show more precise segment of Y axis.

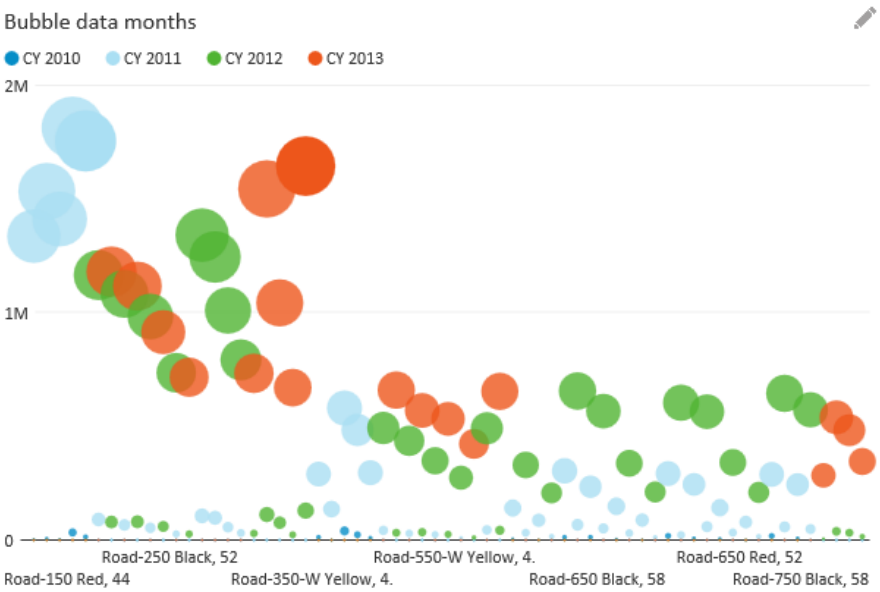


By setting Min Y and Max Y value user actually zoom area of values that are of current interest.



4.6. ‘Bubble chart’ specifics

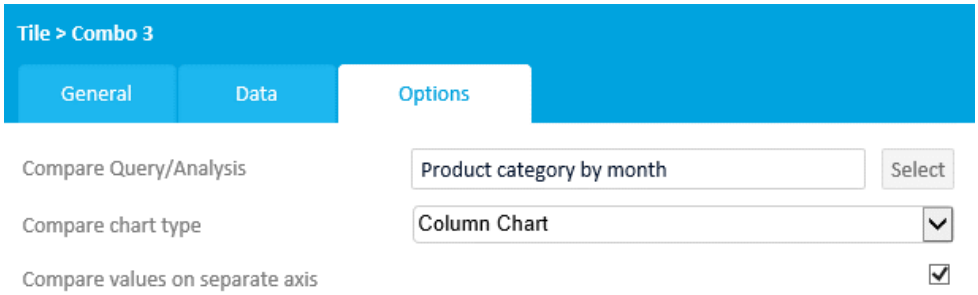
For OLAP analysis that contains two measures, ‘Bubble chart’ can visualize both measures, first as position on Y axis, while second measure as bubble size, to get quick insight to related OLAP data.

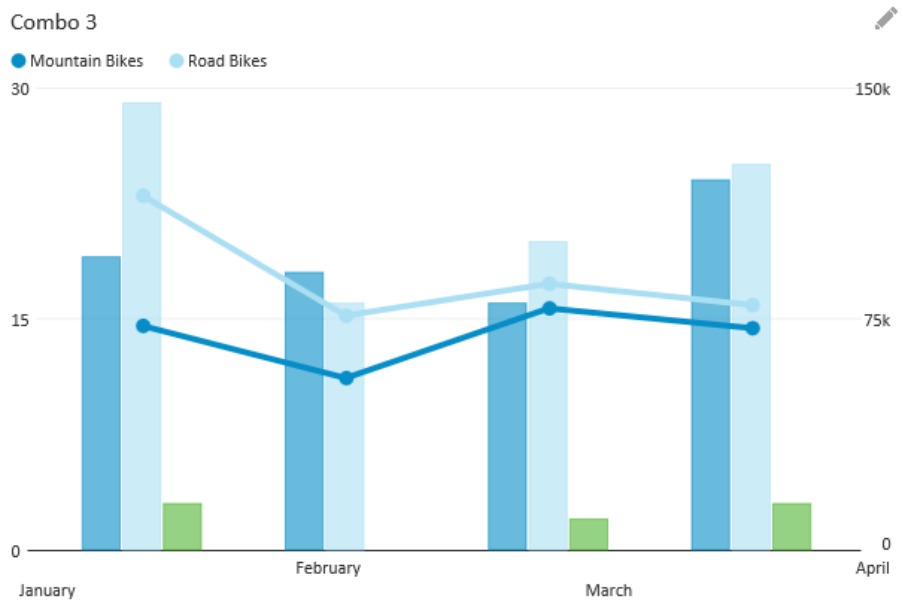


4.7. ‘Combo’ chart

To visualize and compare two data sets (analysis or query) on the same dashboard tile, ‘Combo’ chart visualization makes it possible.

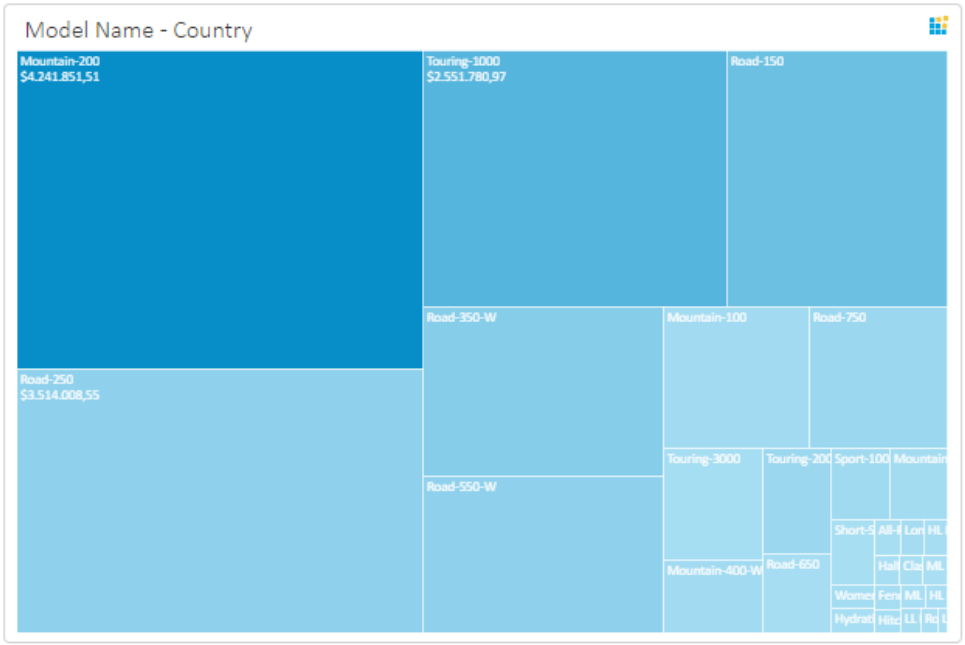
After selecting base data set and ‘Combo’ chart, additional ‘Options’ on the tile configuration enables you to choose secondary data set to compare over first selected. First data set is visualized as ‘Line chart’, while secondary data set could be visualized as ‘Line chart’ or ‘Column chart’. Secondary data set values could be displayed on same Y axis as first data set or on a separate Y axis.



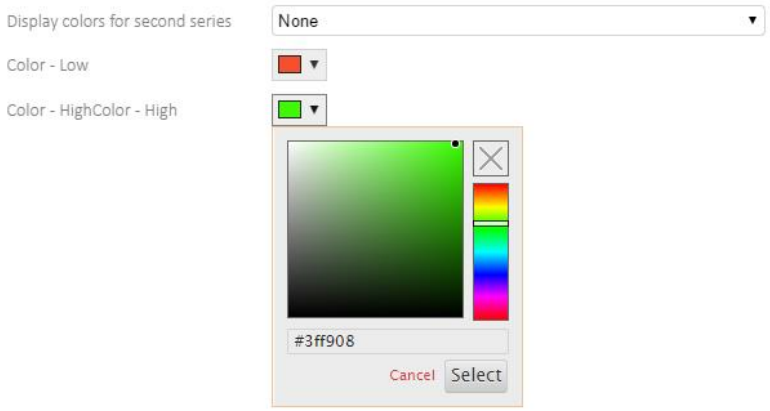


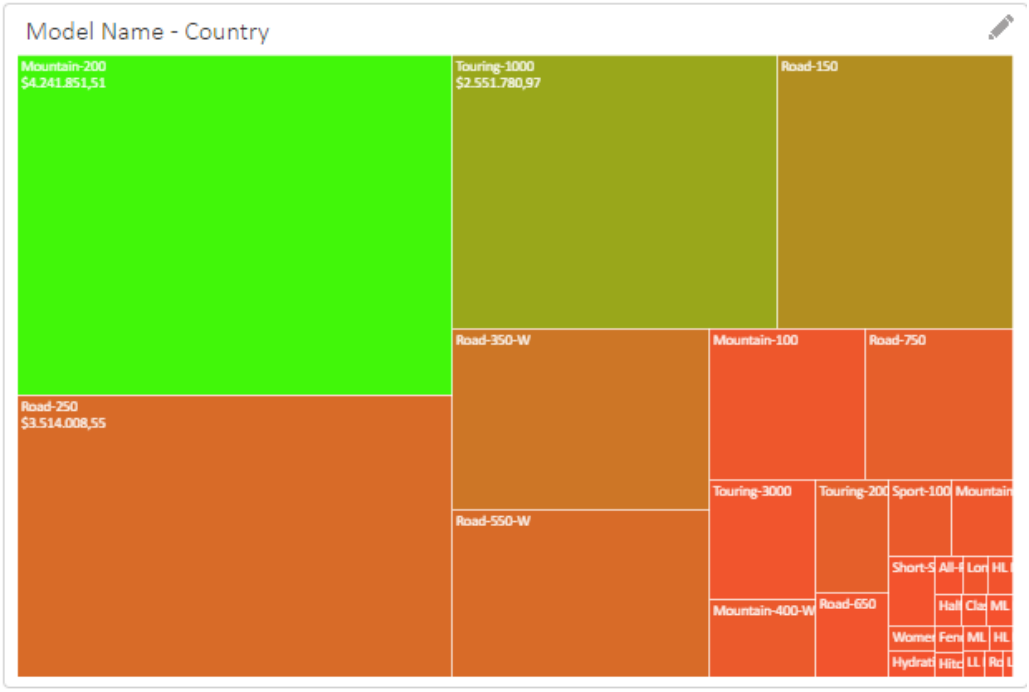
4.8. 'TreeMap' chart

'TreeMap' chart that is used to quickly gain perception of the values and its mutual proportions. There are several options to configure about 'TreeMap' behavior, such is color for 'high' and 'low' values and option to render size based on first series of values and color based on second series, separately.



Edit colors for ‘High’ and ‘Low’ values of the ‘TreeMap’ chart in tile visual options.





TreeMap chart could be configured to display size of items based on first series of values, while displaying color based on second series of values from the data chart is based upon. If data is based upon OLAP data, at any time click on the particular item to use OLAP analytic actions, such is drill-down, drill-through, etc.

4.9. 'Table' chart

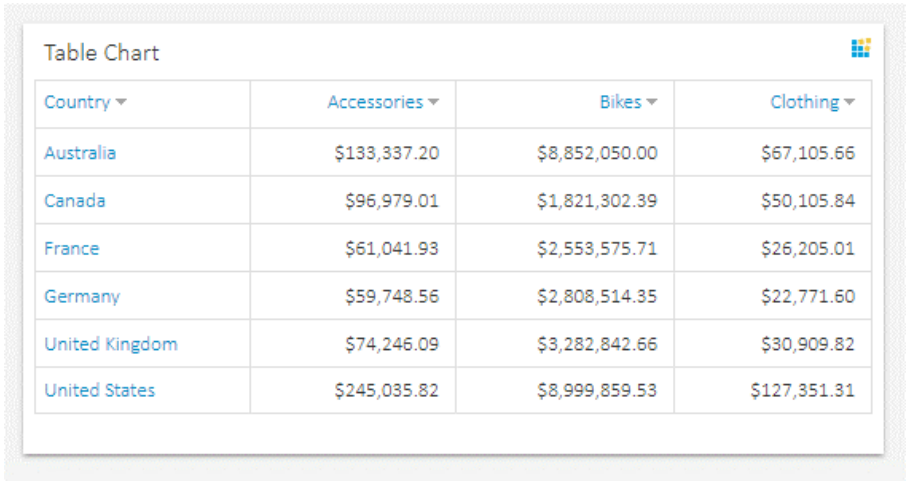
Often usage of data in the form of Table/Grid as most appropriate data insight in many cases, Kyubit Dashboards ensures with additional visualization features that will contribute to simplicity, elegance and focus on relevant details when 'Table' is rendered within the dashboard.

'Table' chart simply renders values from query or analysis with unlimited number of columns and rows and appropriate scroll bars if required. This way any data could be displayed on the dashboard without limitations.

'Table' chart is the only chart that could display 'Any data' query type, which does not have to include numeric values like other charts and could display any data type.

'Table' chart has numerous options to customize its appearance and focus user to relevant points on the chart. Use 'Grid Lines' options to draw horizontal or full grid lines on the table. Set table height, font-size, row height and column width for the table or set for each column individually background-color, fore-color, text-style and alignment to get the most appropriate look of the 'Table' chart on the dashboard. Dashboard 'Table' chart can render any data types from analyses or queries with option to display 'Value Bars' for numeric data types. All defined visual appearance options are also rendered while exporting dashboard to PDF file. If dashboard 'Table' is rendering analysis containing KPI definitions, KPI icons will be displayed automatically.

'Table' chart samples…



Country	Accessories	Bikes	Clothing
Australia	$133,337.20	$8,852,050.00	$67,105.66
Canada	$96,979.01	$1,821,302.39	$50,105.84
France	$61,041.93	$2,553,575.71	$26,205.01
Germany	$59,748.56	$2,808,514.35	$22,771.60
United Kingdom	$74,246.09	$3,282,842.66	$30,909.82
United States	$245,035.82	$8,999,859.53	$127,351.31

Table Chart

Country	Accessories	Bikes	Clothing
Australia	$133,337.20	$8,852,050.00	$67,105.66
Canada	$96,979.01	$1,821,302.39	$50,105.84
France	$61,041.93	$2,553,575.71	$26,205.01
Germany	$59,748.56	$2,808,514.35	$22,771.60
United Kingdom	$74,246.09	$3,282,842.66	$30,909.82
United States	$245,035.82	$8,999,859.53	$127,351.31

Table Chart

Country	Accessories	Bikes	Clothing
Australia	$133,337.20	$8,852,050.00	$67,105.66
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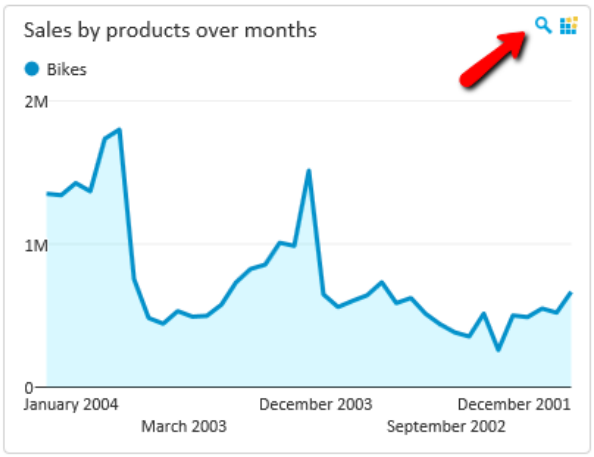
France	$61,041.93	$2,553,575.71	$26,205.01
Germany	$59,748.56	$2,808,514.35	$22,771.60
United Kingdom	$74,246.09	$3,282,842.66	$30,909.82
United States	$245,035.82	$8,999,859.53	$127,351.31

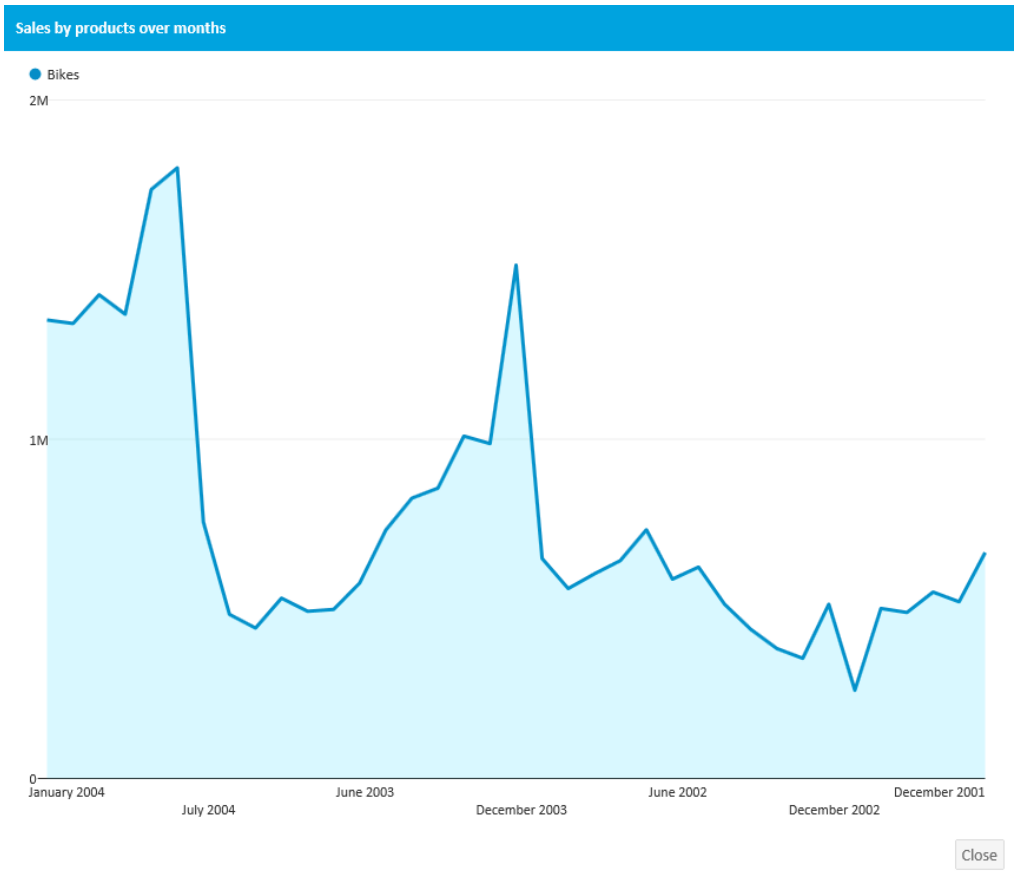
4.10. Enlarged view on dashboard tile

Data visualization on dashboard tile in certain moments is not large enough, for example, for presentation purposes, when focus is on a particular tile.

All tiles have ‘Magnify’ icon that enlarges tile visualization.



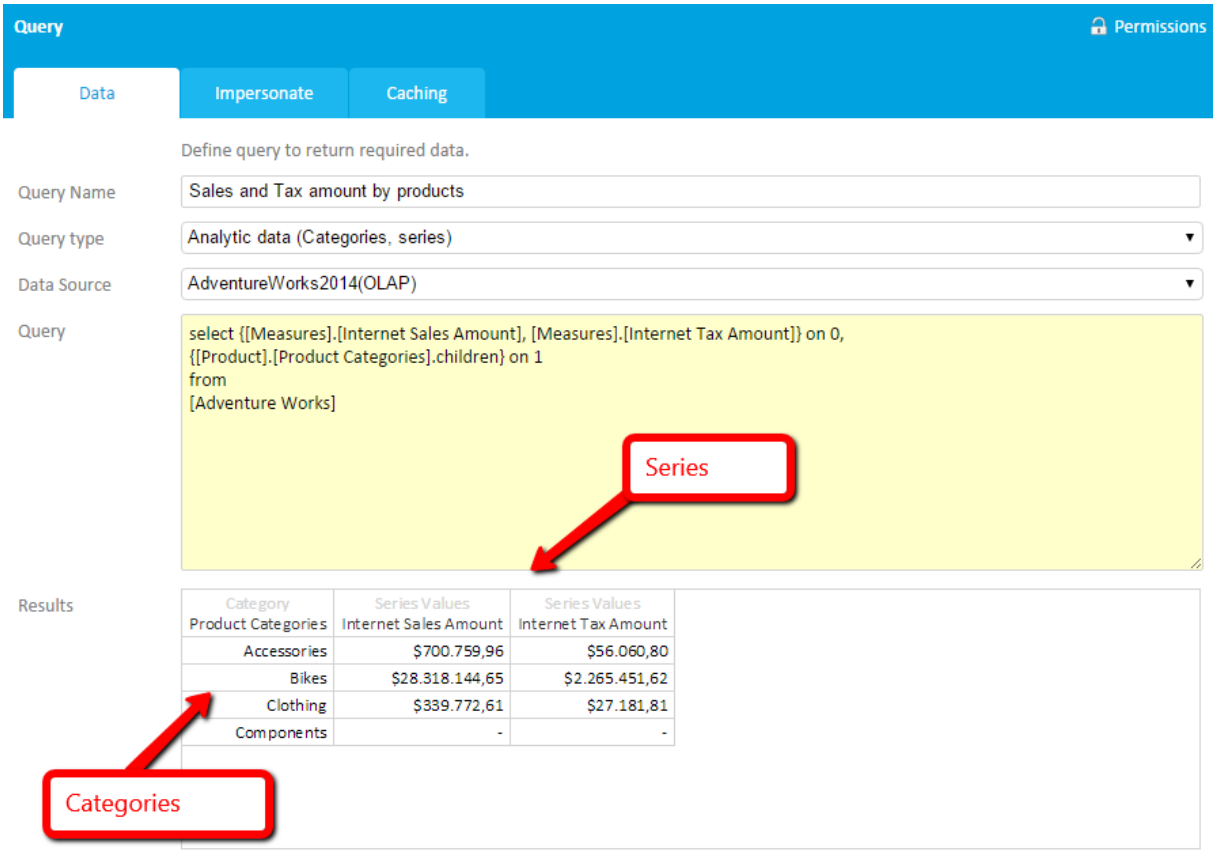
Enlarge action transforms view to single tile visualization on the screen.



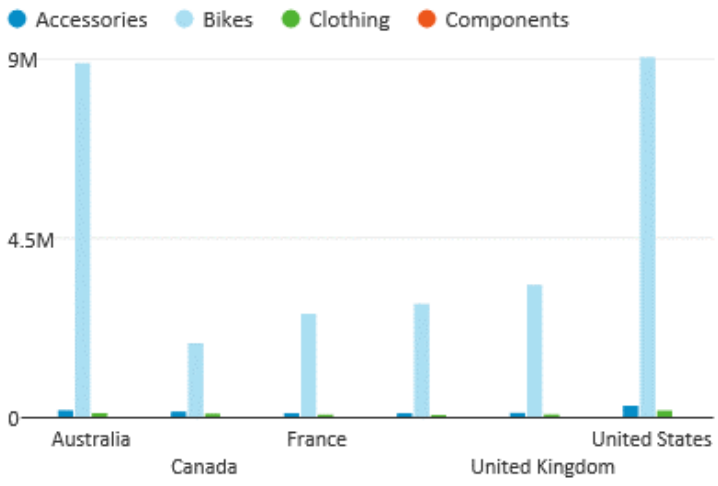
Enlarged view also enables OLAP actions (if data is from OLAP data source) and single point visualization.

