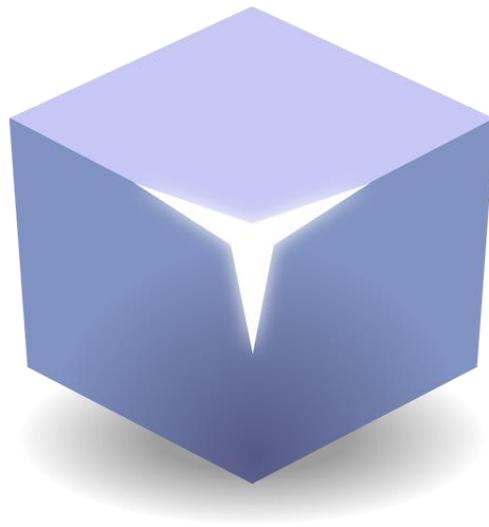


Dashboard Tools and Features with Kyubit Business Intelligence

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Dashboard Tools and Features - User Manual

Using dashboard features with Kyubit Business Intelligence

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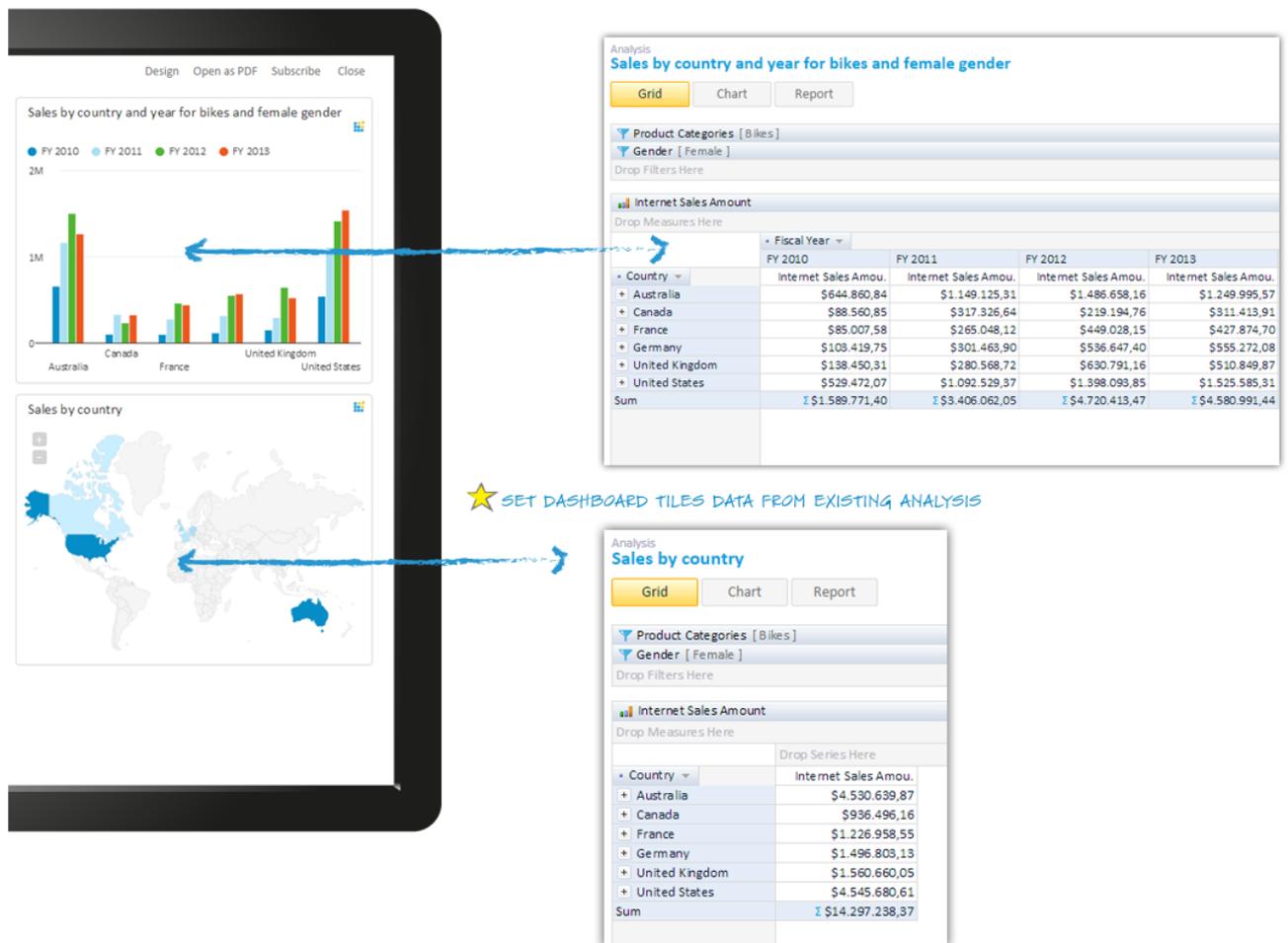
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1. Dashboard features overview