4.11. 'MDX query' data for dashboard tiles

While creating MDX query for dashboard tiles, values on column axis presents series, while values on rows axis presents categories. (More information about queries, see '6. Working with queries section')

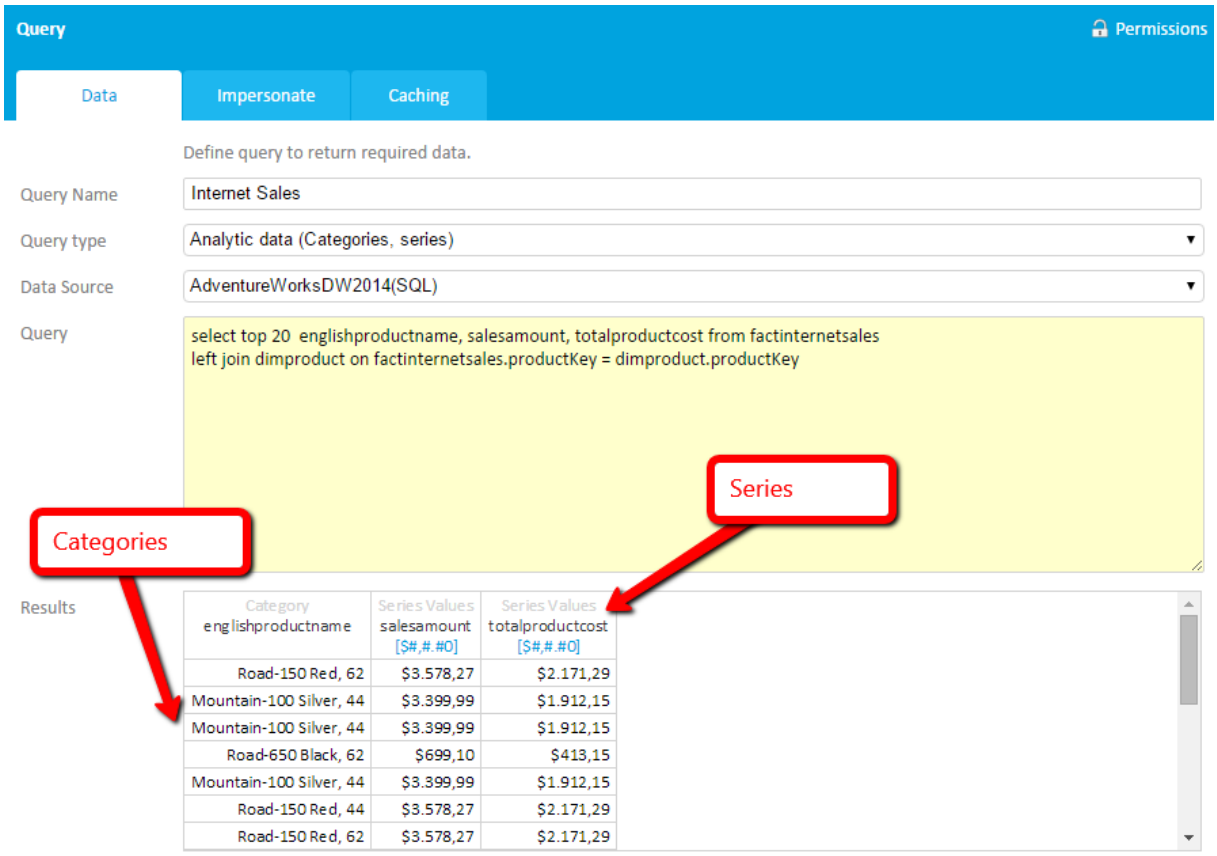


Example of 'Column chart' using above query data…

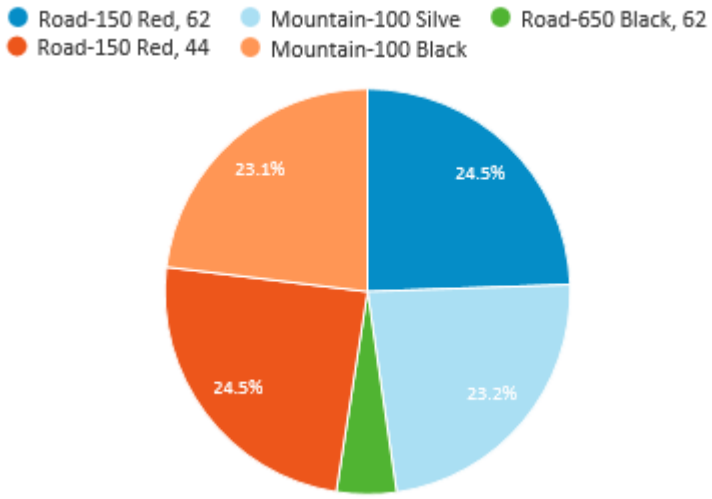


4.12. 'SQL Queries' data for dashboard tiles

While creating TSQL query for dashboard tiles, values on column axis presents series, while values on rows axis presents categories. (More information about queries, see '6. Working with queries section')



Example of 'Pie chart' using above query data…



5. Dashboard layout configuration options

Dashboard and rendered visualizations could be additionally configured to display additional visual and data options. Each dashboard tile has visualization options that are easy to configure to maximize perception of related data.

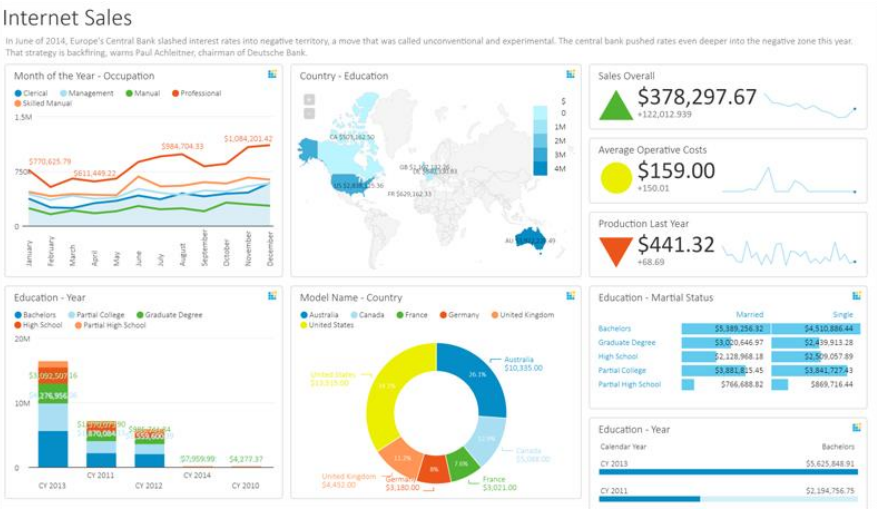
5.1. Color theme pallet

Set dashboard color theme pallet that will be applied to all dashboard tiles or set color pallet for particular tile visualization. By default, all dashboard tiles inherit color theme from dashboard (General Settings) which is by default 'Standard' color theme. While in dashboard 'Design view' user can opt color theme for whole dashboard or set individual tiles color theme. Kyubit product delivers 5 color theme pallets (Standard, Warm, Cold, Strong, Gray), while with some workaround, custom color pallet could be created for the current environment to be available for all users designing their dashboards.

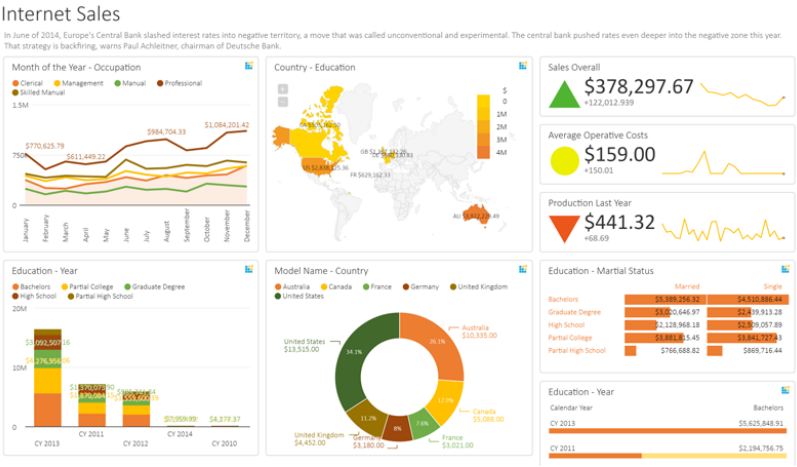
1) To change color pallet for whole dashboard, select 'dashboard design mode' -> 'details' -> 'general' -> select one of available pallets.

2) To change color pallet, select 'dashboard design mode' -> 'tile edit' -> 'options' –> select one of available pallets.

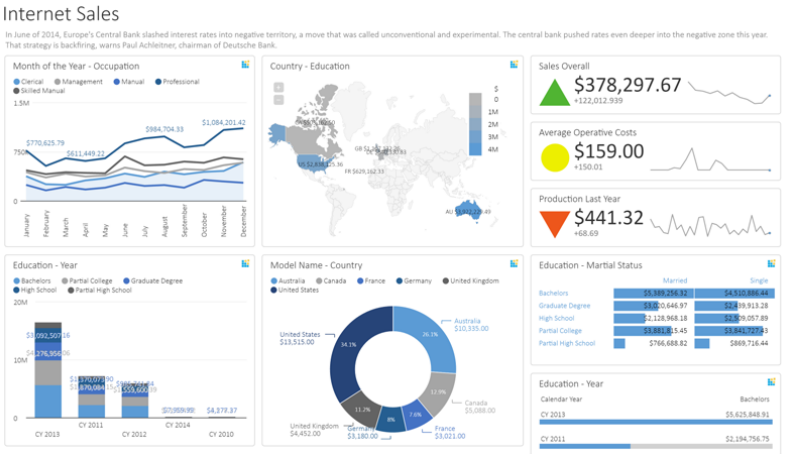
'Standard' color pallet …



'Warm' color pallet…



'Cold' color pallet…



5.2. Create Custom Color Pallet

With some manual workaround it is possible to add your own color pallet that will be available for selection in dashboard design view. To add your color set, follow this steps.

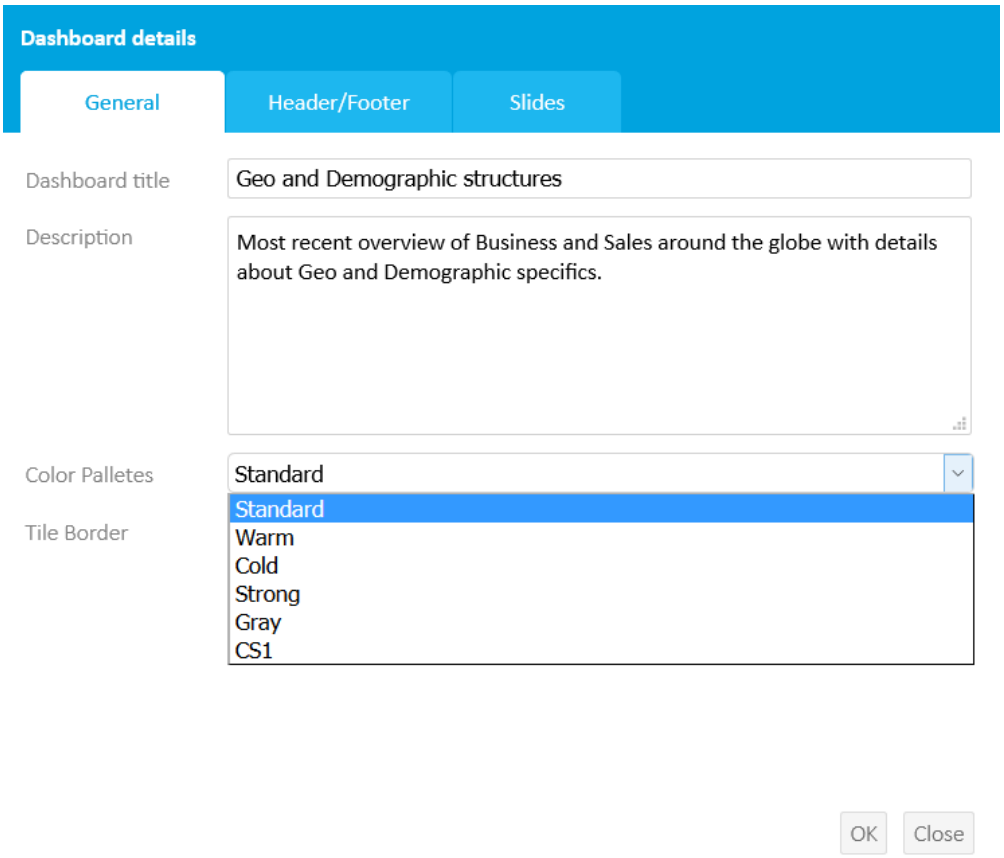
1) Locate file C:\Program Files\Kyubit\BusinessIntelligence\Javascripts**collorPallets.js** (backup existing file)
2) Open file in text editor and add new array of colors to existing sets as on this same picture. Arrays of colors must be delimited with comma. Highlighted is newly added color sequence.

ColorPalletes.js - Notepad

File Edit Format View Help

```
$kyu.colorPalletes=[{Name:"Standard",Colors:"#058dc7 #aadff3 #50b432 #ed561b #ff9655 #edef00 #64e572 #fd91e5
#f10120 #82a75a #08b081 #166609 #70b6a8 #8003b4 #11d496 #efc8ce #46bb2b #5b5f94 #c30475 #c4094f #98f410 #954058
#26d34a #d001cc #33d65e #d349ed #e15b29 #eaa4b0 #804914 #4aba40 #aa03f1 #4efc30 #4d473e #22965e #167709 #133ea5
#4e0051 #fdf926 #7f332f #6f97d1 #9f23f4 #c5e76b #3a3fbf #cacdc4 #89142c #5ac1de #a89128 #154015 #3b0700
#9569b5".split(" ")},{Name:"Warm",Colors:"#ED7D31 #FFC000 #70AD47 #9E480E #997300 #43682B #F1975A #FFCD33 #8CC168
#D26012 #CC9A00 #5A8A39 #F4B183 #FFD966 #A9D18E #843C0C #7F6000 #385723 #F3AA78 #FFD34D #9AC97B #B85410 #B38600
#4E7932 #F6BE98 #FFDF7F #B7D8A1".split(" ")},{Name:"Cold",Colors:"#5B9BD5 #A5A5A5 #4472C4 #255E91 #636363 #264478
#84B4DF #B7B7B7 #698ED0 #327DC2 #848484 #335AA1 #9DC3E6 #C9C9C9 #8FAADC #1F4E79 #525252 #203864 #8CB9E2 #C0C0C0
#7C9CD6 #2B6DA9 #747474 #2C4F8C #ADCDEA #D2D2D2 #A2B9E2".split(" ")},{Name:"Strong",Colors:"#70AD47 #4472C4 #FFC000
#43682B #264478 #997300 #8CC168 #698ED0 #FFCD33 #5A8A39 #335AA1 #CC9A00 #A9D18E #8FAADC #FFD966 #385723 #203864
#7F6000 #9AC97B #7C9CD6 #FFD34D #4E7932 #2C4F8C #B38600 #B7D8A1 #A2B9E2 #FFDF7F".split(" ")},
{Name:"Gray",Colors:"#5F5F5F #B3B3B3 #898989 #212121 #DADADA #AAAAAA #7C7C7C #5F5F5F #B3B3B3 #898989
#212121".split(" ")},{Name:"CS1",Colors:"#5F5F5F #B3B3B3 #898989 #212121 #DADADA #AAAAAA #7C7C7C #5F5F5F #B3B3B3
#898989 #212121".split(" ")}];
```

3) Save C:\Program Files\Kyubit\BusinessIntelligence\Javascripts**collorPallets.js** file and also save it to some other backup place, that will be used to restore same file after upgrade to new version on Kyubit Business Intelligence.
4) Custom color pallet is available for selection for Dashboard color theme or particular Tile color theme.

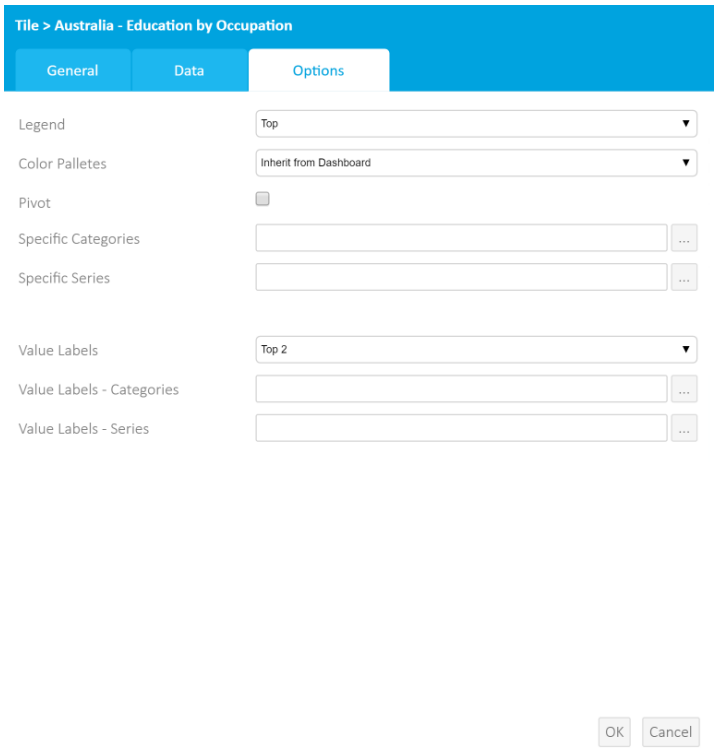


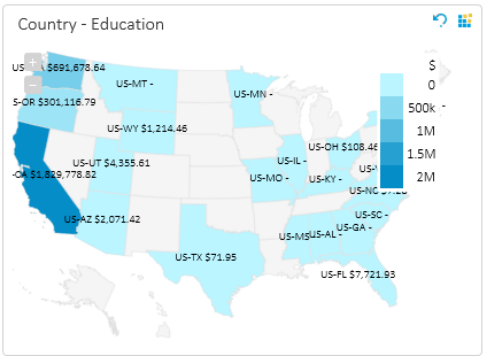
5.3. Value Labels

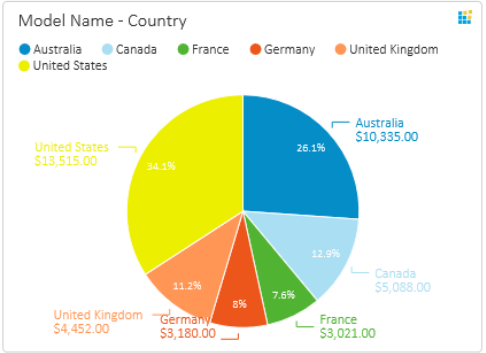
All chart visualization have option to display 'Value Labels', which means that value for particular chart segment will be visible without having to move mouse over it, which is particularly practical while exporting dashboard to PDF file or watching Dashboard tiles on slide show.

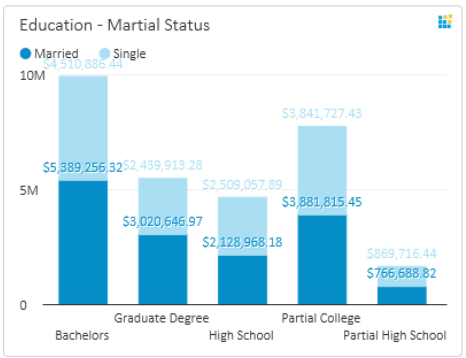
To set 'Value Label' options, follow these steps:

1) Select 'Dashboard Design mode' -> 'Tile edit' -> 'options'
2) Choose 'All' to set 'Value Labels' for all values on the chart.
3) Choose 'Top N' to set 'Value Labels' for highest values on the chart.
4) Choose 'Value Label – Categories' to display 'Value Labels' only for selected categories.
5) Choose 'Value Label – Series to display 'Value Labels' only for selected series.





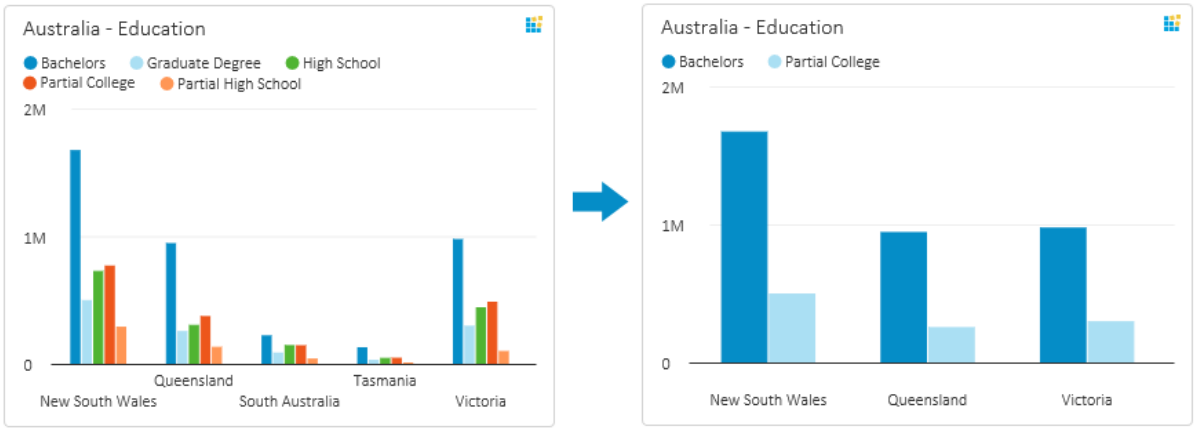




5.4 Show only selected categories/series

OLAP analysis, MDX and SQL queries returns data structures that consist of categories and series to be visualized on the dashboard charts. In dashboard 'Design View' user can select to show only particular categories or series and narrow focus to the data of current interest.

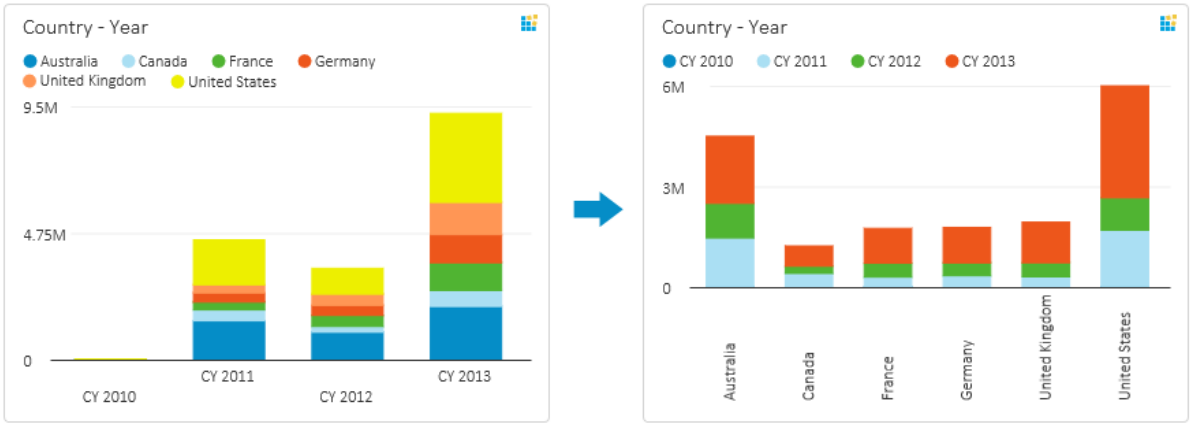
1) Select ‘Dashboard design mode’ -> ‘Tile edit’ -> ‘Options’
2) Choose ‘All’ to set ‘Value Labels’ for all values on the chart.
3) Choose ‘Specific Categories’ to select categories that will be displayed
4) Choose ‘Specific Series to select categories that will be displayed



5.5. Pivot Categories/Series

With one click on the tile 'Options' switch position of categories and series and turn around impression of the data on the chart visualization. Useful feature when returned data from OLAP and SQL sources does not have structure of rows and columns we would like to use on the chart.

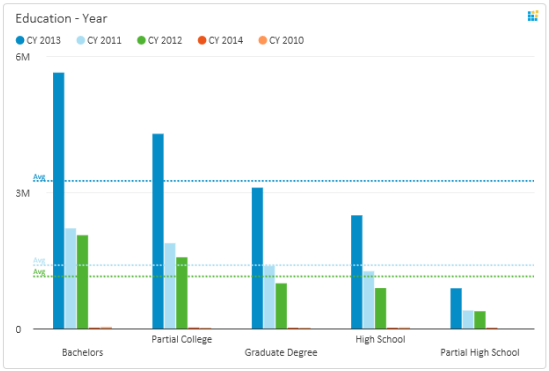
1) Select ‘Dashboard design mode’ -> ‘Tile edit’ -> ‘Options’
2) Mark ‘Pivot’ checkbox, categories and series will switch positions

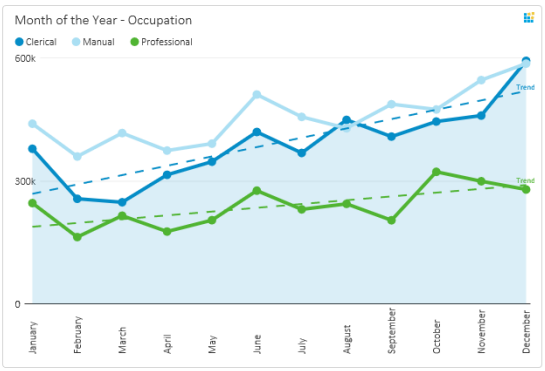


5.6. Show Trend/Average Lines

Select series of the data to calculate and display 'Trend Line' or 'Average Line' on supported chart types (Line Chart, Column Chart, Area Chart and Bubble Chart). 'Trend/Average Line' series are displayed in the same color as selected series of data. 'Trend Line' is based on Linear Trend equation.

1) Select 'Dashboard design mode' -> 'Tile edit' -> 'Options'
2) Select 'Series Trend Line' or 'Series Average Line' pickers to select series for which you would like to display Trend or Average.

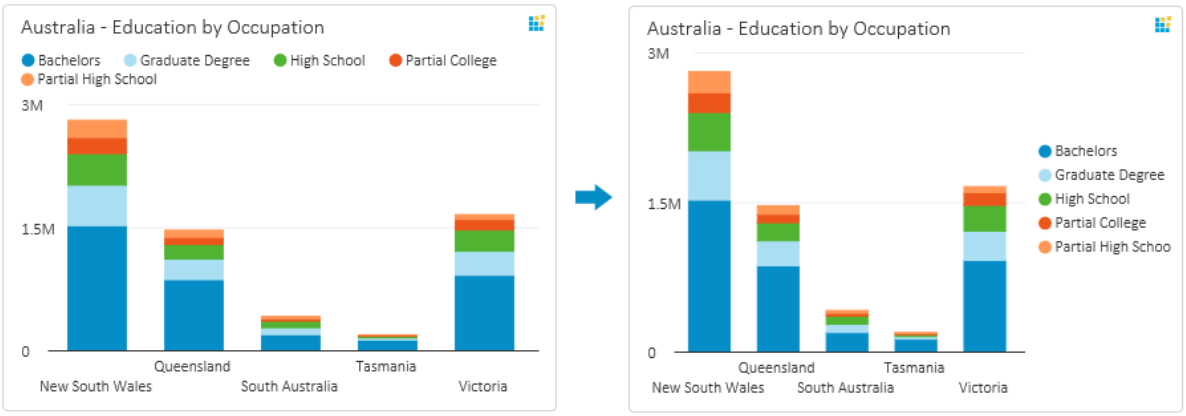




5.7. Legend display and position

Customize appearance of the chart legend on each individual tile on the dashboard. Legend position could be set in tiles 'Options' and could be set to 'Top', 'Right' and 'None' position value.

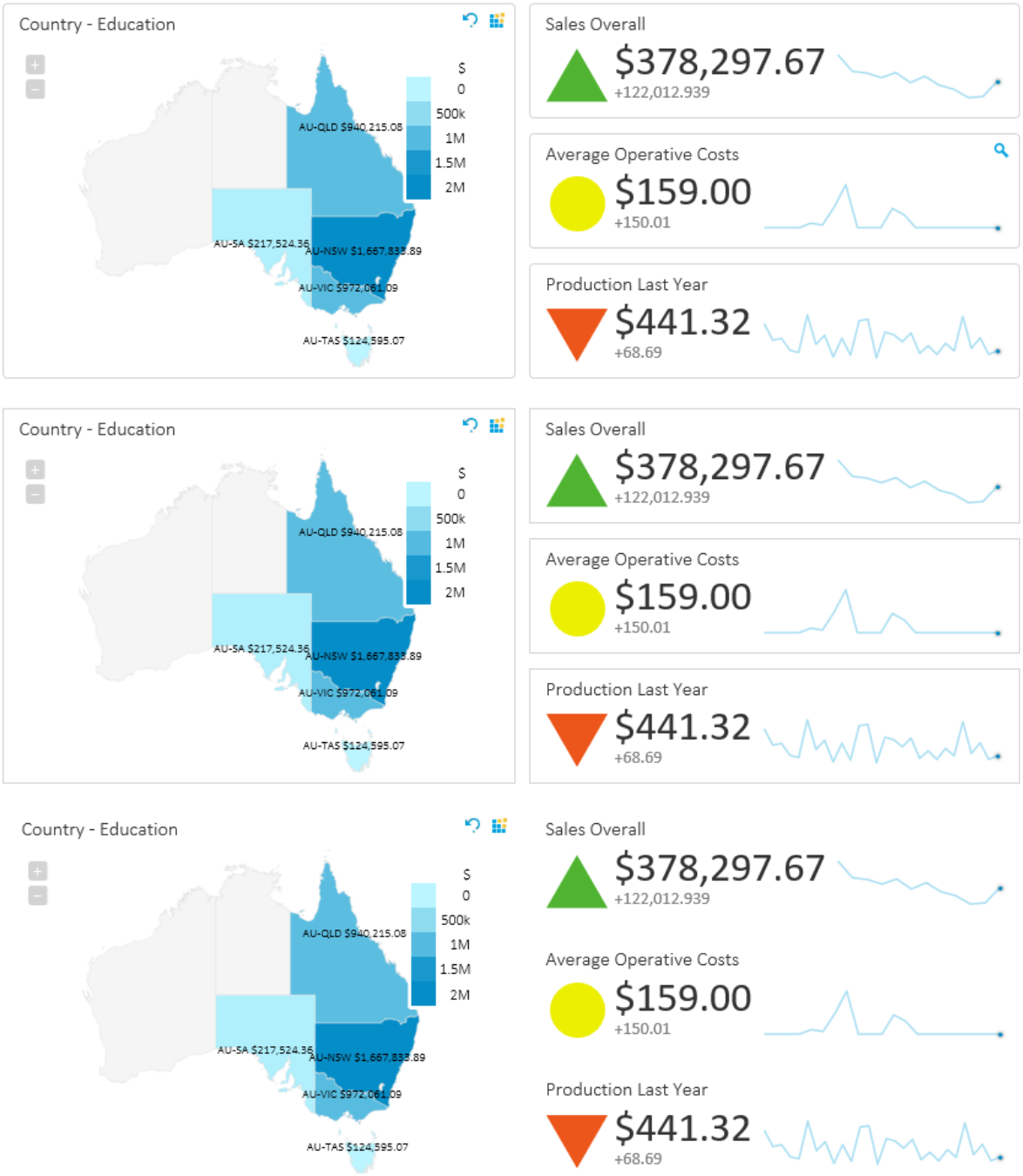
1) Select 'Dashboard design mode' -> 'Tile edit' -> 'Options'
2) Select 'Legend' dropdown and select one of available values.



5.8. Dashboard Tile Border

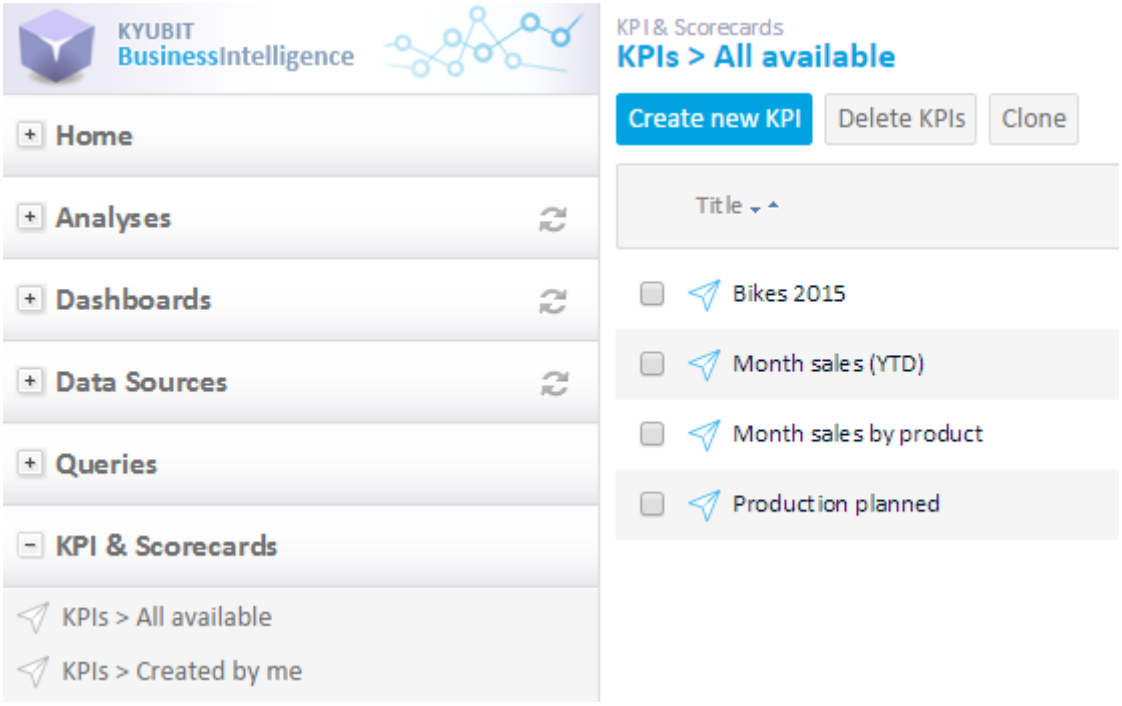
Dashboard tile border is displayed with ‘Rounded’ edges by default. In 'Design View' dashboard 'Details' -> 'General' settings tile border could be set to 'Square' or 'None' borders.

1) Select ‘Dashboard design mode’ -> ‘Details’ -> ‘General’
2) Select ‘Tile Border’ dropdown and select one of available values.



6. Working with KPIs

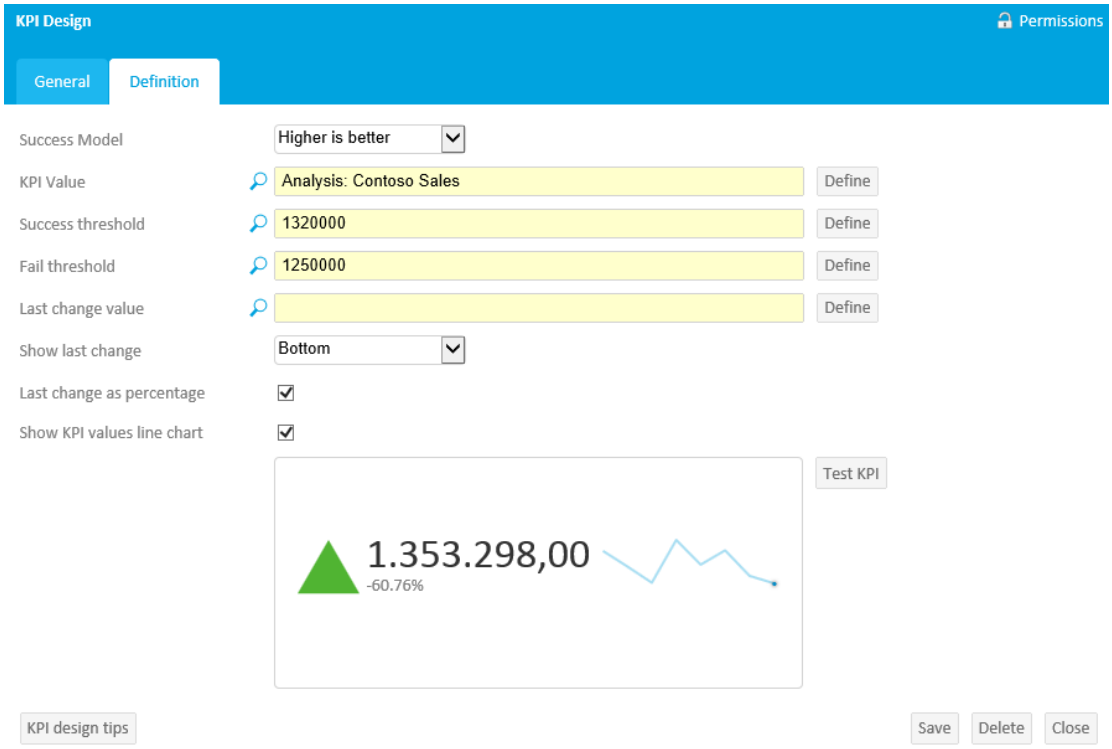
Once created, KPI could be re-used on many dashboards with respect to defined permissions on the KPI. All available KPIs to current user are visible in 'Dashboards' -> 'KPI' section of Kyubit Business Intelligence.



When one of dashboard tiles should display KPI, one must first be defined in the Kyubit Business Intelligence application to be used on dashboard itself. It could be right away created while in dashboard 'Design' view, without leaving working dashboard.

6.1. Designing KPI

'KPI Design' form offers everything on one place to create KPI in Kyubit Business Intelligence application.

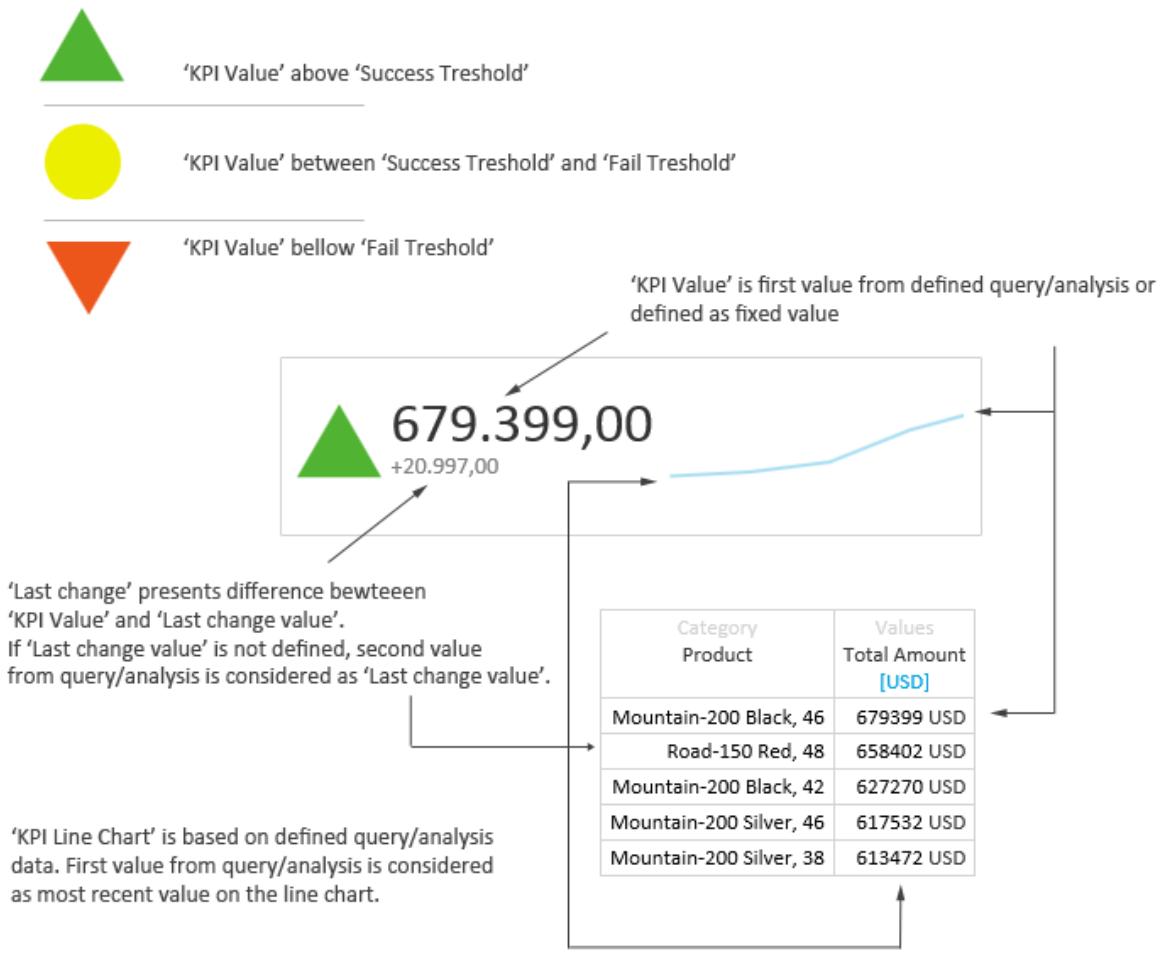


- 'KPI Name', defines full name of the KPI in the system.
- 'KPI Short Name', will be used on places (mobile device), where space is limited
- 'KPI Description', simply described KPI structure for other users.
- 'Success Model', defines if higher values are more successful or lower values are more successful.
- 'KPI Value' is actual value that is tested for KPI success. Could be configured as 'Fixed numeric value' or value from 'Query/Analysis'.
- 'Success threshold', defines limit above KPI status is consider as 'Success' and marked with green arrow icon. Could be configured as 'Fixed numeric value' or value from 'Query/Analysis'.
- 'Fail threshold', defines limit bellow KPI status is considered as 'Failed' and marked with red arrow icon. Could be configured as 'Fixed numeric value' or value from 'Query/Analysis'.
- If 'KPI value' is between 'Success' and 'Fail' limit, KPI is in the 'Even' status and marked with yellow circle.
- 'Last change as percentage', defines if last change will be displayed as percentage or regular delta value.
- 'Show KPI values line chart', defined if line chart will be visible next to KPI to reflect changing of data through time, up to last (current) value. KPI data feed is based on series of values (first series of analysis/query) and last value in series is considered as current value to be evaluated for KPI, previous values are considered as historic and could be displayed as list chart next to KPI indicator.

When all inputs are selected, click on 'Test KPI' to immediately display KPI visualization and perhaps make correction, before it is closed.

6.2. Understanding data usage for KPI design

Data to display KPI comes from 'Analysis' (existing analysis within Kyubit Business Intelligence application), 'MDX Query' or 'TSQL Query'. Value to be evaluated as relevant for KPI is the last value in the first series of values retrieved from analysis or query. All other values before last values are considered as historic supplement of values and are used to describe trend and last value change (delta).



KPI value is first value in first series of query values, other values are used to draw line chart and penultimate value is used to show 'last value change'.

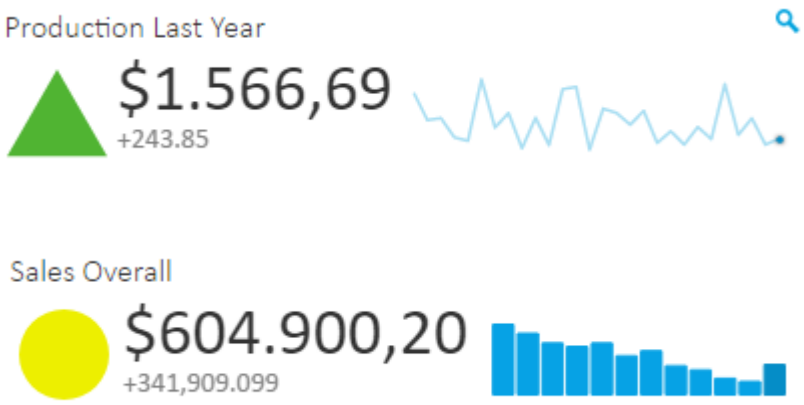
Same principles are used if data is retrieved from 'Analysis' or 'MDX query'.

6.3. Setting permissions for KPI

If KPI should be visible to other users, click on the 'Permissions' options in the upper-right corner and add appropriate Active Directory users and groups to have 'Read' or 'Read/Write' permissions or set unrestricted access to created KPI. (See chapter 7.1. for more details)

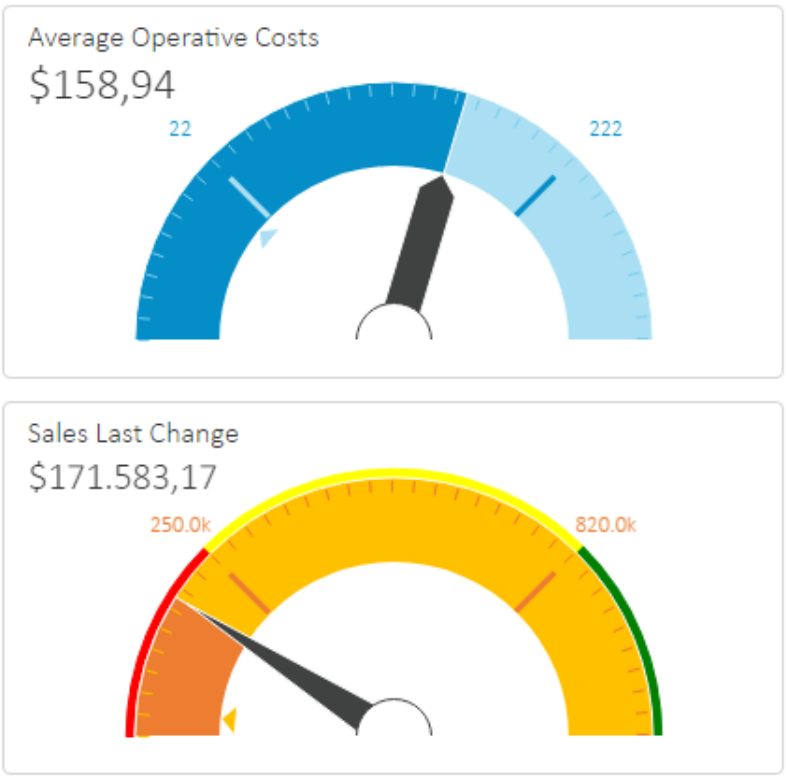
6.4. KPI visualization

Default KPI visualization on the dashboard includes KPI status icon (that quickly describes current KPI status), KPI current value, last values change and last changes of values displayed as small line chart or column chart.



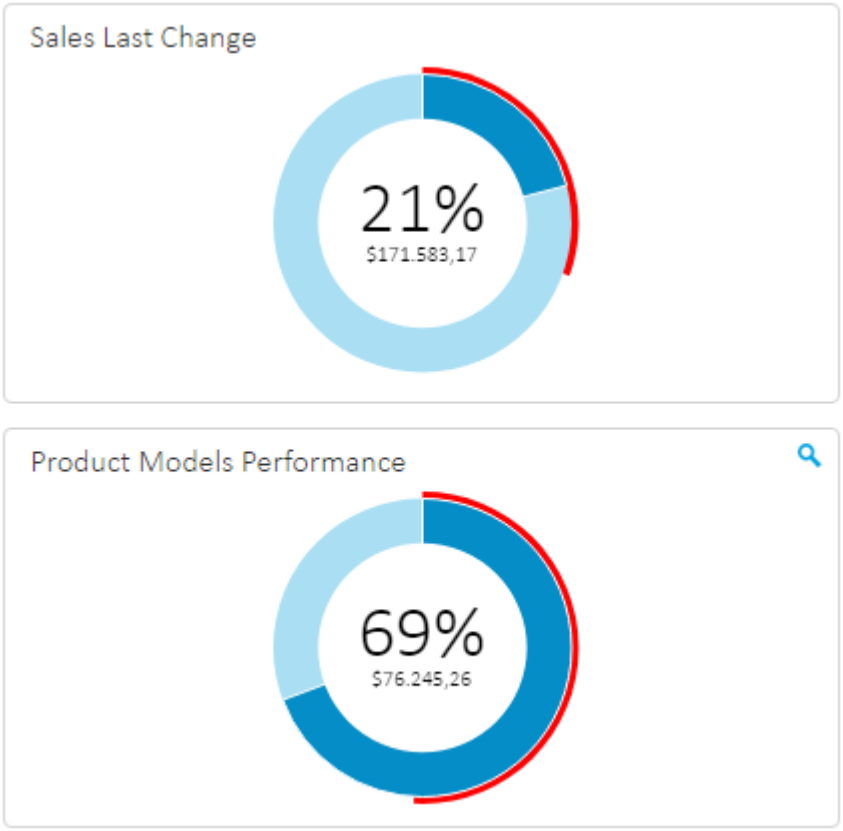
6.5. Gauge KPI visualization

Gauge visualization displays KPI current status with additional insight on how much it takes to meet success or fail threshold that is indicated by pointer on the gauge. Various visualizations options are included to design gauge that suits best to your visualization requirements, which includes colors, various pointer types, display of mini charts, last value indicator and additional color meter on the top. All visualization options could be selected at the tile visualization options tab.



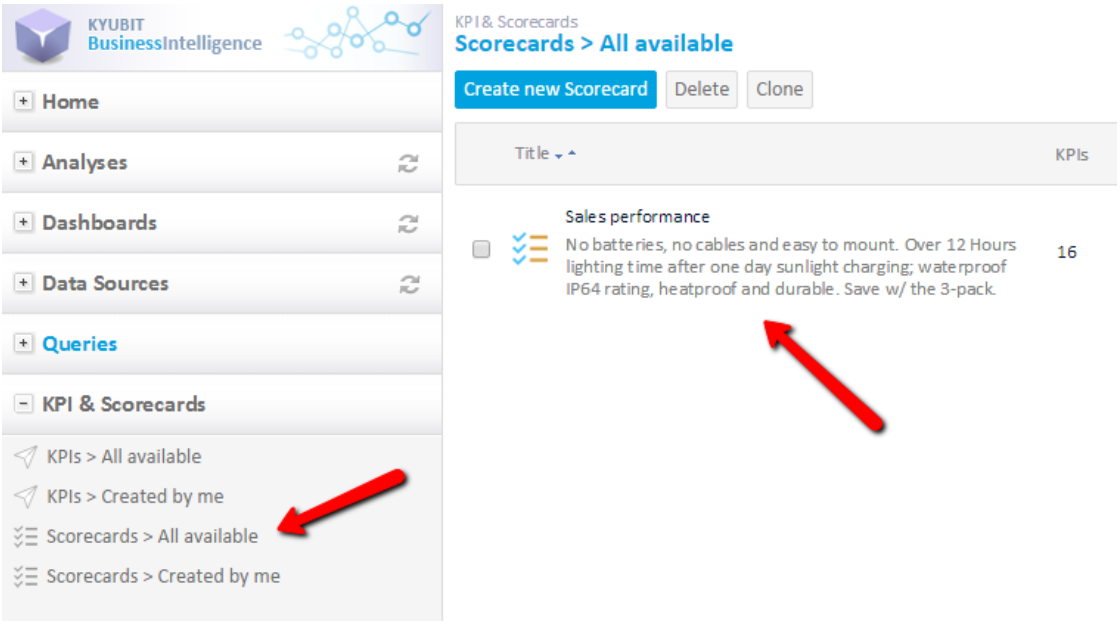
6.6. Goal-Meter KPI visualization

Another way of KPI status display with circle metric showing how much it takes until KPI reach its goal with additional red arc that displays also failure area of the KPI. Simply add Goal-Meter to the dashboard and attach existing KPI to display its status.