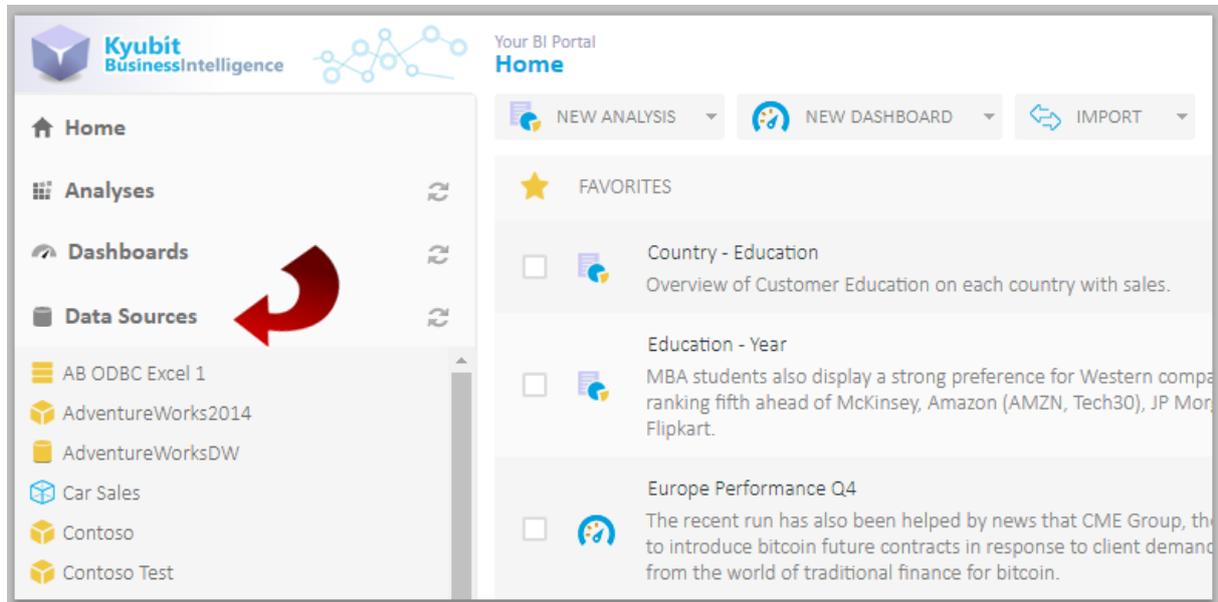
Kyubit dashboard features are designed to present data from **OLAP/SQL** databases and **CSV** files, to give simple and comprehensive feedback about important business values and trends. While creating a dashboard, the user has various visual options to present data most efficiently regarding the nature of data and business requirements. Easy drag-and-drop features make dashboard design and creation simple and straightforward task, which is easy to adopt by any user. To retrieve data for dashboard chart elements, existing analyses or SQL/MDX queries could be created. Dashboards could be also delivered to users using **Mobile devices**, **Scheduled Subscriptions** or as **Embedded Analytics** integrated within any HTML page. To work with dashboard features, select 'Dashboards' tab on the top of the Kyubit Business Intelligence application.



2. Managing Data Sources

All data for dashboard elements is retrieved from data sources that contain interesting business data for the presentation and metrics. 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, ODBC** data sources. ('Analytic Models' as a separate data source could be created using any of the above-mentioned data sources.)



2.1. OLAP and SQL server data sources

Create a 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 application and by the users who are given permission to work with.