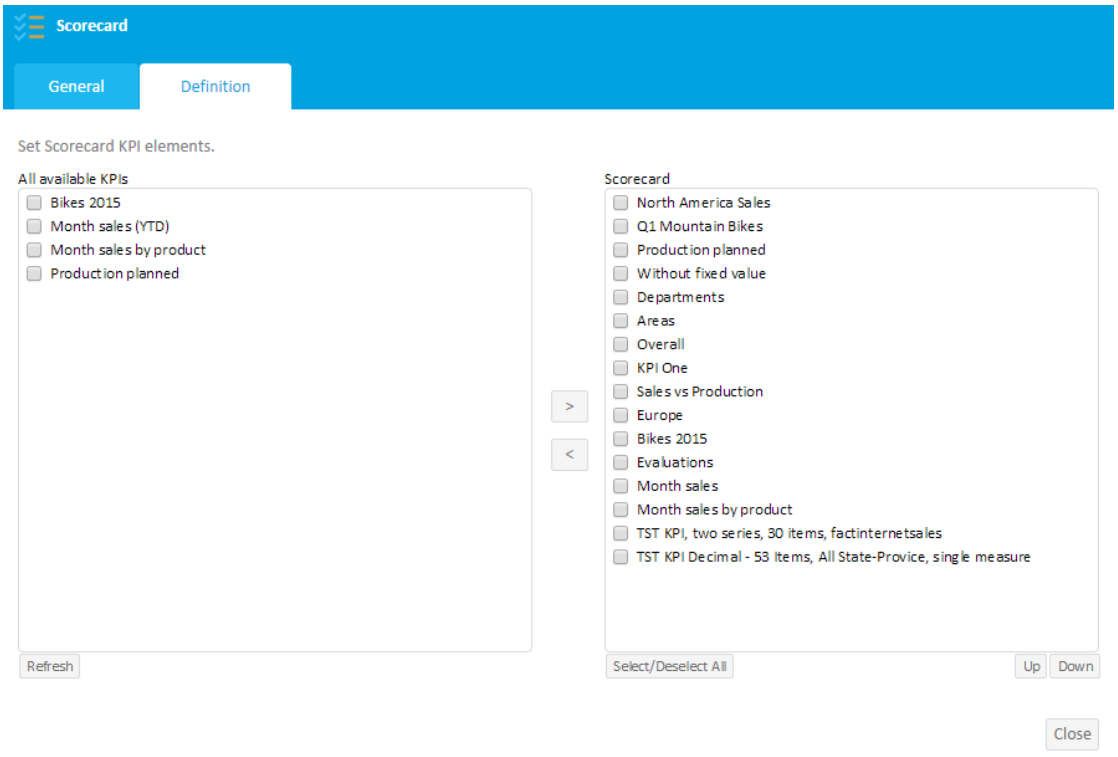


7. Scorecards

Organize multiple KPIs to a list that presents status of all KPIs, targets, indicators, goal percentage on one place on the dashboard. Easy create Scorecard list in the KPI & Scorecard section of the application and assign appropriate permissions.

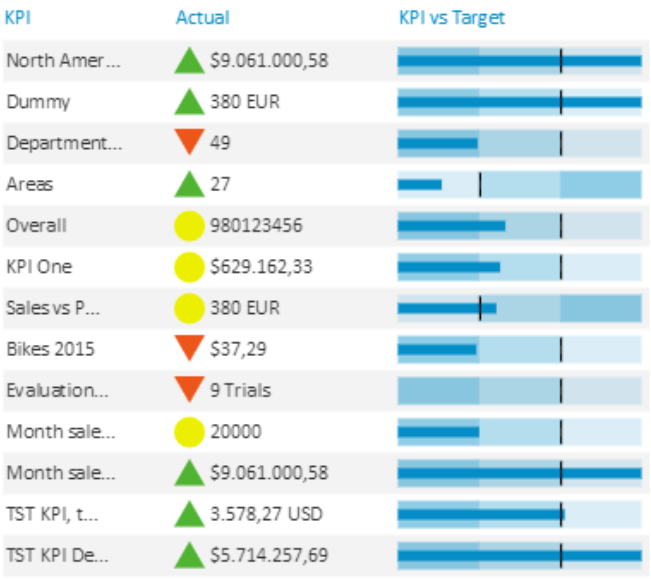


Pick from the list of existing KPIs and arrange order you prefer.

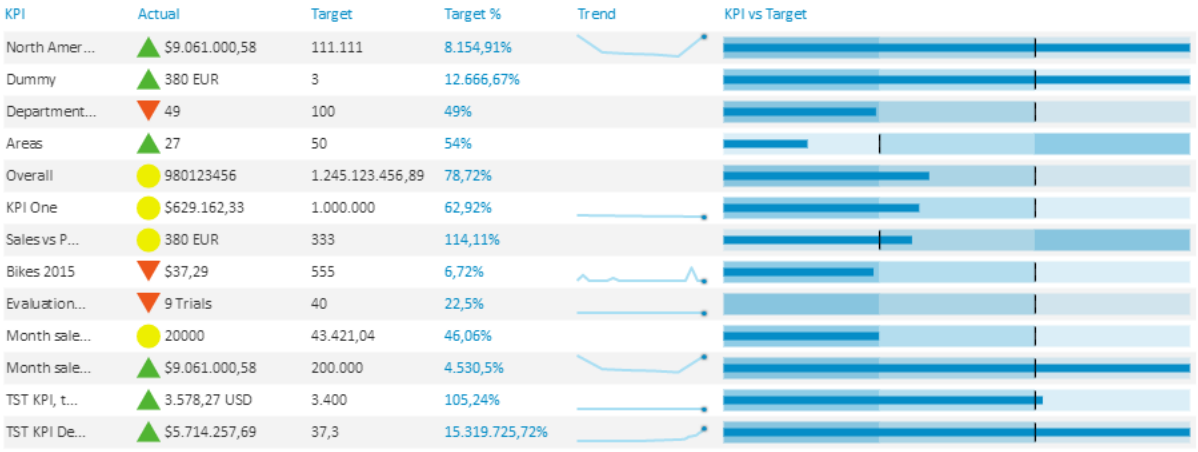


Appearance of the Scorecard on the dashboard depends of the dashboard column width. If there is the place, more details about Scorecard KPIs will be displayed.

Narrow Dashboard Column:



Wide Dashboard Column:

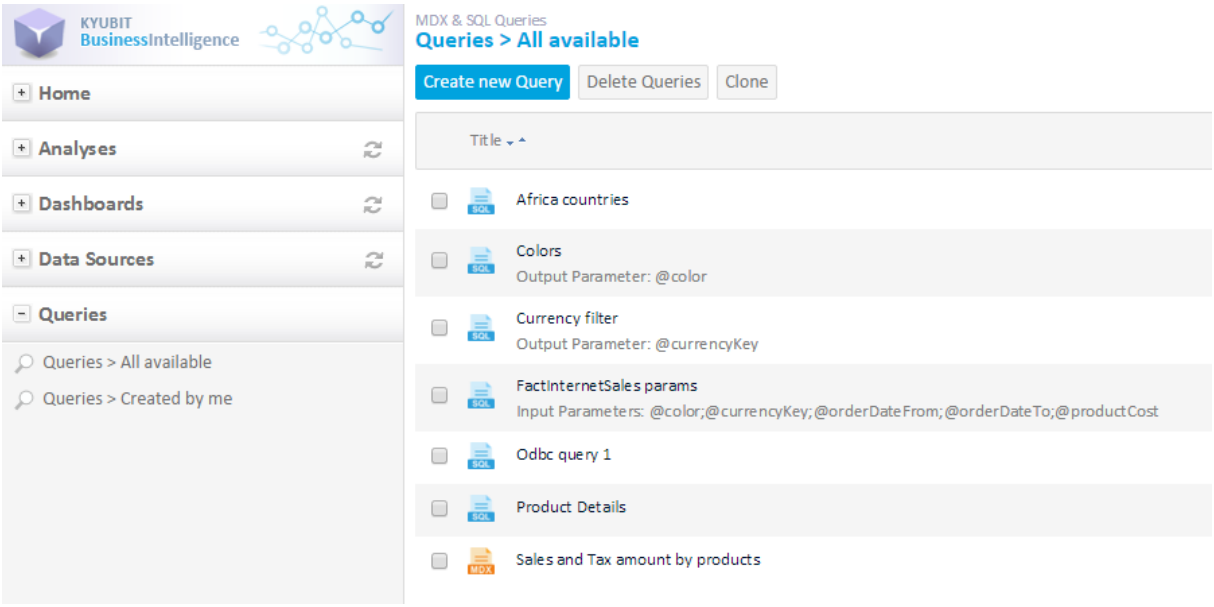


If KPI has 'Short Name' defined, it will be used to display KPI name on the Scorecard, if not first 10 characters of KPI default name will be used.

8. Working with Queries

Data for dashboard tiles comes from 'Analysis' (existing analysis in Kyubit Business Intelligence) or from MDX/TSQL queries. This chapter describes 'Query' creation and some important properties of queries.

All queries available to current user are displayed in Dashboards -> Queries section of Kyubit Business Intelligence. Two query views are available: 'All available Queries' (considering query permissions) and all queries 'Created by me'.



Queries could be MDX queries for OLAP data source or SQL queries for SQL Server or ODBC Data sources that accept SQL query data requests.

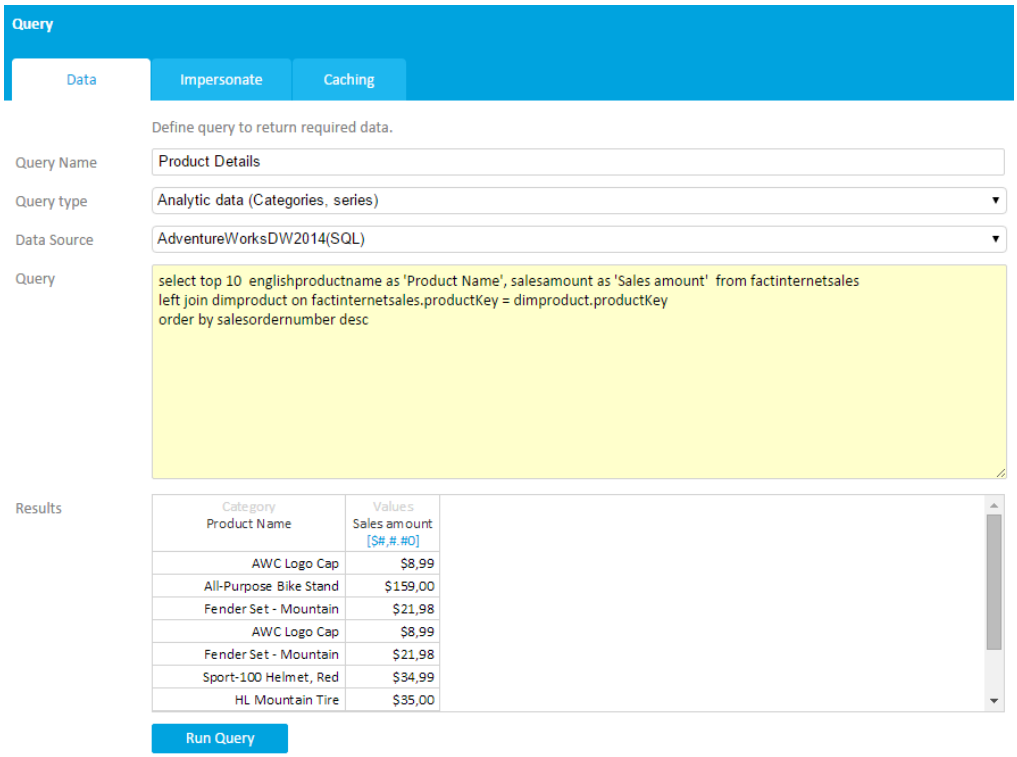
8.1. Creating query

All Kyubit Business Intelligence users could create query using Query design form and Data sources for which they are given permissions.

'Query Type' has two options:

a) **Analytic data**. This form of query consists of Categories and Series. First column defines Categories, while other columns presents Series and must contain numeric values. This form of query is used to present / visualize data on the dashboard.

b) Filter Values. This form of query is only used to list values that would be used as 'drop down' values for SQL filtering on the dashboard. Check section 8.2 'SQL Dashboard filtering' for more details on this topic.



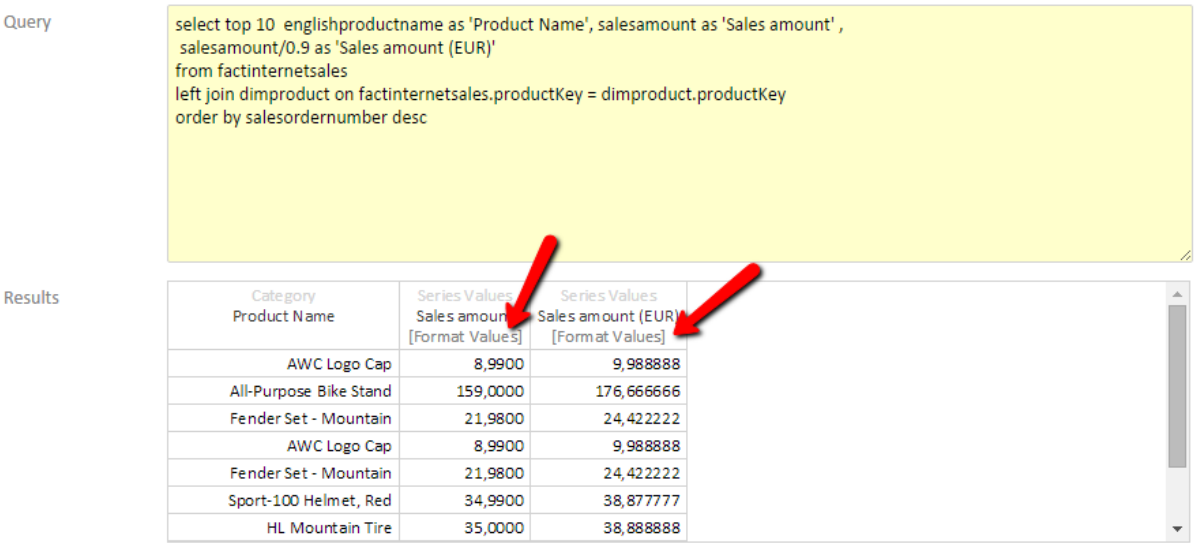
For each query 'Data source' have to be selected. If data source is OLAP database, MDX query will be expected and if data source is SQL database, TSQL query will be expected.

Both MDX and TSQL queries always expect first column as category column with any type of data, while all subsequent columns are considered as series of values and must be of numeric type.

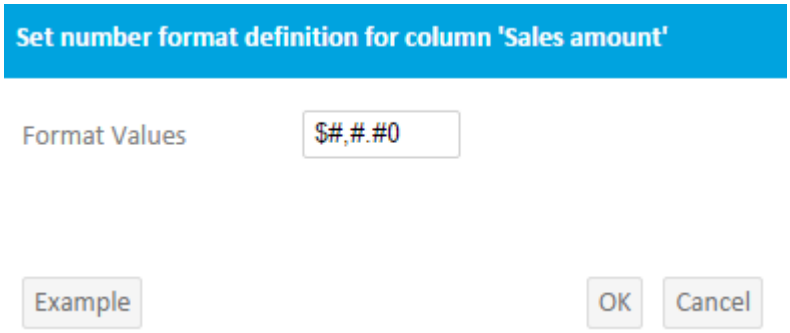
Both MDX and TSQL queries expects at least one series of values (one category and one series columns of data).

8.2. Query values "Format string"

For each of column of query data "Format string" definition could be defined to present data in appropriate manner to end users.



Click on the column ‘Format string’ option and fill-in measure format string for selected column.



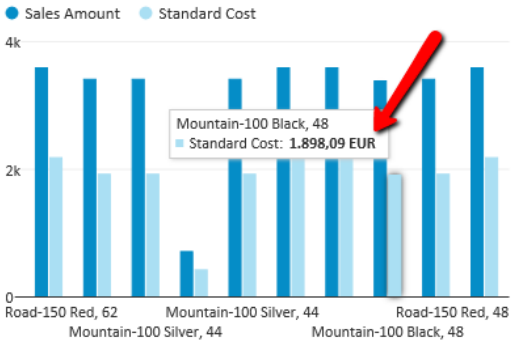
To get required number format output for data usage.

Category Product Name	Series Values Sales amount [$#,#.#0]	Series Values Sales amount EUR [€#,#.#0]
AWC Logo Cap	$8,99	€9,99
All-Purpose Bike Stand	$159,00	€176,67
Fender Set - Mountain	$21,98	€24,42
AWC Logo Cap	$8,99	€9,99
Fender Set - Mountain	$21,98	€24,42
Sport-100 Helmet, Red	$34,99	€38,88
HL Mountain Tire	$35,00	€38,89

Examples of “Format string” for number **123456.789**

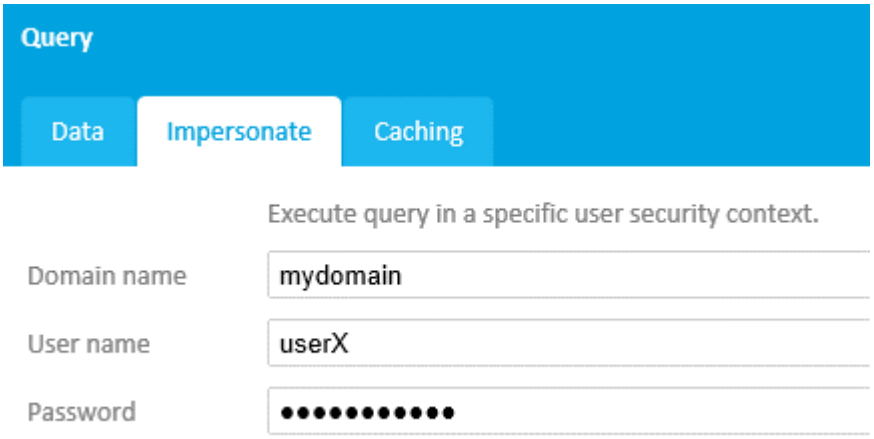
$#,#.##	=>	$123.456,78
€#,#.##	=>	€123.456,78
#.## USD	=>	123456,78 USD
#,#.#	=>	123.456,7
#,#.###	=>	123.456,789
#,#.###0	=>	123.456,7890
#,#	=>	123.456

Same measure unit will be displayed wherever this query is used on any of the dashboard visual elements (tiles).



8.3. Impersonate query execution

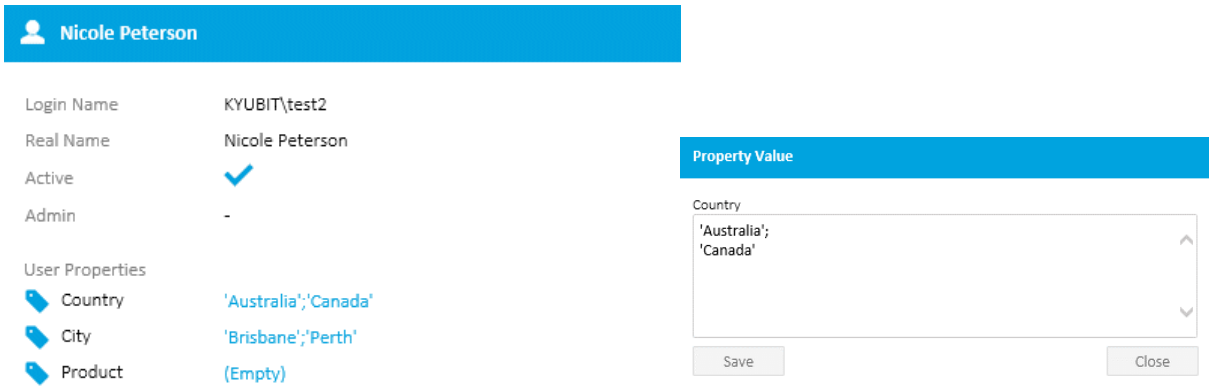
By default, query will be executed in the context of current user. If for any reason data source needs to be accessed with different user credentials. Impersonate user credentials could be defined on 'Impersonate' tab on the query design form.



8.4 User Properties as query additional filters

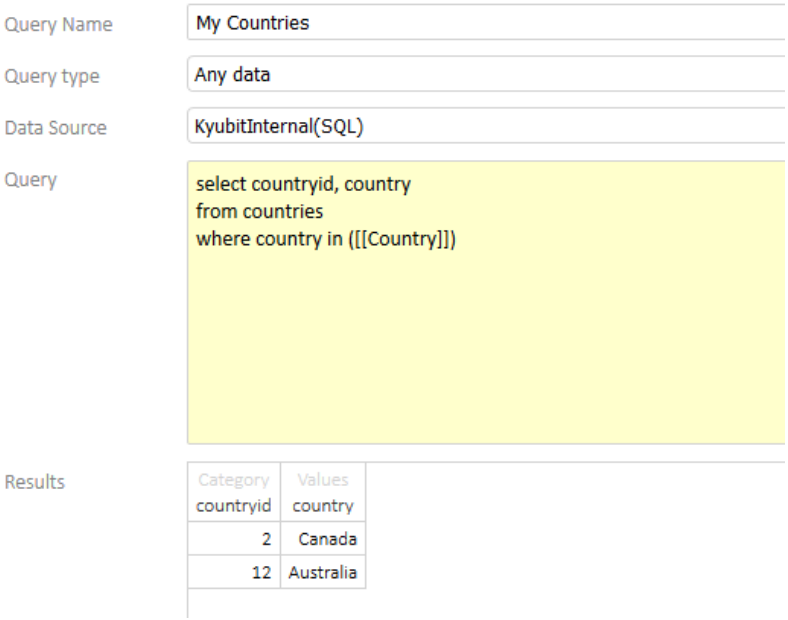
Query could be filtered using current user properties to show data of interest for current user. User properties are Login Name, Real Name of current user or custom created user properties that could be assigned and changed by the Kyubit administrator.

To create and manage user properties, Kyubit Administrator should navigate to Administration -> 'Users and Admins', create new custom user properties and click on each user to assign his custom property values.



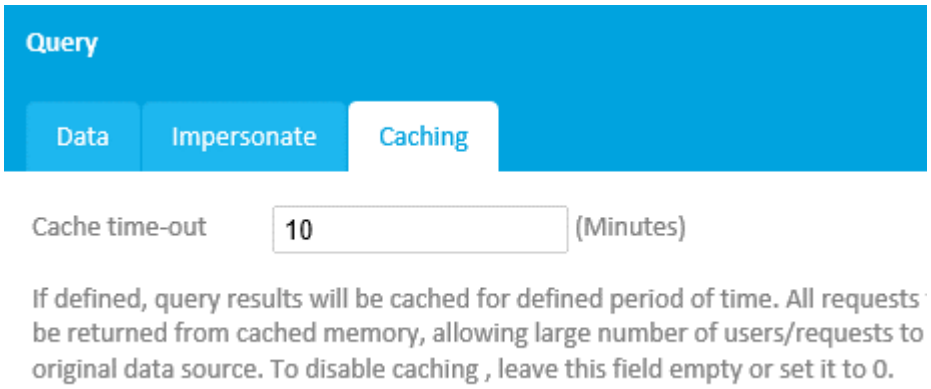
'User Properties' could be used to filter Analyses, Queries and Dashboards.

To add 'User Property' as query, add 'User Property' name with double square brackets to your SQL or MDX query.



8.5 Query caching

Query results could be cached to avoid production data sources from constant query execution and save their processing time. Imagine hundreds of users opening same dashboard and for each opening queries to underlying data sources executes each time dashboard is opened. That kind of query execution is unnecessary in most scenarios and caching queries for certain amount of time perfectly good for most dashboard scenarios. To set caching on certain query, open query design form and on 'Caching' tab set number of minutes for which query results will be cached.



Query results are cached on two levels. First, query results are cached on ASP.NET level within Kyubit Business Intelligence application memory. If, for any reason, IIS is restarted or application is recycled within IIS execution, query results are stored in Kyubit Business Intelligence internal database. In both cases, cached query results will expired after defined amount of time and original data source will be queries afterwards.

8.6 Setting Query permissions

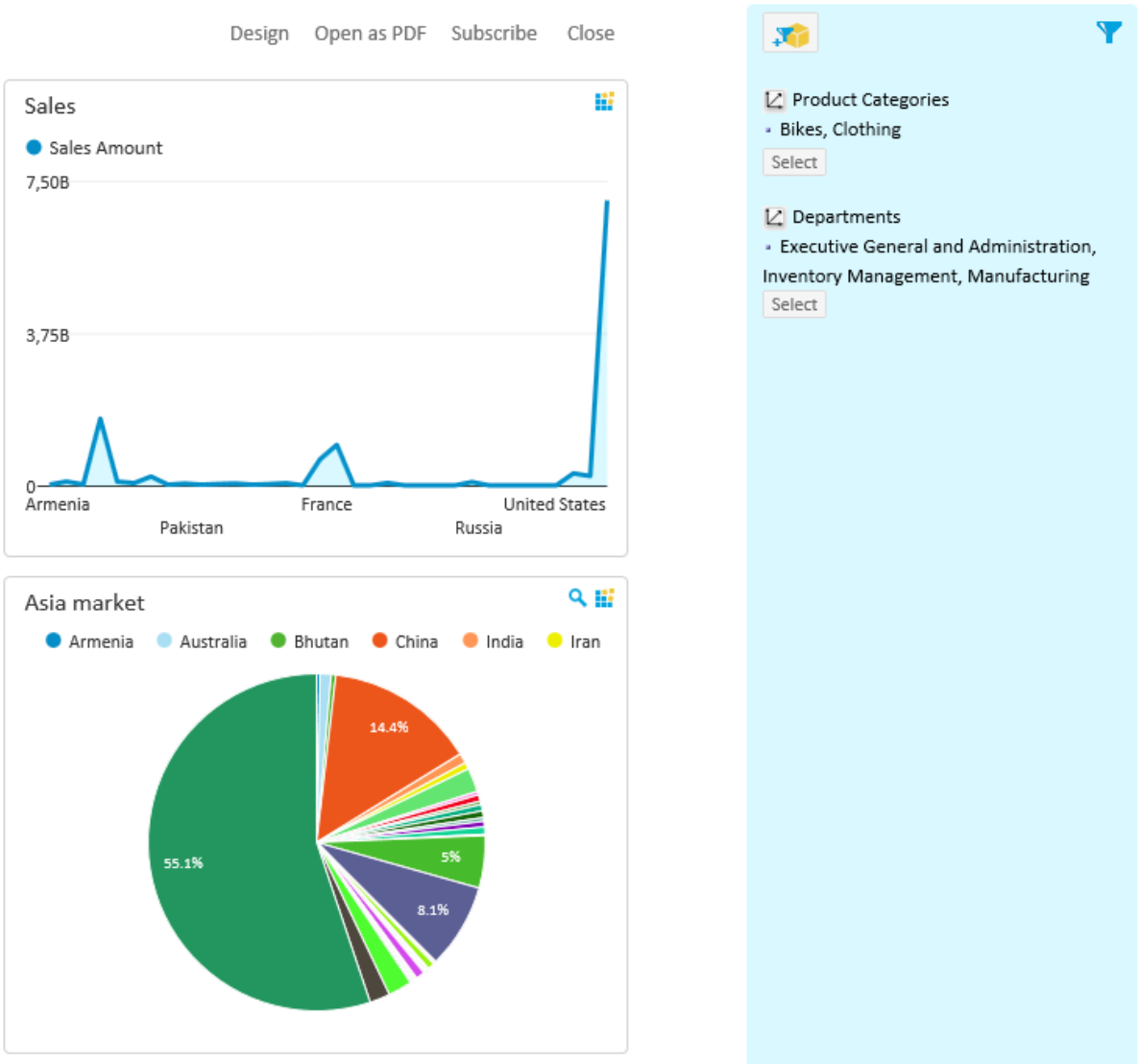
If Query should be visible to other users, click on the 'Permissions' options in the upper-right corner and add appropriate Active Directory users and groups to have 'Read' or 'Read/Write' permissions or set unrestricted access to created Query. (See chapter 7.1. for more details)

9. Dashboard slicers and analysis within dashboard

9.1. OLAP Slicers

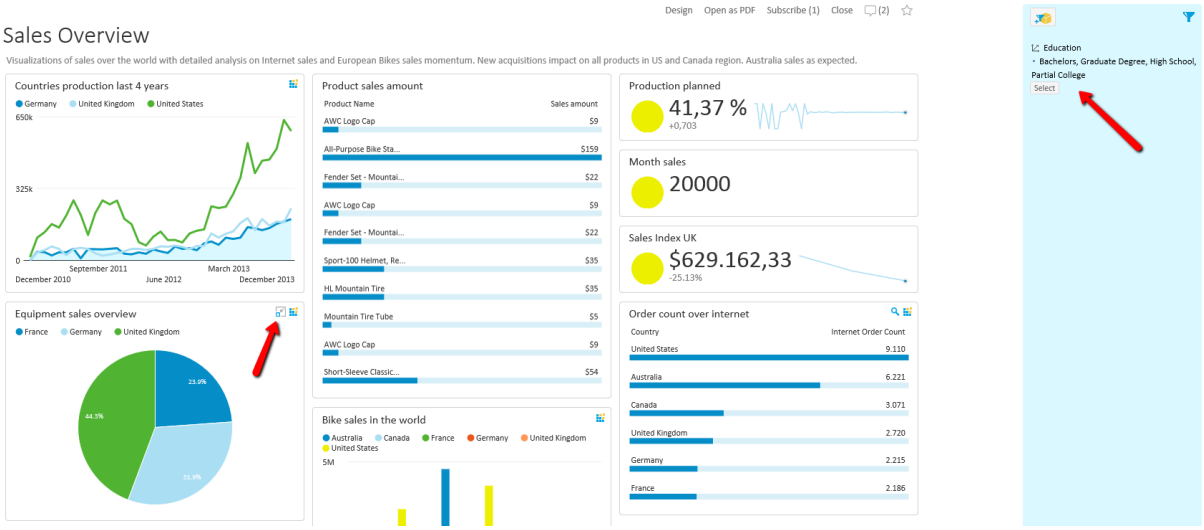
All data on dashboards that is based on OLAP data source could be manipulated with OLAP data slicers that could be added in design or production time. If slicer is added in design time, it will be part of the dashboard whenever dashboard is opened. Also users who are not dashboard designers, but only use dashboard could also add dashboard slicer that will be only a temporary supplement to the dashboard.

Adding slicer for certain OLAP data source will automatically filter (refresh) all tiles based on same OLAP data source with slicer dimension members. Slicers could be additional changed, reordered and removed to provide fine analysis tool while exploring OLAP data.

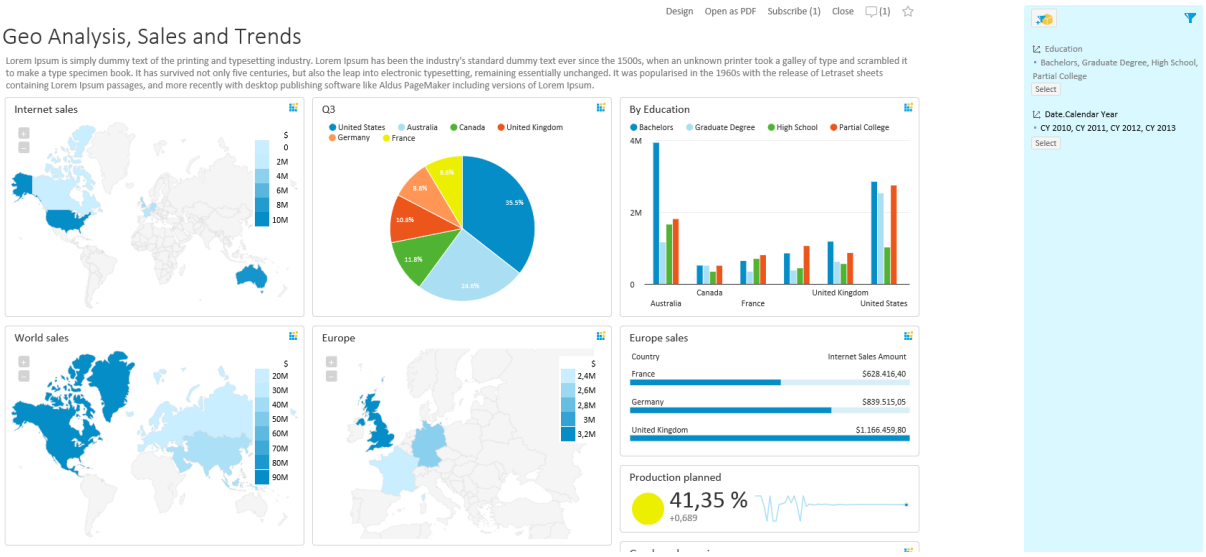


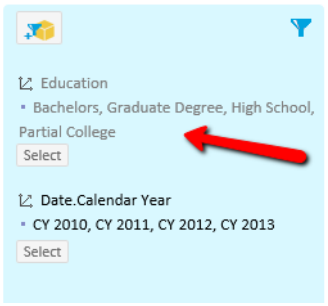
9.1.1. OLAP filters inheritance to child dashboards

Dashboard could contain tiles that have 'Child dashboard' configured to open. If parent dashboard have OLAP filters defined, opening 'Child dashboard' will pass (inherit) all OLAP filters from parent to child dashboard.



Child dashboard has gray OLAP filters that are inherited by opening from parent dashboard.

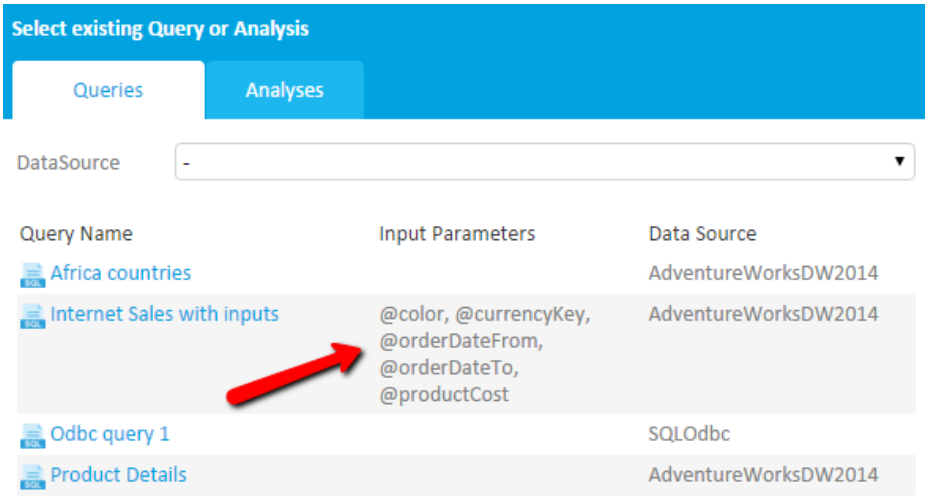




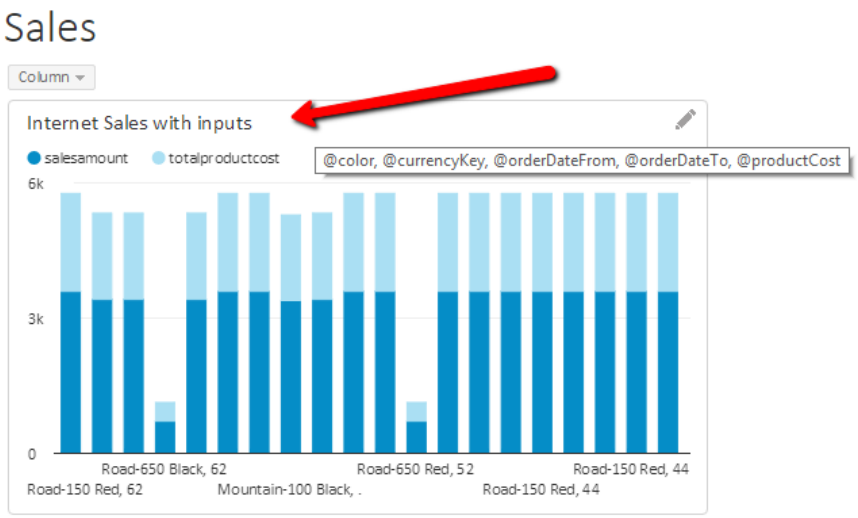
9.2. SQL data filtering

Data on dashboard could also be filtered by adding SQL data filters. For this concept to work, SQL Queries with 'Input parameters' have to be created that requires some basic SQL knowledge (see 8.2.1 Creating SQL queries with 'Input parameters'). Once you get dashboard chart that is based on SQL query with 'Input parameters' you can add SQL filters that would filter / slice data on the dashboard. SQL Filters could be static 'Numeric' and 'Date Time' input fields, or they could be drop down list of values that comes from SQL queries defined as 'Query Type' = 'Filter values'.

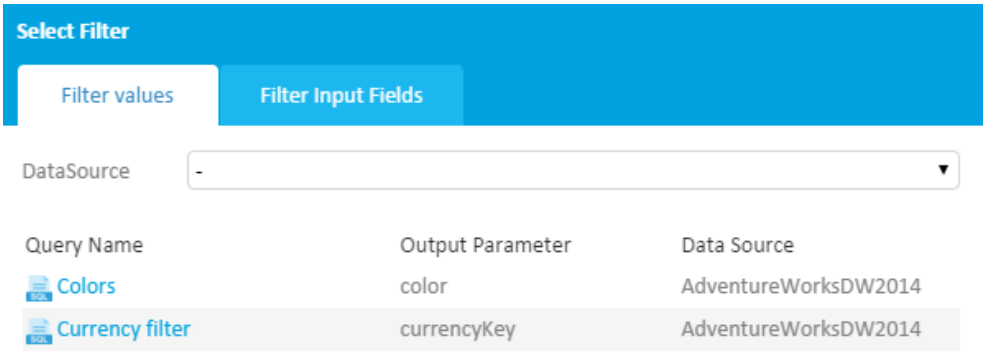
While selecting query for visualization on the dashboard, user can see if created query accepts 'Input parameters'.



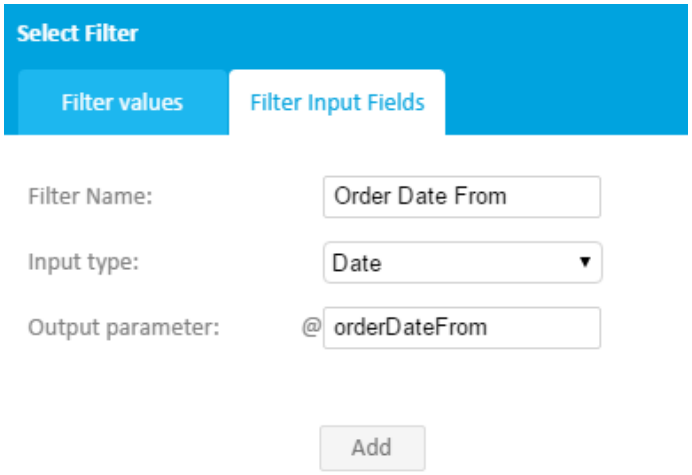
After adding query to dashboard visualization in design mode, moving mouse over tile title will display 'Input parameters' this visualization accepts. Now, this dashboard tile visualization is ready to be filtered.



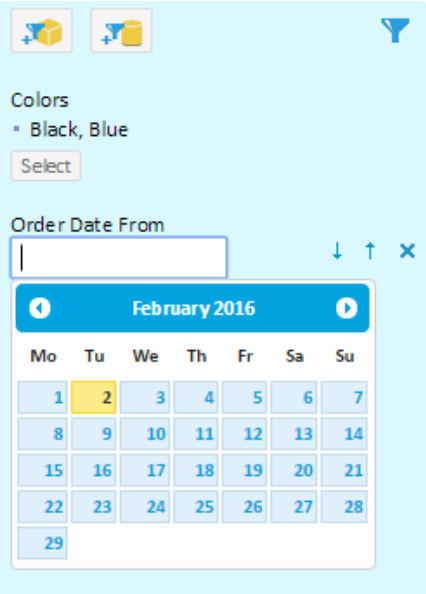
Adding SQL filter will show dialog to choose another query that returns drop down list of values that would be used to filter data or to select static input field that would be used for filtering. 'Number' or 'Date Time' filter type.



(Selecting query for drop down list of values for filtering. Filter will be applied only to visualizations with same 'Input parameter' name as defined of query filter.)



(Select input field that will be used for SQL filtering. Filter will be applied only to visualizations with same 'Input parameter' name as defined for 'Output parameter' on this input field).



(Added SQL filters appear on the slicer panel with option to change filter values)

Applying SQL filters immediately show sliced data for the dashboard tiles with 'Input parameters' that match added filter 'Output parameter' name.

9.2.1. Creating SQL queries with 'Input Parameters'

To create SQL query with 'Input Parameters' some basic SQL knowledge is required for query manipulation. For example, following query…

```
select top 20 englishproductname, salesamount, totalproductcost from factinternetsales left join dimproduct
on factinternetsales.productKey = dimproduct.productKey
```

… returns values without option to be filtered in dashboard.
Now, we would like to have ability to filter products based on "color" input.

```
declare @color nvarchar(50)=null
select top 20 englishproductname, salesamount, totalproductcost from factinternetsales
left join dimproduct on factinternetsales.productKey = dimproduct.productKey
where
(@color is null or color in (@color))
```

… and now we have SQL query with 'Input parameter' @color.

Important

1) Declared variable must end with '=null' *(like in above sample)*
2) In 'Where' clause, referenced variable must be in brackets '(@color)' *(like in above sample)*

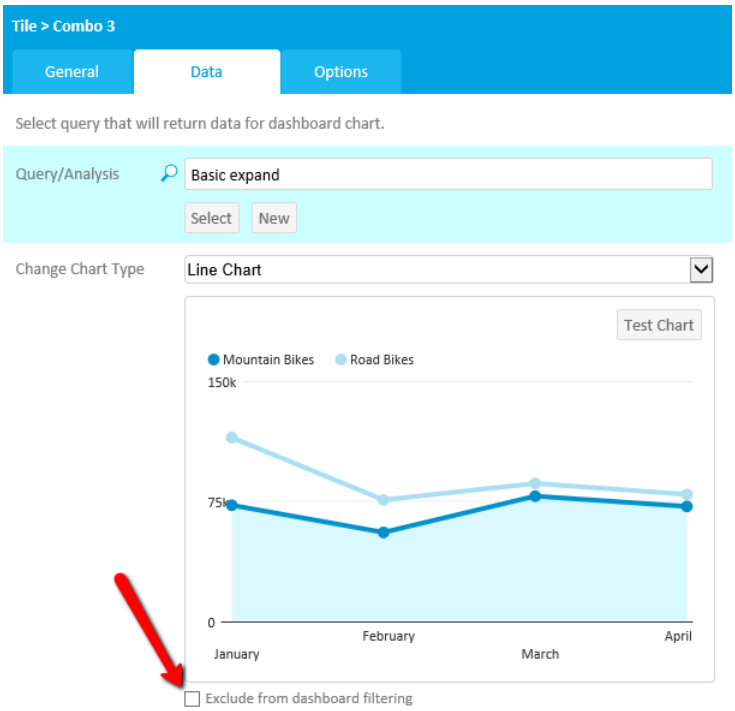
We have added on the beginning of the query, declaration of input parameter and its type and used it after "where" clause in SQL statement as a filter for 'color' table column. Adding parameters on this way guaranties that query will be successfully executed, if parameter is not used and if it is used it will be applied as a filter.

Example, of multiple output parameters on various data types….

```
declare @color nvarchar(50)=null
declare @currencyKey nvarchar(50)=null
declare @orderDateFrom smalldatetime = null
declare @orderDateTo smalldatetime = null
declare @productCost int = null
select top 20 englishproductname, salesamount, totalproductcost
from factinternetsales
left join dimproduct on factinternetsales.productKey = dimproduct.productKey
where
(@color is null or color in (@color))
and
(@currencyKey is null or currencyKey in (@currencyKey))
and
(@orderDateFrom is null or OrderDate > (@orderDateFrom))
and
(@orderDateTo is null or OrderDate < (@orderDateTo))
and
(@productCost  is null or TotalProductCost > (@productCost))
```

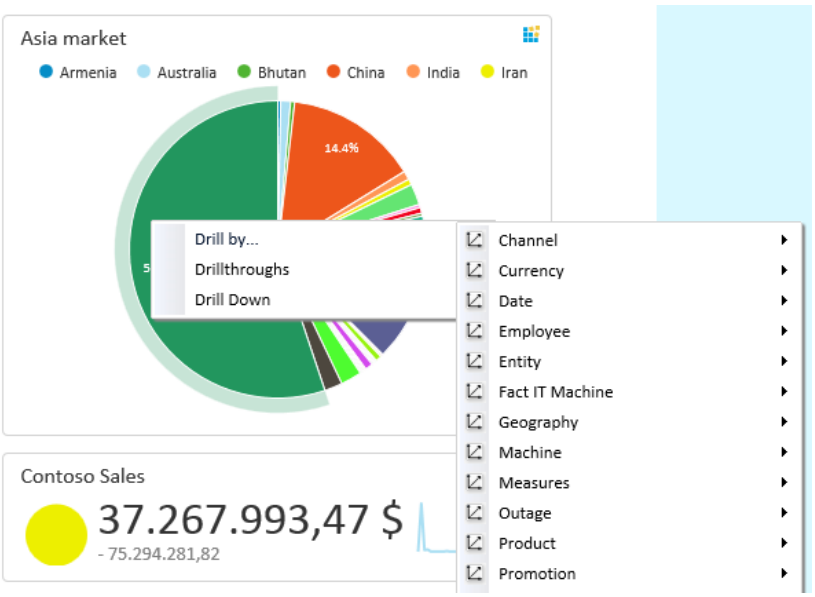
9.3. Exclude dashboard tile from filtering

By default all dashboard tiles accept filters defined on the dashboard level. Each dashboard tile can be excluded from accepting filters added to dashboard, that will be ignored in such case.



9.4. Tiles drilldown, drill-through OLAP actions within dashboard

All dashboard tiles based on OLAP data source could be drilled down, sliced or drilled through in place within dashboard. Right click on the OLAP dashboard tile and selected one of available OLAP actions.



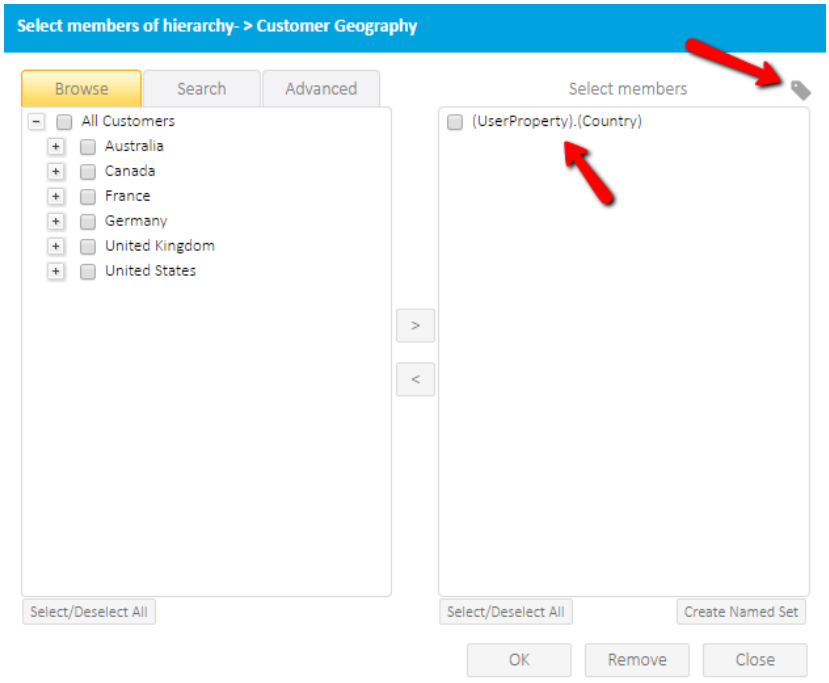
9.5 User Properties as Dashboard filters

Dashboard could be filtered using current user properties to show data of interest for current user. User properties are Login Name, Real Name of current user or custom created user properties that could be assigned and changed by the Kyubit administrator.

To create and manage user properties, Kyubit Administrator should navigate to Administration -> 'Users and Admins', create new custom user properties and click on each user to assign his custom property values.

'User Properties' could be used to filter Analyses, Queries and Dashboards.

To add 'User Property' as OLAP analysis, while in filter dialog form, click on the 'User Property' icon on the upper right and choose one of existing 'User Property'. More values under same property should be delimited with semicolon (;).

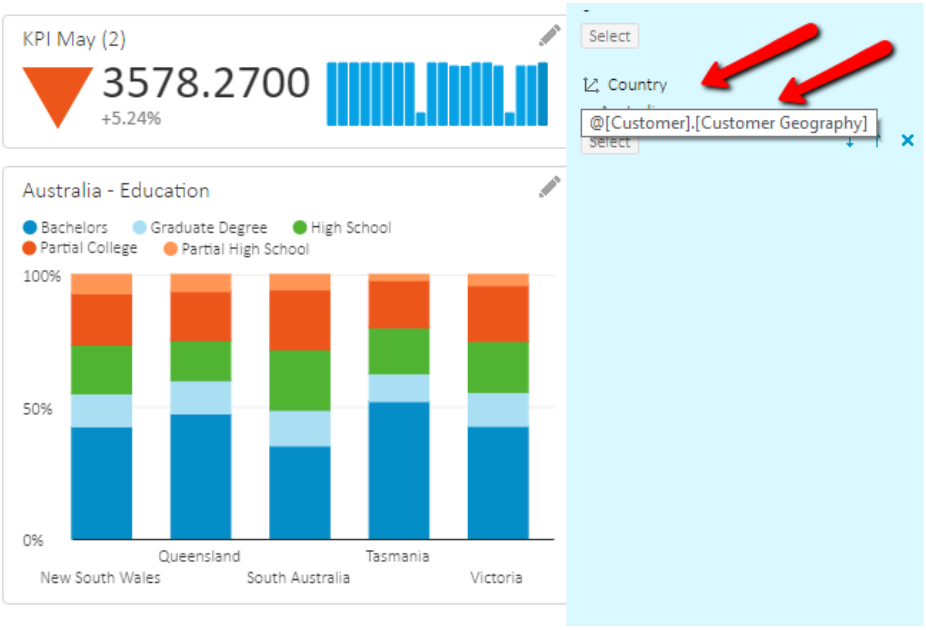


Every time user opens analysis, 'User Property' value will be resolved and used to filter analysis data using current user property value.

9.5. Define dashboard filters using URL

If dashboard contains SQL or OLAP filters, filter values could be set using URL opening the dashboard. This gives great flexibility how data will be sliced and manage dashboard data scope outside Kyubit application.

While in dashboard design mode move your mouse over added filters, filter parameter name is displayed that could be added to dashboard URL to slice data with ad-hoc values.



In this example, filter with title 'Country' is represented with parameter ID = '[Customer].[Customer Geography]'. In order to supply value for this filter using URL, we add member unique name for Australia -> [Customer].[Customer Geography].[Country].&[Australia] …

@[Customer].[Customer Geography]=[Customer].[Customer Geography].[Country].%26[Australia]

… to dashboard URL. Note that '&' character is replaced by %26 HTML escape code for ampersand. If filter parameter requires more values, separate them with (;) semicolon.

@[Customer].[Customer Geography]=[Customer].[Customer Geography].[Country].%26[Australia]; [Customer].[Customer Geography].[Country].%26[Canada]

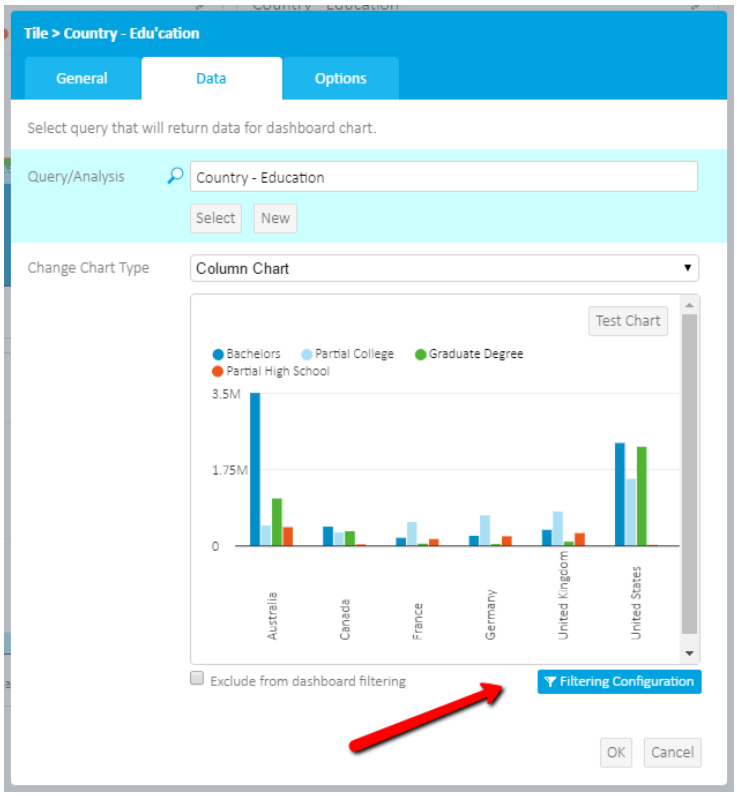
… creating final URL …

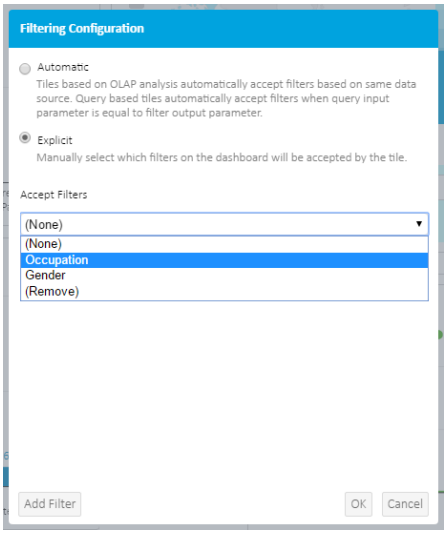
http://localhost:85/Forms/Dashboard.aspx?DashboardID=3028&@[Customer].[Customer Geography]=[Customer].[Customer Geography].[Country].%26[Australia]; [Customer].[Customer Geography].[Country].%26[Canada]

9.6. Dashboard filters configuration

'Automatic Filtering Configuration' is default way of handling dashboard filters. For OLAP data, this means, when dashboard filter is added, it would automatically be applied on all dashboard tiles that are based on same OLAP data source. For SQL data based tiles, this means that filter would be automatically applied to all queries based upon same 'Input parameter'.

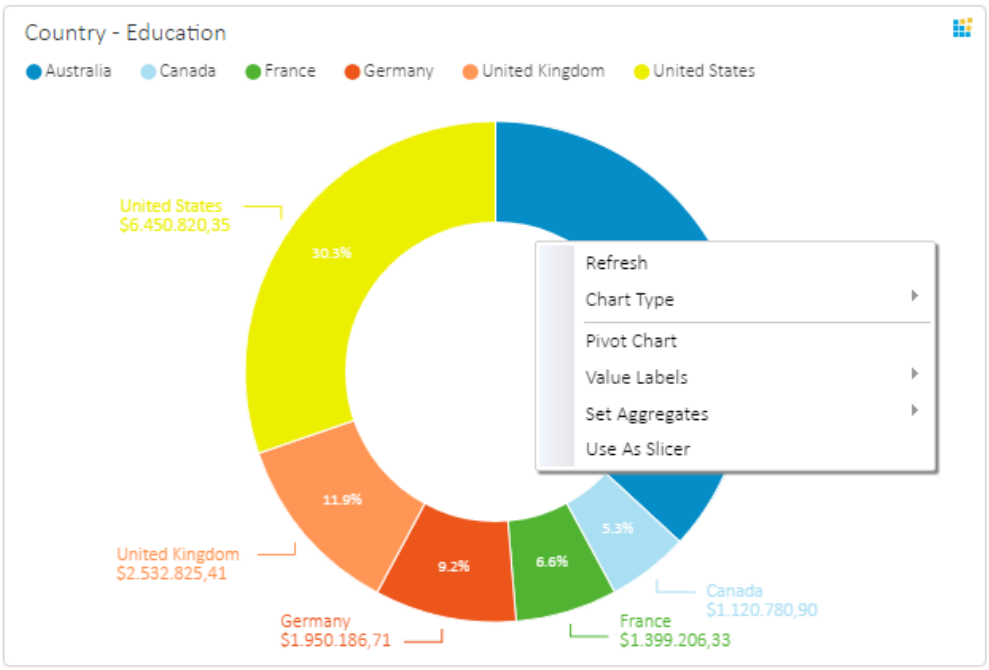
'Explicit Filtering Configuration' is process in which dashboard designer could select for each dashboard tile, which dashboard filters it will used when retrieving data from data sources. On this way, dashboard designer can fine tune, how filters will be implemented for each tile on the dashboard. For example, dashboard tile based on OLAP data, could accept filter values that are based on some other OLAP data source.



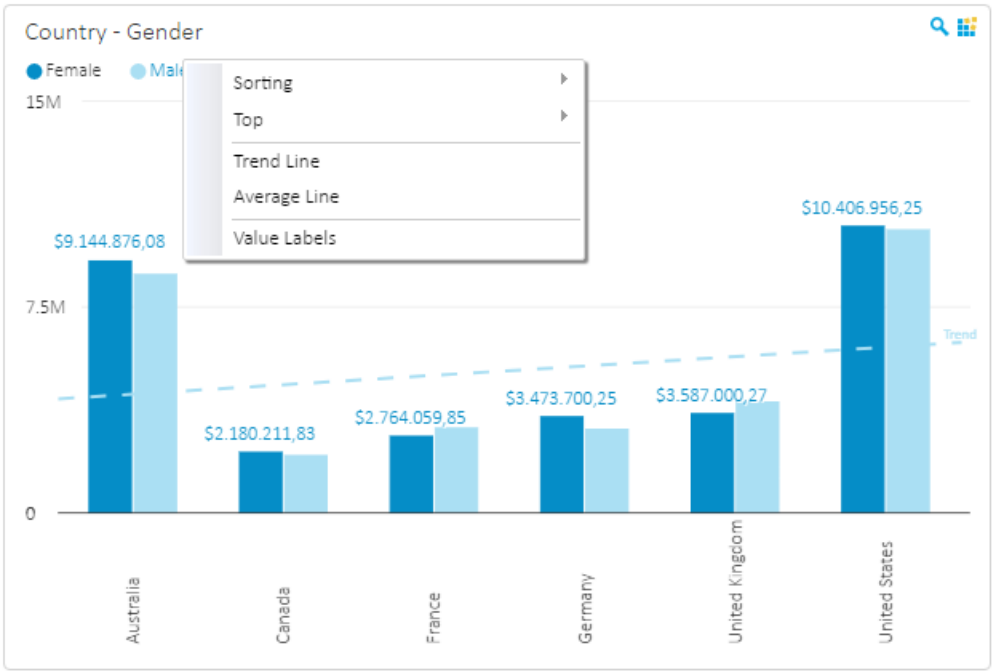


9.7. End-User actions on the dashboard

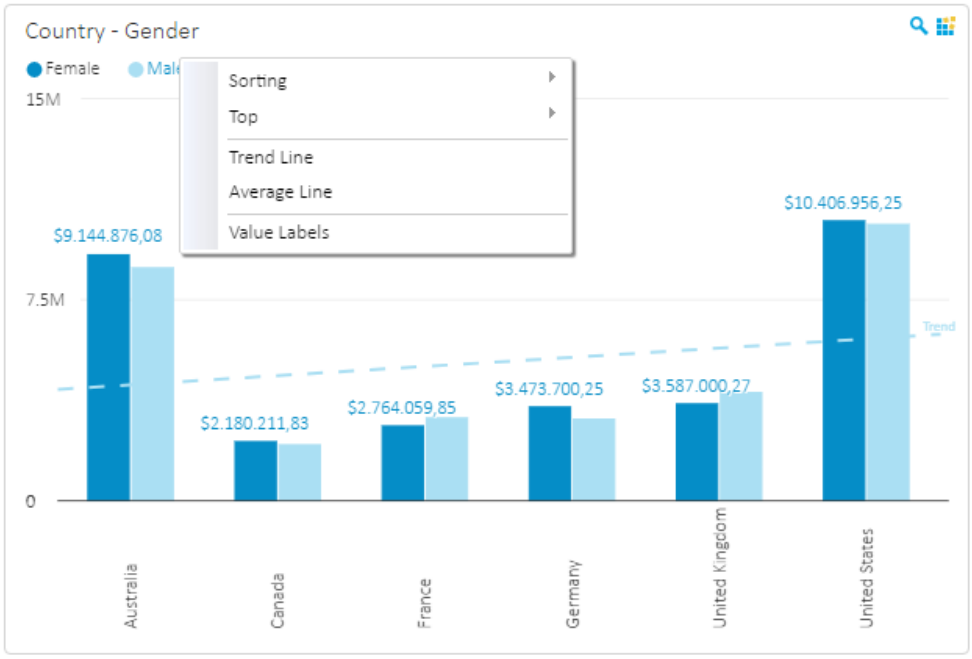
After Dashboard is rendered in production usage to end-users, there are several options user can choose to additionally arrange and visually analyze data. Right-click on the dashboard tile to show main user actions, such is 'Refresh' tile data, change 'Chart Type', pivot tile data category and series values for the tile with 'Pivot Chart' action, show 'Values Labels' on the chart with additional selection on how many items labels would be displayed, set temporary 'Aggregate' (SUM or AVG) value that could be used to compare with existing tile chart values or click on 'Use as Slicer' option to turn tile as dashboard slicer mode.



Right-click on the chart legend shows additional actions that could be used on particular series of values on the chart. Such is 'Sorting' of the data on the chart, display 'Top X' items on the chart,

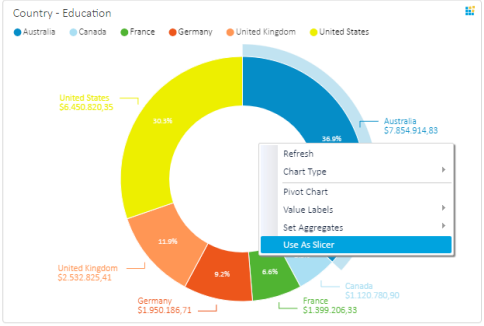


… or toggle display of 'Trend' or 'Average' line on the chart and 'Value Labels' for particular series of values on the chart.



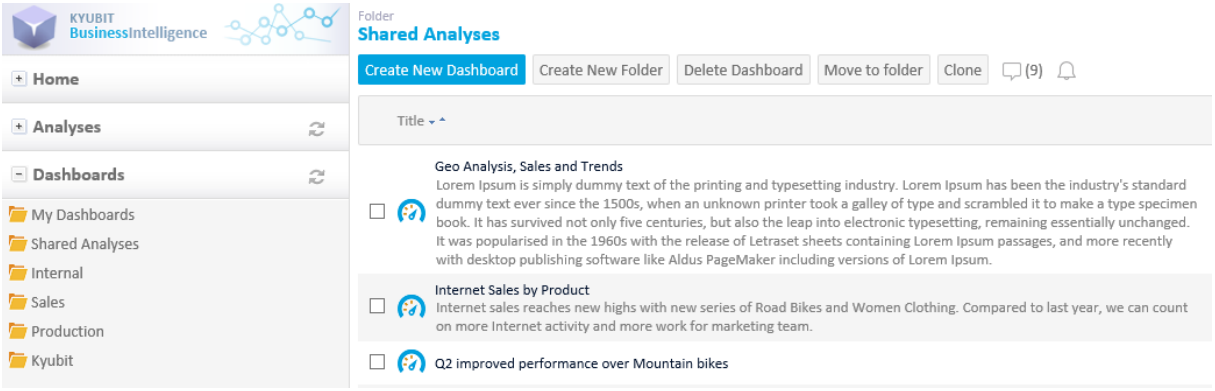
9.8. Use chart as 'Slicer'

From the version 3.7 of Kyubit Business Intelligence app, end-user while working on the dashboard can choose several chart types and turn them into whole dashboard slicers. Chart types 'Pie Chart', 'Doughnut Chart', 'Column Chart', 'Line Chart' and 'TreeMap Chart' could be toggled to 'Use as slicer' mode with a single click of end-user, if data chart is based upon OLAP data. At the same time, more than one chart on the dashboard could be set to work in 'Slicer' mode, giving many possibilities to slice and analyze data of interest on the dashboard.



10. Folders and dashboards access permissions

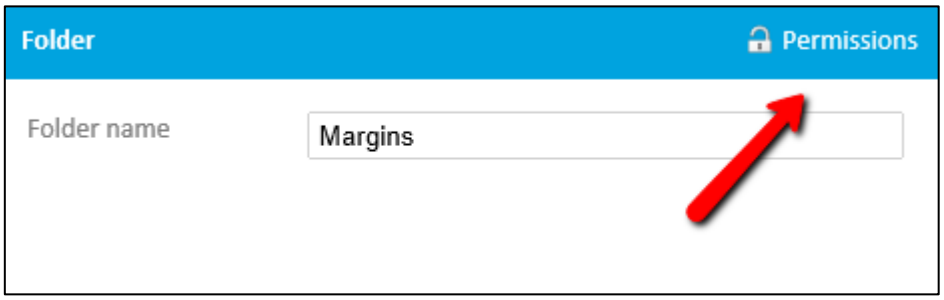
To group more dashboards into logical group that shares same user permissions, folders could be created to contain any number of dashboards. When created, dashboard by default is located in 'My Dashboards' folder, visible only to dashboard creator. At any time user can share dashboard with other users by moving dashboard to folder that is shared by other users.



To create folder, choose option 'Create New Folder', fill-in folder title and click save. New folder will appear in the list of folders. New folder is by default visible only to creator and administrators. To give other people access to folder, open the same folder (Edit option) and select 'Permissions' in the upper-right corner.

10.1. Setting object permissions

To set permissions for any Kyubit Business Intelligence object, click on the 'Permissions' option in the upper-right corner of the form and edit object permission.

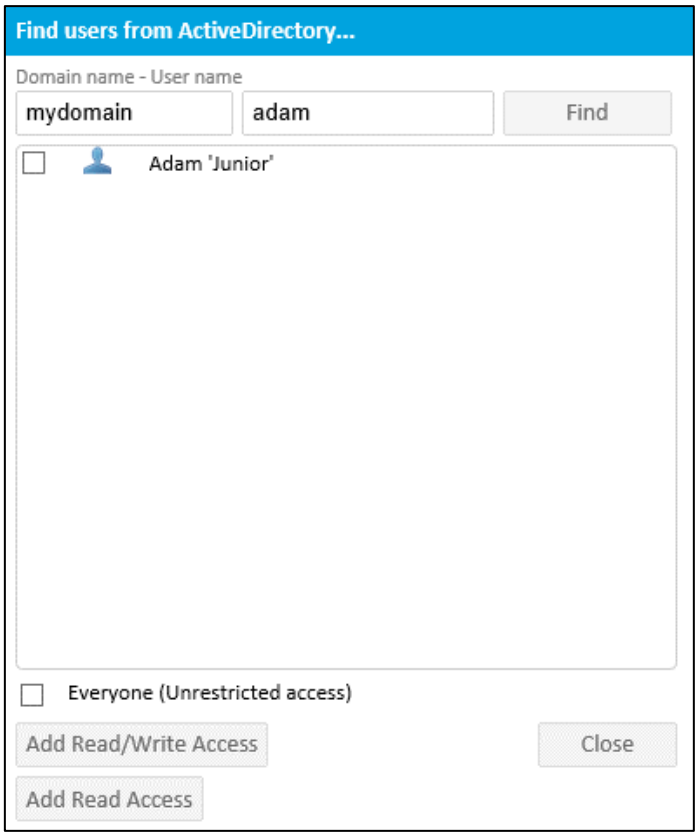


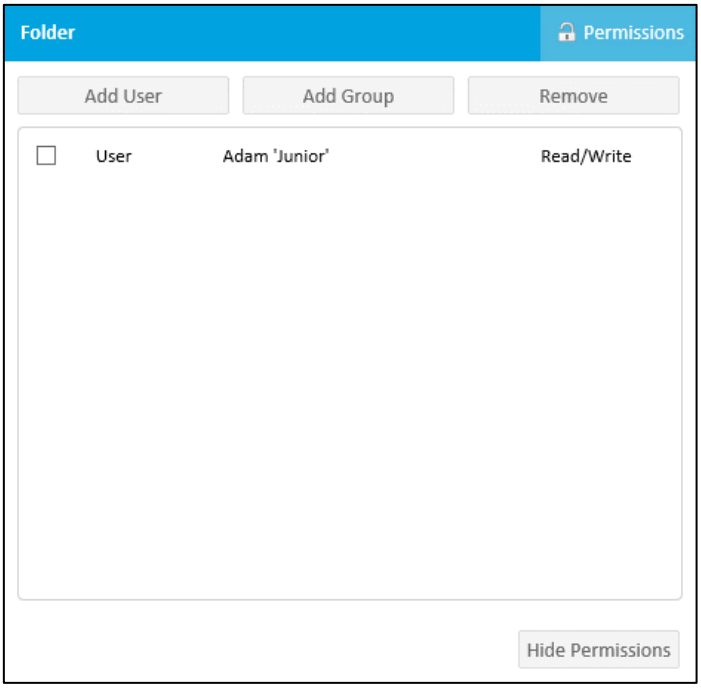
Search for domain users and groups to set appropriate permissions.

Read/Write permission gives full rights on folder and dashboards within folder.

Read permission give right to see folder and open all dashboards within folder. No changes are allowed.

By setting permissions to 'Everyone' (unrestricted) gives (Read or Read/Write) permission to any user that is trying to access folder and all dashboards within folder.


Find users from ActiveDirectory...
Domain name - User name
mydomain
adam
Find
Adam 'Junior'
Everyone (Unrestricted access)
Add Read/Write Access
Close
Add Read Access

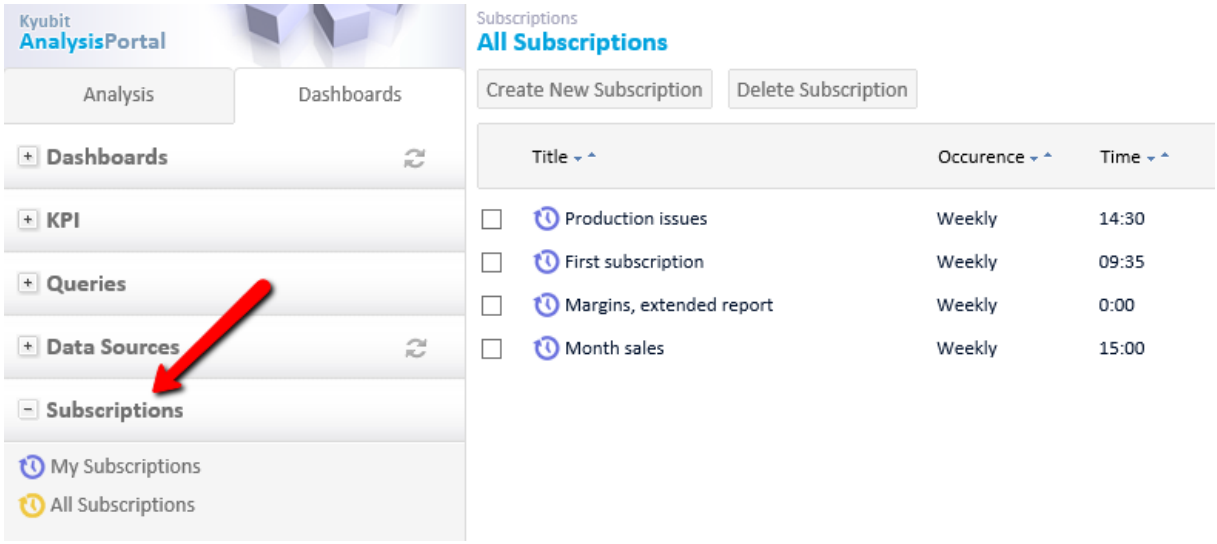

Folder
Permissions
Add User
Add Group
Remove
User
Adam 'Junior'
Read/Write
Hide Permissions

11. Subscriptions

Important aspect of Kyubit Business Intelligence dashboards usage is to deliver dashboards to users using email subscriptions, which contain dashboard data in form of HTML with embedded dashboard image or attached PDF document with dashboard details. Every user of Kyubit Business Intelligence with at least 'Read' permission has privileges to make a subscription to dashboard and receive dashboard on email within scheduled time of delivery. To create subscriptions, user needs to update his 'email address' and 'credentials' in the user settings form (upper left icon in the 'Home' page).

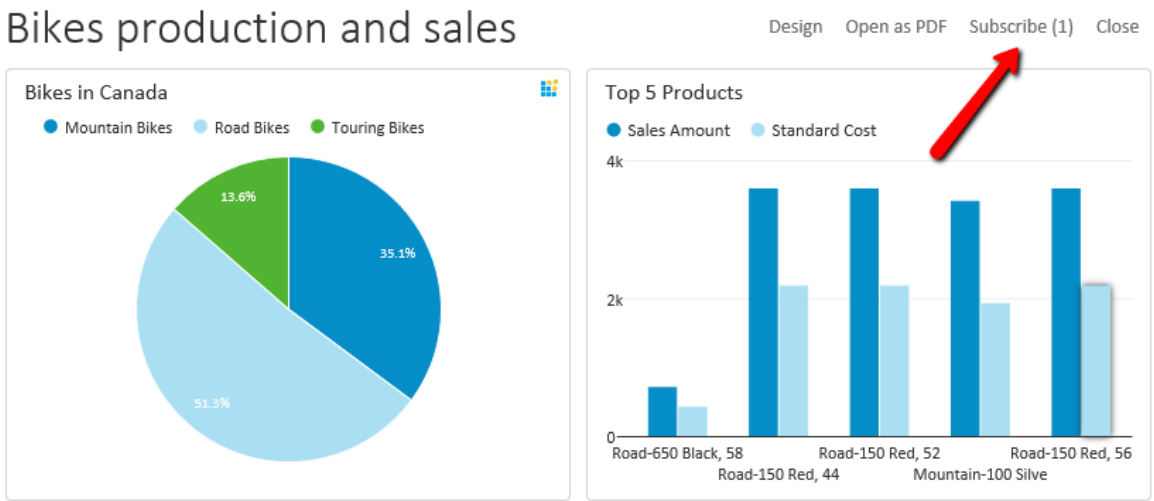
11.1. My subscriptions

Every user can see all his own subscriptions (Analysis and Dashboards) in Kyubit Business Intelligence -> Dashboards section, where all his subscriptions could be managed.

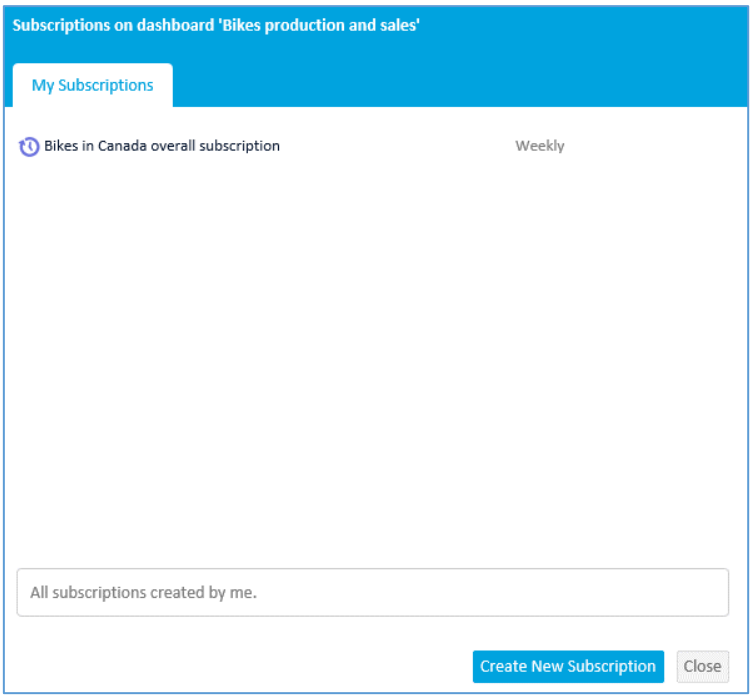


11.2. Subscriptions within dashboard

When user opens certain dashboard, he can immediately see if he already has some subscriptions created to the same dashboard.

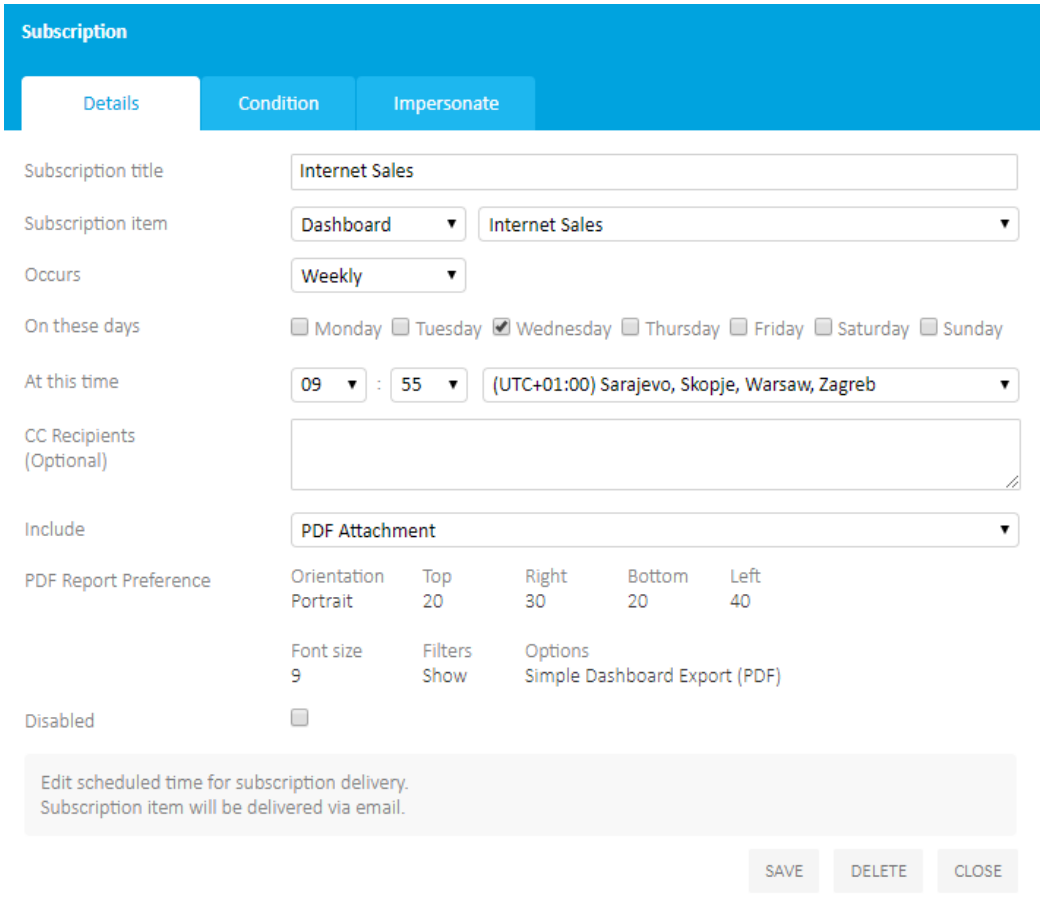


By click on "Subscribe" link, form with existing subscriptions of current user will be displayed with option to create new subscription, edit or delete existing.

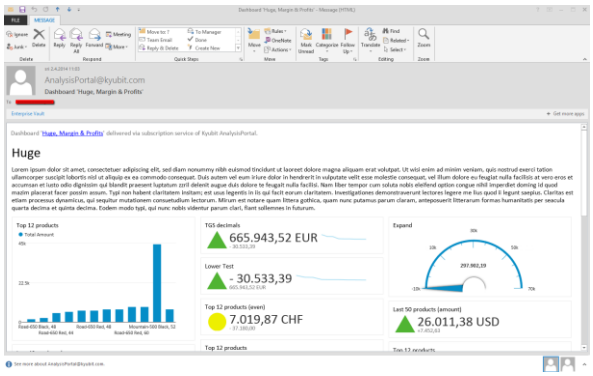


11.3. Subscription details

There are several subscription settings that could impact the way users are receiving subscriptions.



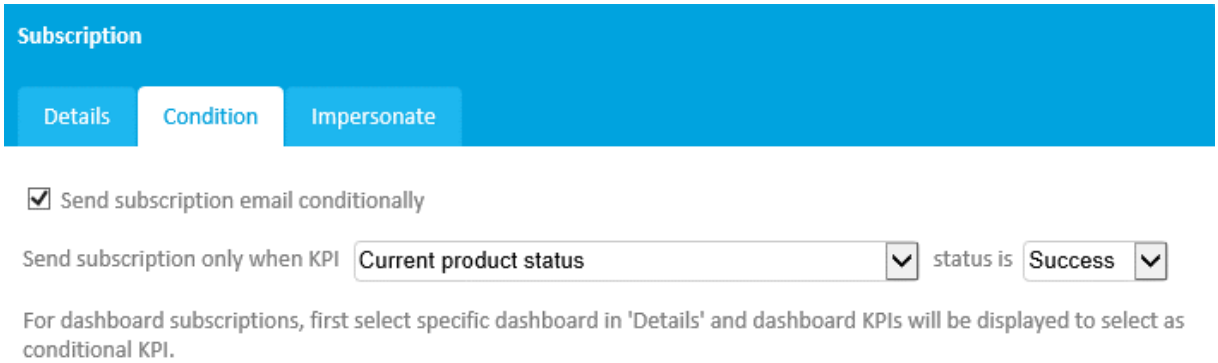
- **Subscription title**, sets the name that will appear when delivering dashboard/analysis inside email message.
- **Subscription item**, selects Kyubit Business Intelligence content (Analysis or Dashboard) to deliver within subscription. User can subscribe to all content with at least 'Read' permissions.
- **Occurs,** defines scheduled time to deliver subscription. There are three different time scheduling categories:
    - **Weekly,** set the week days to deliver subscription
    - **Monthly,** set the month days to deliver subscription
    - **Once,** set single day to deliver subscription
- **Time,** sets time within day to deliver subscription
- **CC Recipients,** optional list of email addresses to deliver subscription (separated by semicolon)
- **Include,** type of delivered content
    - **Only link** to Kyubit Business Intelligence dashboard
    - Link + **embedded dashboard image** (user immediately sees dashboard image when opens email message)



    - Link + **PDF dashboard document**
- **Disable,** all subscriptions marked disable will not be delivered at scheduled time.

11.4. Send subscriptions conditionally

Dashboard subscriptions have ability to be sent conditionally, depending on the one of containing KPI status.

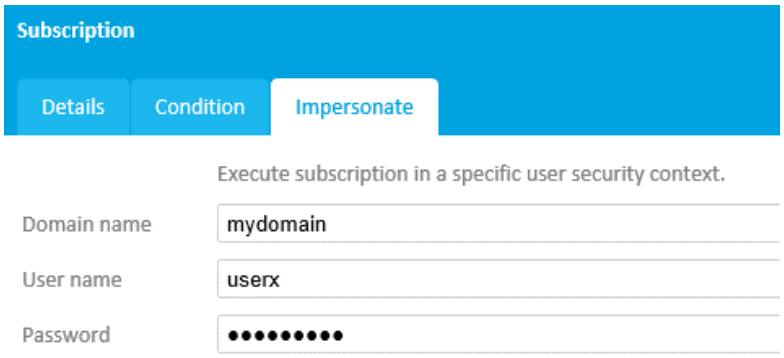


If dashboard contains at least one KPI, it could be used to set condition to send subscription. For example, if some Key performance indicator is in status "Fail", subscription could be sent to alarm and inform appropriate users.

11.5. Impersonate subscriptions data usage

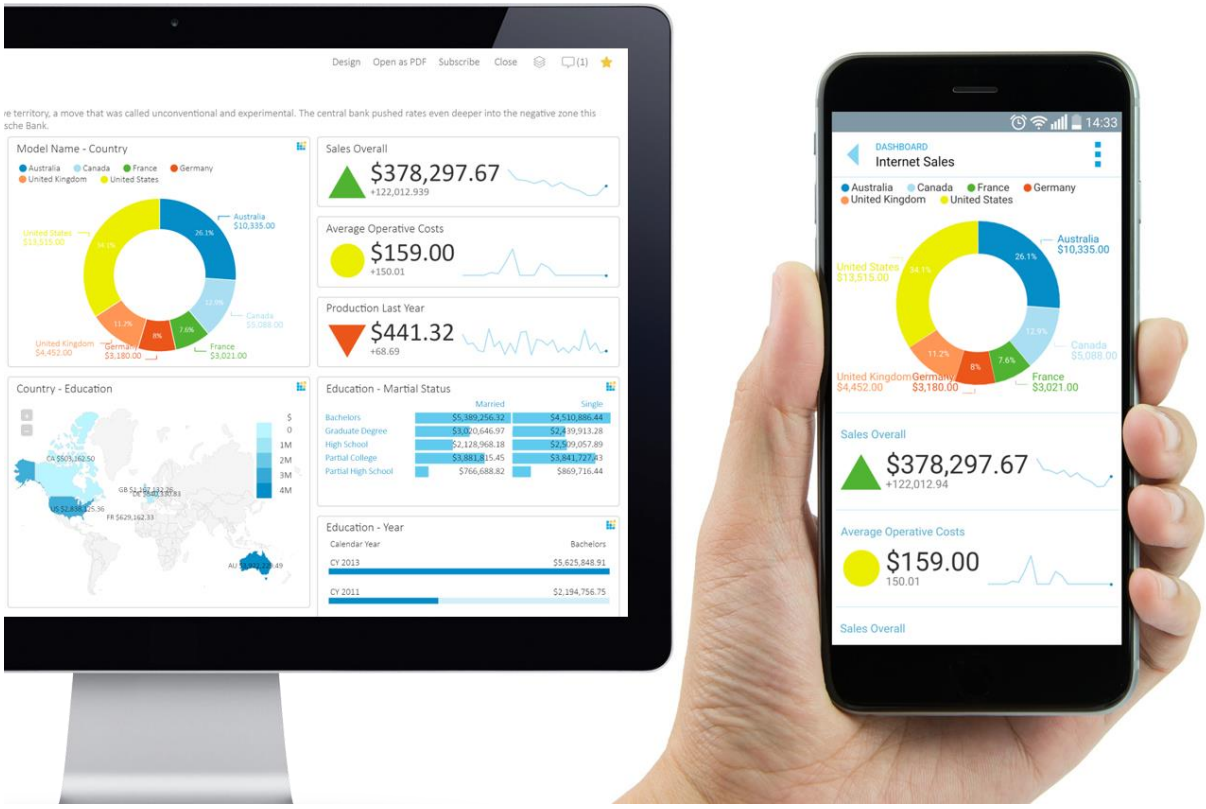
By default, subscriptions are performed in the context of “Kyubit Subscription” windows service logon user. In some cases, same user does not have access to dashboard or analysis data source. If impersonate user credentials are provided, subscription will be performed in the context of impersonated user, regardless of “Kyubit Subscription” windows service logon user.

Impersonate feature could be also used to deliver data relevant for specific user. For example, one user could have permissions to see OLAP dimensions and measures, other user is not permitted. By setting specific user credentials subscribed content could be different for same analysis or dashboard than to other users.



12. Mobile Dashboards View

All Dashboards and dashboard folders created within 'Kyubit Business Intelligence' web application are available to connect from mobile devices using Windows (Active Directory) credentials of the current user. User is authorized to see exact same Dashboard objects and data as with Desktop view of Kyubit web application. Kyubit BI can be used internally to access data from mobile devices on local intranet and wireless connection or Kyubit application can be exposed externally on the web and users can reach their local business data from anywhere. Prepared Dashboards based on SQL and OLAP data can be accessed using mobile devices and mobile user interface to visualize and analyze data in real time. Mobile BI with Kyubit software is accessible using modern web technologies (HTML5, CSS3) and mobile web browsers.



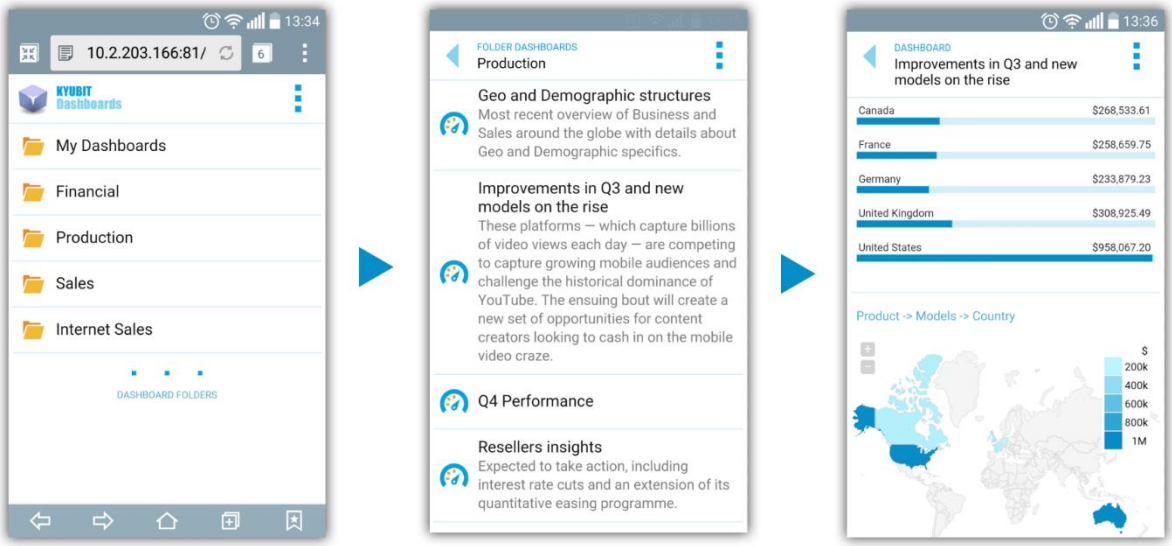
12.1. Connect Mobile Device to Kyubit Business Intelligence

To connect to Kyubit Business Intelligence and display created dashboards, simply open web browser on your mobile device and type URL of your Kyubit BI web application. If your Kyubit web application is exposed on the internet, enter URL of Kyubit app public web address and add '/Mobile/Index.html'

(For example, http://yourkyubitaddress/mobile/index.html)

To access Kyubit BI on the local intranet:

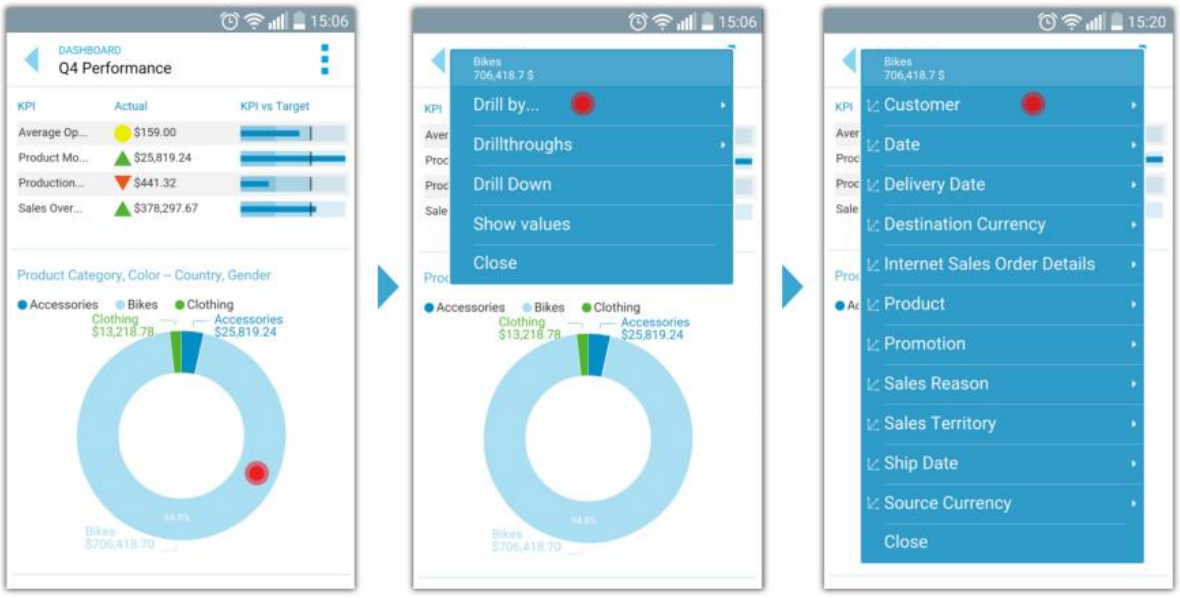
1) Find your server IP address. (Command prompt -> IPCONFIG)
2) Type URL to mobile device browser together with port number and /Mobile/Index.html (For example, http://10.2.203.166:81/Mobile/Index.html)
3) First time you will need to enter your Windows (Active Directory) credentials to access web application.



12.2. OLAP Analysis on Mobile Dashboards

Perform OLAP analysis Drill-Down and Drill-through actions to find more in-depth details of your data with touch of your fingers from Dashboards Mobile view. Select OLAP dimension level to Drill current data with multiple Drill-Down steps or get back to previous state of analysis. Select predefined Drill-through action that will return row details of the current OLAP visualization.

1) Open Dashboard with charts based on OLAP data
2) Touch chart segment you would like to explore with new details (Drill).
3) Select OLAP action: Drill-by, Drill-Down or Drill-Through.
4) Select OLAP dimension to drill.
5) Select OLAP dimension hierarchy - level to drill
6) Chart on the dashboards mobile view transforms to display drill down dimension level.
7) Repeat this step multiple time to reach analysis data of interest.
8) Select 'Back' to return to previous states of OLAP analysis



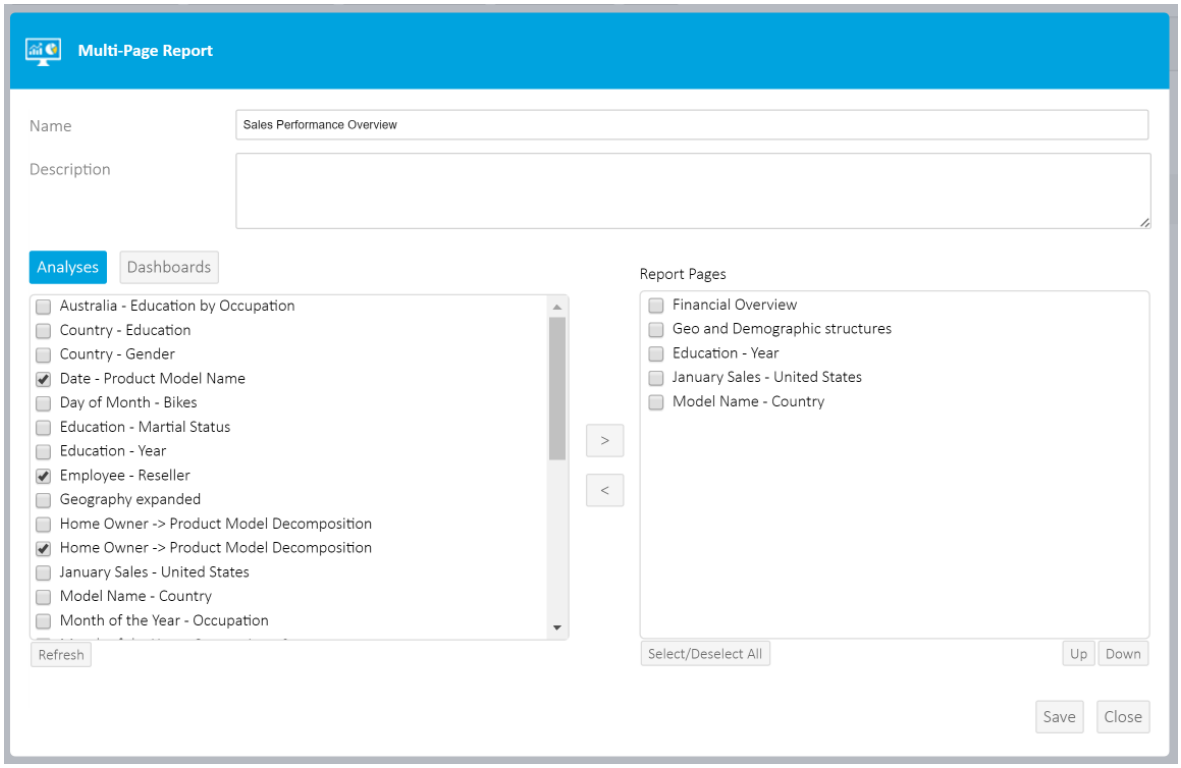
All dashboard visualizations available at dashboard design time will be rendered on mobile devices with all custom display options defined while designing dashboard. Visual options and data settings like, Color Theme Pallets, Value Labels, Average/Trend lines and others will behave same on mobile and desktop view of the dashboard. For each dashboard tile user can select chart visualization and option to 'Show Values' to see pure values that are base for chart visualization. OLAP data chart visualizations have option to 'Drill-Through' data for specific chart segment to see all leaf-level details that are related to chart segment of interest.

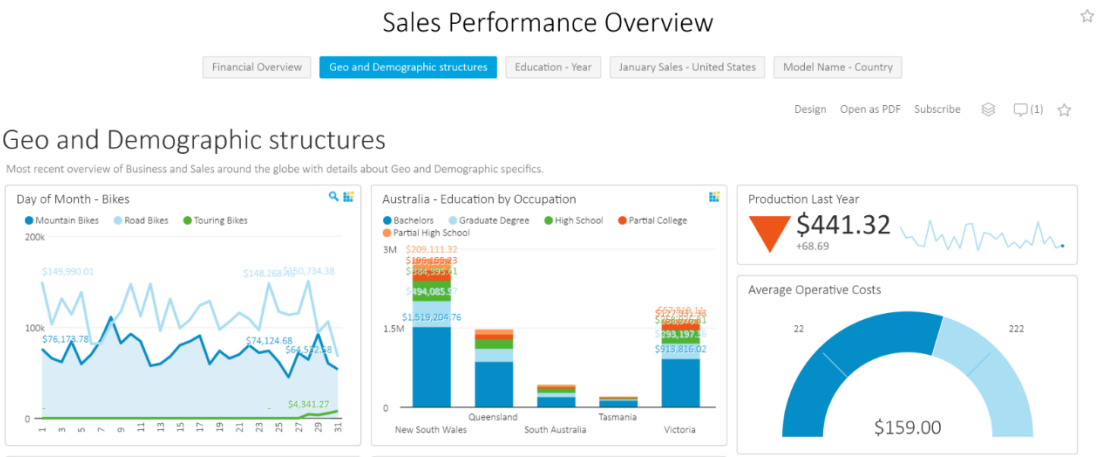
13. Multipage Reports

Multipage Report consist of more analyses and dashboards on the same report with tabs above to quickly switch from one analysis or dashboard to another. Multipage Report groups dashboards and analyses of common interest, so users do not have to look for the same on several different places on the portal. After you create Multipage Report simply send link to someone, who will be able to see all related BI content without having to leave the page.

To create Multipage report, follow this steps:

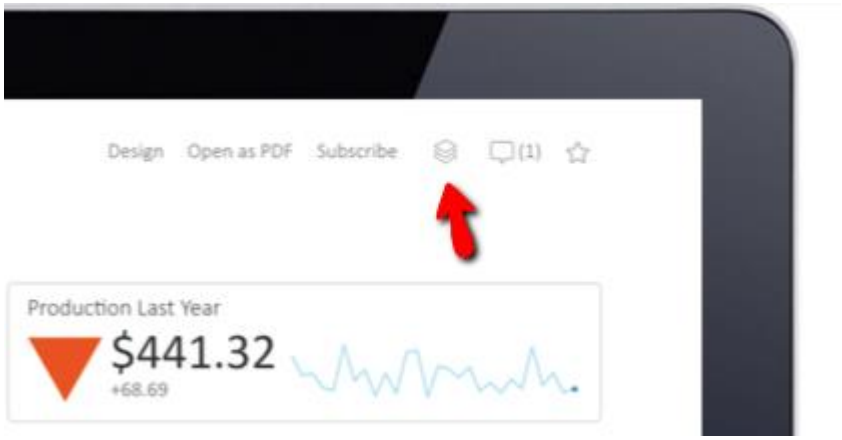
1) Click on New Dashboard / New Multipage Report button
2) Select analyses and dashboards to appear on the Multipage report
3) Select order of appearance of Dashboards and Analyses
4) Set Name and Description for Multipage Report and Save.
5) Multipage Report is displayed in Folder with Dashboards and could be shared with other users by moving to shared folders.





14. Dashboard Data Slideshow

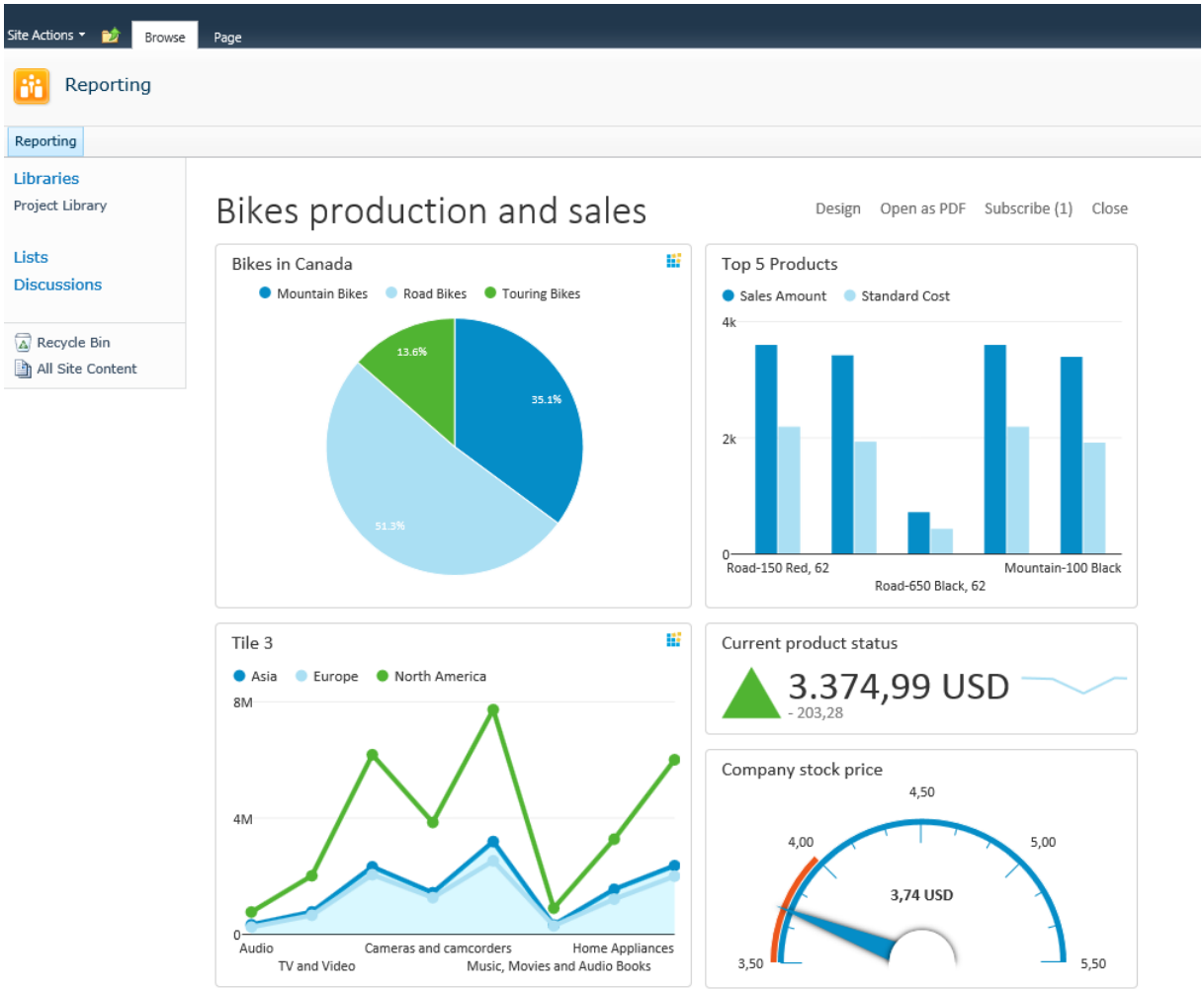
Click 'Slideshow' button that will start full-screen dashboard slideshow querying data sources and presenting visualizations and metrics in real-time.



While designing Dashboard user set slides transition duration and caching options that could cache return data and not query data sources for same visualization for a defined time in minutes. All dashboard visualizations are transformed to full-screen mode during slideshow presentation, presenting only chart/metric data, dashboard tile title and description for the displayed visualization. Slideshow logic rotates all dashboard visualization one by one, column by column, repeating until slideshow page is closed.

15. Integrate dashboards with other web applications and sites

Dashboard created within Kyubit Business Intelligence could be easily embedded/included in any HTML page using IFRAME element, allowing number of configuration options to customize dashboard appearance to best fit visually into existing HTML page.



Simple example of embedded dashboard using IFRAME element:

```
<iframe id="dashFrame" src="http://KyubitBI/Forms/Dashboard.aspx?DashboardID=3" width="800px" height="1000px" frameborder="0" scrolling="no"></iframe>
```

Add IFRAME element and set SRC attribute to URL of the dashboard from Kyubit Business Intelligence application (Same URL if opened from Kyubit Business Intelligence application).

Additional URL attributes to customize dashboard appearance:

- **Align**, alignment of the dashboard within IFRAME element
- **Font**, dashboard fonts
- **FontColor**, dashboard font color
- **TileFontSize**, dashboard title size

- **HideDesignButton**, hides 'Design' button
- **HideCloseButton**, hides 'Close' button
- **HideOpenPDFbutton**, hides 'Open PDF' button
- **HideSubscribeButton**, hides 'Subscribe' button

Example with all attributes:

```
<iframe id="dashFrame"
src="http://KyubitBI/Forms/Dashboard.aspx?DashboardID=3&align=right&font=helvetica&fontColor=red&tileF
ontSize=11px&hideDesignButton=1&hideCloseButton=1&hideOpenPDFbutton=1&hideSubscribeButton=1"
width="800px" height="1000px" frameborder="0" scrolling="no"></iframe>
```

16. Geo Maps available lists of keys

OLAP and SQL data that are geographically related could be displayed in Geo Maps dashboard tile. Data has to match “codes” or “names” for specific Geo map that presents certain country or region. Below is list of available “codes” and “names” for specific Geo Map.

16.1. Continents

No	Code	Name
1	AF	Africa
2	NA	North America
3	OC	Oceania
4	AS	Asia
5	EU	Europe
6	SA	South America

16.2. World, Africa, Asia, Europe, Oceania, South America, North America

No	Code	Name
1	BD	Bangladesh
2	BE	Belgium
3	BF	Burkina Faso
4	BG	Bulgaria
5	BA	Bosnia and Herz.
6	BN	Brunei
7	BO	Bolivia
8	JP	Japan
9	BI	Burundi
10	BJ	Benin
11	BT	Bhutan
12	JM	Jamaica
13	BW	Botswana
14	BR	Brazil
15	BS	Bahamas
16	BY	Belarus
17	BZ	Belize
18	RU	Russia
19	RW	Rwanda
20	RS	Serbia
21	TL	Timor-Leste
22	TM	Turkmenistan
23	TJ	Tajikistan
24	RO	Romania

25	GW	Guinea-Bissau
26	GT	Guatemala
27	GR	Greece
28	GQ	Eq. Guinea
29	GY	Guyana
30	GE	Georgia
31	GB	United Kingdom
32	GA	Gabon
33	GN	Guinea
34	GM	Gambia
35	GL	Greenland
36	GH	Ghana
37	OM	Oman
38	TN	Tunisia
39	JO	Jordan
40	HR	Croatia
41	HT	Haiti
42	HU	Hungary
43	HN	Honduras
44	PR	Puerto Rico
45	PS	Palestine
46	PT	Portugal
47	PY	Paraguay
48	PA	Panama
49	PG	Papua New Guinea
50	PE	Peru
51	PK	Pakistan
52	PH	Philippines
53	PL	Poland
54	ZM	Zambia
55	EH	W. Sahara
56	EE	Estonia
57	EG	Egypt
58	ZA	South Africa
59	EC	Ecuador
60	IT	Italy
61	VN	Vietnam
62	SB	Solomon Is.
63	ET	Ethiopia
64	SO	Somalia
65	ZW	Zimbabwe
66	ES	Spain
67	ER	Eritrea
68	ME	Montenegro
69	MD	Moldova
70	MG	Madagascar
71	MA	Morocco
72	UZ	Uzbekistan
73	MM	Myanmar
74	ML	Mali
75	MN	Mongolia
76	MK	Macedonia

77	MW	Malawi
78	MR	Mauritania
79	UG	Uganda
80	MY	Malaysia
81	MX	Mexico
82	IL	Israel
83	FR	France
84	XS	Somaliland
85	FI	Finland
86	FJ	Fiji
87	FK	Falkland Is.
88	NI	Nicaragua
89	NL	Netherlands
90	NO	Norway
91	NA	Namibia
92	VU	Vanuatu
93	NC	New Caledonia
94	NE	Niger
95	NG	Nigeria
96	NZ	New Zealand
97	NP	Nepal
98	XK	Kosovo
99	CI	Côte d'Ivoire
100	CH	Switzerland
101	CO	Colombia
102	CN	China
103	CM	Cameroon
104	CL	Chile
105	XC	N. Cyprus
106	CA	Canada
107	CG	Congo
108	CF	Central African Rep.
109	CD	Dem. Rep. Congo
110	CZ	Czech Rep.
111	CY	Cyprus
112	CR	Costa Rica
113	CU	Cuba
114	SZ	Swaziland
115	SY	Syria
116	KG	Kyrgyzstan
117	KE	Kenya
118	SS	S. Sudan
119	SR	Suriname
120	KH	Cambodia
121	SV	El Salvador
122	SK	Slovakia
123	KR	Korea
124	SI	Slovenia
125	KP	Dem. Rep. Korea
126	KW	Kuwait
127	SN	Senegal
128	SL	Sierra Leone

129	KZ	Kazakhstan
130	SA	Saudi Arabia
131	SE	Sweden
132	SD	Sudan
133	DO	Dominican Rep.
134	DJ	Djibouti
135	DK	Denmark
136	DE	Germany
137	YE	Yemen
138	DZ	Algeria
139	US	United States
140	UY	Uruguay
141	LB	Lebanon
142	LA	Lao PDR
143	TW	Taiwan
144	TT	Trinidad and Tobago
145	TR	Turkey
146	LK	Sri Lanka
147	LV	Latvia
148	LT	Lithuania
149	LU	Luxembourg
150	LR	Liberia
151	LS	Lesotho
152	TH	Thailand
153	TF	Fr. S. Antarctic Lands
154	TG	Togo
155	TD	Chad
156	LY	Libya
157	AE	United Arab Emirates
158	VE	Venezuela
159	AF	Afghanistan
160	IQ	Iraq
161	IS	Iceland
162	IR	Iran
163	AM	Armenia
164	AL	Albania
165	AO	Angola
166	AR	Argentina
167	AU	Australia
168	AT	Austria
169	IN	India
170	TZ	Tanzania
171	AZ	Azerbaijan
172	IE	Ireland
173	ID	Indonesia
174	UA	Ukraine
175	QA	Qatar
176	MZ	Mozambique

16.3. USA

No	Code	Name
1	VA	Virginia
2	PA	Pennsylvania
3	TN	Tennessee
4	WV	West Virginia
5	NV	Nevada
6	TX	Texas
7	NH	New Hampshire
8	NY	New York
9	HI	Hawaii
10	VT	Vermont
11	NM	New Mexico
12	NC	North Carolina
13	ND	North Dakota
14	NE	Nebraska
15	LA	Louisiana
16	SD	South Dakota
17	DC	District of Columbia
18	DE	Delaware
19	FL	Florida
20	CT	Connecticut
21	WA	Washington
22	KS	Kansas
23	WI	Wisconsin
24	OR	Oregon
25	KY	Kentucky
26	ME	Maine
27	OH	Ohio
28	OK	Oklahoma
29	ID	Idaho
30	WY	Wyoming
31	UT	Utah
32	IN	Indiana
33	IL	Illinois
34	AK	Alaska
35	NJ	New Jersey
36	CO	Colorado
37	MD	Maryland
38	MA	Massachusetts
39	AL	Alabama
40	MO	Missouri
41	MN	Minnesota
42	CA	California
43	IA	Iowa
44	MI	Michigan
45	GA	Georgia
46	AZ	Arizona
47	MT	Montana
48	MS	Mississippi

49	SC	South Carolina
50	RI	Rhode Island
51	AR	Arkansas

16.4. India

No	Code	Name
1	BR	Bihar
2	PY	Puducherry
3	DD	Daman and Diu
4	DN	Dadra and Nagar Haveli
5	DL	Delhi
6	NL	Nagaland
7	WB	West Bengal
8	HR	Haryana
9	HP	Himachal Pradesh
10	AS	Assam
11	UT	Uttaranchal
12	JH	Jharkhand
13	JK	Jammu and Kashmir
14	UP	Uttar Pradesh
15	SK	Sikkim
16	MZ	Mizoram
17	CT	Chhattisgarh
18	CH	Chandigarh
19	GA	Goa
20	GJ	Gujarat
21	RJ	Rajasthan
22	MP	Madhya Pradesh
23	OR	Orissa
24	TN	Tamil Nadu
25	AN	Andaman and Nicobar
26	AP	Andhra Pradesh
27	TR	Tripura
28	AR	Arunachal Pradesh
29	KA	Karnataka
30	PB	Punjab
31	ML	Meghalaya
32	MN	Manipur
33	MH	Maharashtra
34	KL	Kerala

16.5. Norway

No	Code	Name
1	07	Vestfold
2	01	Østfold
3	06	Buskerud
4	21	Svalbard
5	20	Finnmark
6	03	Oslo
7	05	Oppland
8	10	Vest-Agder
9	11	Rogaland
10	12	Hordaland
11	04	Hedmark
12	14	Sogn og Fjordane
13	15	Møre og Romsdal
14	16	Sør-Trøndelag
15	17	Nord-Trøndelag
16	18	Nordland
17	19	Troms
18	08	Telemark
19	09	Aust-Agder
20	02	Akershus

16.6. Spain

No	Code	Name
1	NA	Navarra
2	B	Barcelona
3	CS	Castellón
4	ZA	Zamora
5	O	Asturias
6	OR	Orense
7	M	Madrid
8	L	Lérida
9	J	Jaén
10	H	Huelva
11	CU	Cuenca
12	T	Tarragona
13	C	La Coruña
14	AV	Ávila

15	A	Alicante
16	CR	Ciudad Real
17	CO	Córdoba
18	VA	Valladolid
19	Z	Zaragoza
20	MA	Málaga
21	AL	Almería
22	CE	Ceuta
23	PM	Baleares
24	VI	Álava
25	S	Cantabria
26	TE	Teruel
27	CC	Cáceres
28	P	Palencia
29	PO	Pontevedra
30	GI	Gerona
31	TO	Toledo
32	MU	Murcia
33	GR	Granada
34	GU	Guadalajara
35	AB	Albacete
36	SO	Soria
37	ML	Melilla
38	LU	Lugo
39	SE	Sevilla
40	CA	Cádiz
41	SG	Segovia
42	BU	Burgos
43	SA	Salamanca
44	V	Valencia
45	LE	León
46	BI	Bizkaia
47	HU	Huesca
48	LO	La Rioja
49	SS	Gipuzkoa
50	BA	Badajoz

16.7. Australia

No	Code	Name
1	ACT	Australian Capital Territory
2	WA	Western Australia
3	TAS	Tasmania
4	VIC	Victoria
5	NT	Northern Territory
6	QLD	Queensland
7	SA	South Australia
8	NSW	New South Wales

16.8. France

No	Code	Name
1	C	Auvergne
2	B	Aquitaine
3	A	Alsace
4	G	Champagne-Ardenne
5	F	Centre
6	E	Bretagne
7	D	Bourgogne
8	K	Languedoc-Roussillon
9	J	Île-de-France
10	I	Franche-Comté
11	YT	Mayotte
12	O	Nord-Pas-de-Calais
13	N	Midi-Pyrénées
14	M	Lorraine
15	L	Limousin
16	S	Picardie
17	R	Pays de la Loire
18	Q	Haute-Normandie
19	P	Basse-Normandie
20	V	Rhône-Alpes
21	U	Provence-Alpes-Côte-d'Azur
22	T	Poitou-Charentes
23	RE	Réunion
24	GF	Guyane française
25	H	Corse
26	MQ	Martinique
27	GP	Guadeloupe

16.9. Thailand

No	Code	Name
1	57	Chiang Rai
2	56	Phayao
3	55	Nan
4	54	Phrae
5	53	Uttaradit
6	52	Lampang
7	51	Lamphun
8	50	Chiang Mai
9	93	Phatthalung
10	92	Trang

11	91	Satun
12	90	Songkhla
13	96	Narathiwat
14	95	Yala
15	58	Mae Hong Son
16	13	Pathum Thani
17	12	Nonthaburi
18	11	Samut Prakan
19	10	Bangkok Metropolis
20	17	Sing Buri
21	16	Lop Buri
22	15	Ang Thong
23	14	Phra Nakhon Si Ayutthaya
24	71	Kanchanaburi
25	70	Ratchaburi
26	19	Saraburi
27	72	Suphan Buri
28	75	Samut Songkhram
29	73	Nakhon Pathom
30	77	Prachuap Khiri Khan
31	76	Phetchaburi
32	18	Chai Nat
33	39	Nong Bua Lam Phu
34	74	Samut Sakhon
35	84	Surat Thani
36	85	Ranong
37	86	Chumphon
38	80	Nakhon Si Thammarat
39	81	Krabi
40	82	Phangnga
41	83	Phuket
42	32	Surin
43	40	Khon Kaen
44	41	Udon Thani
45	42	Loei
46	43	Nong Khai
47	44	Maha Sarakham
48	45	Roi Et
49	46	Kalasin
50	47	Sakon Nakhon
51	48	Nakhon Phanom
52	49	Mukdahan
53	26	Nakhon Nayok
54	27	Sa Kaeo
55	24	Chachoengsao
56	25	Prachin Buri
57	22	Chanthaburi
58	23	Trat
59	20	Chon Buri
60	21	Rayong
61	62	Kamphaeng Phet
62	63	Tak

63	60	Nakhon Sawan
64	61	Uthai Thani
65	66	Phichit
66	67	Phetchabun
67	64	Sukhothai
68	65	Phitsanulok
69	35	Yasothon
70	34	Ubon Ratchathani
71	37	Amnat Charoen
72	33	Si Sa Ket
73	38	Bueng Kan
74	36	Chaiyaphum
75	31	Buri Ram
76	94	Pattani
77	30	Nakhon Ratchasima

16.10. Russia

No	Code	Name
1	PNZ	Penzenskaya oblast
2	VLA	Vladimirskaya oblast
3	LEN	Leningradskaya oblast
4	SAK	Sakhalinskaya oblast
5	KYA	Krasnoyarskiy kray
6	UD	Udmurtskaya Respublika
7	IVA	Ivanovskaya oblast
8	LIP	Lipetskaya oblast
9	AST	Astrakhanskaya oblast
10	CE	Chechenskaya Respublika
11	KHA	Khabarovskiy kray
12	ORE	Orenburgskaya oblast
13	KIR	Kirovskaya oblast
14	BA	Bashkortostan, Respublika
15	NGR	Novgorodskaya oblast
16	KLU	Kaluzhskaya oblast
17	OMS	Omskaya oblast
18	SAR	Saratovskaya oblast
19	ORL	Orlovskaya oblast
20	STA	Stavropolskiy kray
21	SE	Severnaya Osetiya-Alaniya, Respublika
22	SAM	Samarskaya oblast
23	SA	Sakha, Respublika
24	SVE	Sverdlovskaya oblast
25	KK	Khakasiya, Respublika
26	SPE	Sankt-Peterburg
27	MOS	Moskovskaya oblast
28	BEL	Belgorodskaya oblast
29	KHM	Khanty-Mansiyskiy avtonomnyy okrug

30	VLG	Vologodskaya oblast
31	CHE	Chelyabinskaya oblast
32	YAR	Yaroslavskaya oblast
33	TUL	Tulskaya oblast
34	IRK	Irkutskaya oblast
35	NIZ	Nizhegorodskaya oblast
36	YAN	Yamalo-Nenetskiy avtonomnyy okrug
37	KGD	Kaliningradskaya oblast
38	MOW	Moskva
39	KAM	Kamchatskiy kray
40	BU	Buryatiya, Respublika
41	KEM	Kemerovskaya oblast
42	CHU	Chukotskiy avtonomnyy okrug
43	ULY	Ulyanovskaya oblast
44	KGN	Kurganskaya oblast
45	KRS	Kurskaya oblast
46	KR	Kareliya, Respublika
47	ME	Mariy El, Respublika
48	IN	Ingushetiya, Respublika
49	MAG	Magadanskaya oblast
50	MO	Mordoviya, Respublika
51	TA	Tatarstan, Respublika
52	ZAB	Zabaykalskiy kray
53	RYA	Ryazanskaya oblast
54	TAM	Tambovskaya oblast
55	ARK	Arkhangelskaya oblast
56	KC	Karachayevo-Cherkesskaya Respublika
57	TY	Tyva, Respublika [Tuva]
58	MUR	Murmanskaya oblast
59	VOR	Voronezhskaya oblast
60	PSK	Pskovskaya oblast
61	TVE	Tverskaya oblast
62	VGG	Volgogradskaya oblast
63	KOS	Kostromskaya oblast
64	KL	Kalmykiya, Respublika
65	TOM	Tomskaya oblast
66	KO	Komi, Respublika
67	TYU	Tyumenskaya oblast
68	DA	Dagestan, Respublika
69	NVS	Novosibirskaya oblast
70	AD	Adygeya, Respublika
71	PER	Permskiy kray
72	ROS	Rostovskaya oblast
73	PRI	Primorskiy kray
74	KB	Kabardino-Balkarskaya Respublika
75	AL	Altay, Respublika
76	NEN	Nenetskiy avtonomnyy okrug
77	ALT	Altayskiy kray
78	KDA	Krasnodarskiy kray
79	YEV	Yevreyskaya avtonomnaya oblast
80	AMU	Amurskaya oblast
81	BRY	Bryanskaya oblast

82	SMO	Smolenskaya oblast
83	CU	Chuvashskaya Respublika

16.11. Netherlands

No	Code	Name
1	OV	Overijssel
2	FR	Friesland
3	UT	Utrecht
4	GE	Gelderland
5	FL	Flevoland
6	NH	Noord-Holland
7	ZE	Zeeland
8	ZH	Zuid-Holland
9	GR	Groningen
10	DR	Drenthe
11	NB	Noord-Brabant
12	LI	Limburg

16.12. Italy

No	Code	Name
1	23	Valle d'Aosta
2	21	Piemonte
3	25	Lombardia
4	52	Toscana
5	36	Friuli-Venezia Giulia
6	42	Liguria
7	45	Emilia-Romagna
8	57	Marche
9	32	Trentino-Alto Adige
10	55	Umbria
11	67	Molise
12	34	Veneto
13	65	Abruzzo
14	62	Lazio
15	75	Apulia
16	77	Basilicata
17	78	Calabria
18	82	Sicily
19	72	Campania
20	88	Sardegna

16.13. Germany

No	Code	Name
1	BE	Berlin
2	ST	Sachsen-Anhalt
3	RP	Rheinland-Pfalz
4	BB	Brandenburg
5	NI	Niedersachsen
6	MV	Mecklenburg-Vorpommern
7	TH	Thüringen
8	BW	Baden-Württemberg
9	HH	Hamburg
10	SH	Schleswig-Holstein
11	NW	Nordrhein-Westfalen
12	SN	Sachsen
13	HB	Bremen
14	SL	Saarland
15	BY	Bayern
16	HE	Hessen

16.14. Switzerland

No	Code	Name
1	SO	Solothurn
2	LU	Lucerne
3	SH	Schaffhausen
4	SG	Sankt Gallen
5	UR	Uri
6	NE	Neuchâtel
7	BS	Basel-Stadt
8	JU	Jura
9	BL	Basel-Landschaft
10	SZ	Schwyz
11	BE	Bern
12	NW	Nidwalden
13	ZG	Zug
14	FR	Fribourg
15	ZH	Zürich
16	VS	Valais
17	VD	Vaud

18	TI	Ticino
19	TG	Thurgau
20	OW	Obwalden
21	AG	Aargau
22	GE	Genève
23	AI	Appenzell Innerrhoden
24	GL	Glarus
25	GR	Graubünden
26	AR	Appenzell Ausserrhoden

16.15. US – States

For US states provide data that exactly match county name or its five digit code.
For example,
“Knox” or “39083” for “Knox county”,
“Belmont” or “39013” for “Belmont County”.