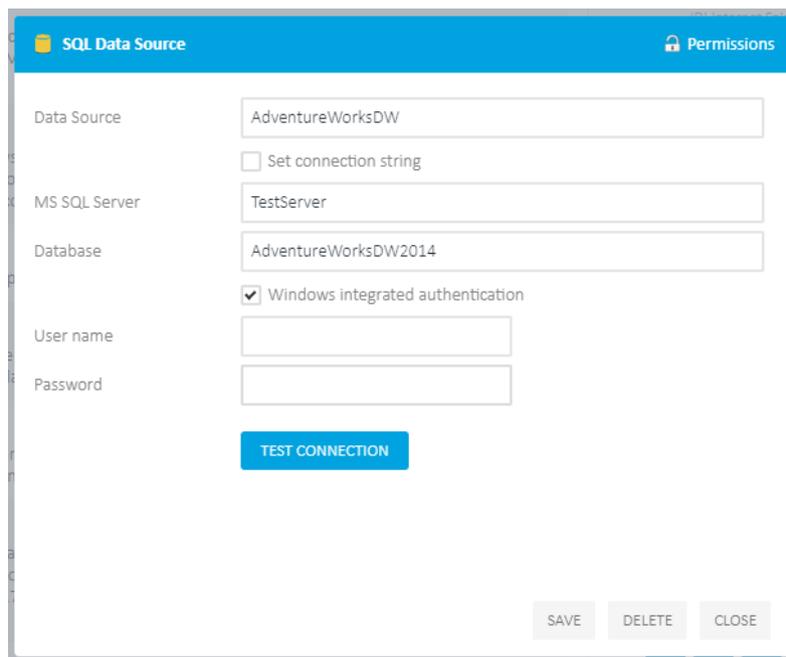
OLAP Data Source

 The screenshot shows the 'OLAP Data Source' configuration window. It has a blue header with the title and a 'Permissions' link. The form contains the following fields:

- OLAP reference name: AdventureWorks2014
- Server (Data source): TestServer
- OLAP database (Catalog): AdventureWorks2014Play
- Cube name or Tabular model: Adventure Works

 There is a checkbox for 'Set custom connection string' which is unchecked. Below the fields are buttons for 'TEST CONNECTION', 'SAVE', 'DELETE', 'REFRESH CUBE CACHE', and 'CLOSE'. At the bottom, there is a note: 'Provide data for Analysis Services OLAP data source. Once created, other users will be able to use 'OLAP Data Source' for analysis, based on their permissions in the OLAP role-based security.'

SQL Server Data Source



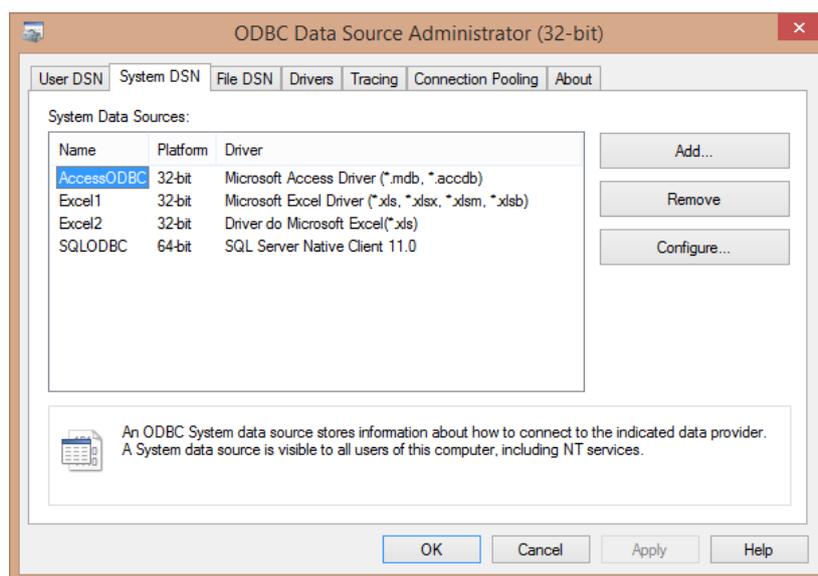
The screenshot shows a dialog box titled "SQL Data Source" with a "Permissions" icon in the top right. The dialog contains the following fields and options:

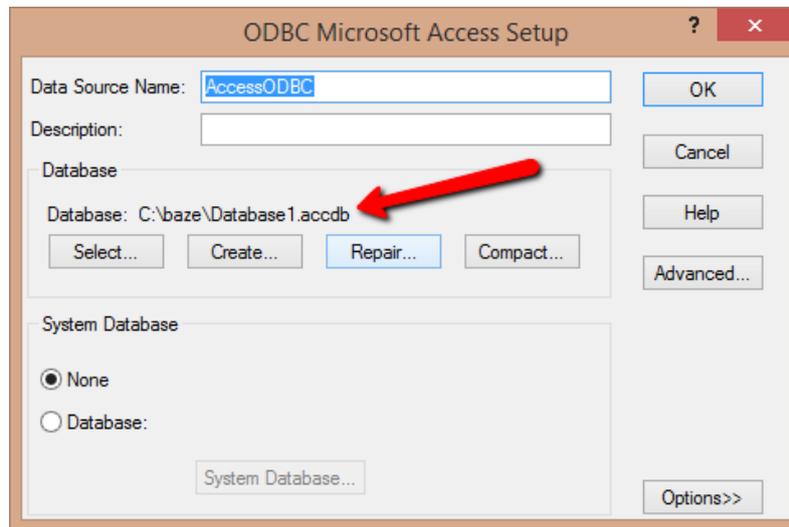
- Data Source: AdventureWorksDW
- Set connection string
- MS SQL Server: TestServer
- Database: AdventureWorksDW2014
- Windows integrated authentication
- User name: (empty field)
- Password: (empty field)
- TEST CONNECTION button
- SAVE, DELETE, and CLOSE buttons at the bottom right.

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

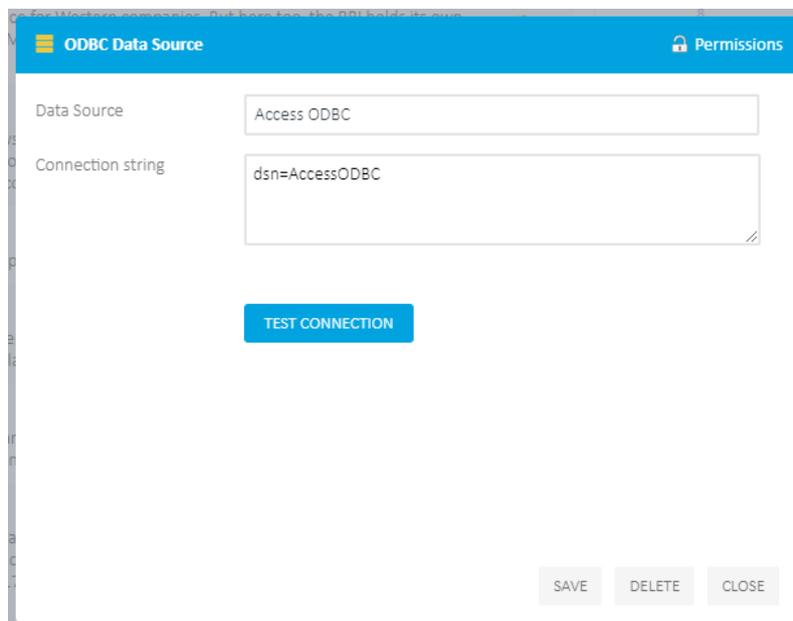
2.2. Set up ODBC data source

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

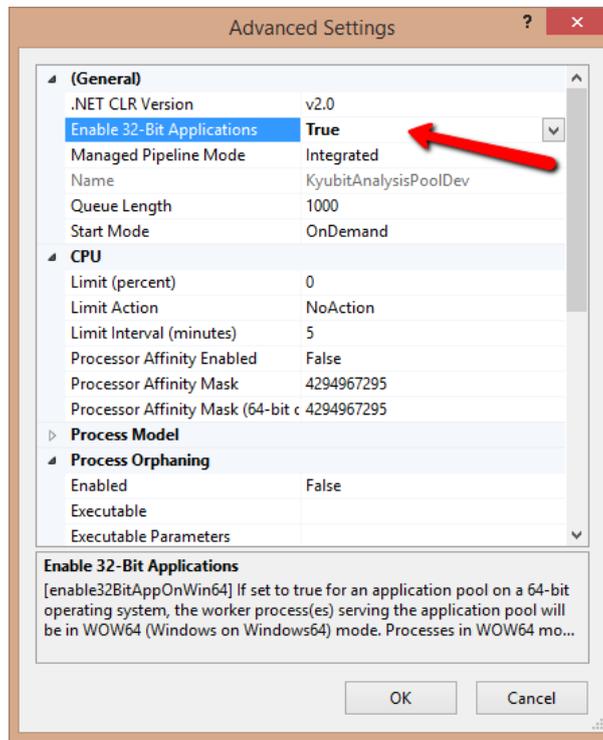




'Data Source Name' that is used for the ODBC connection on the operating system level, use to create new Data Source in Kyubit BI application.

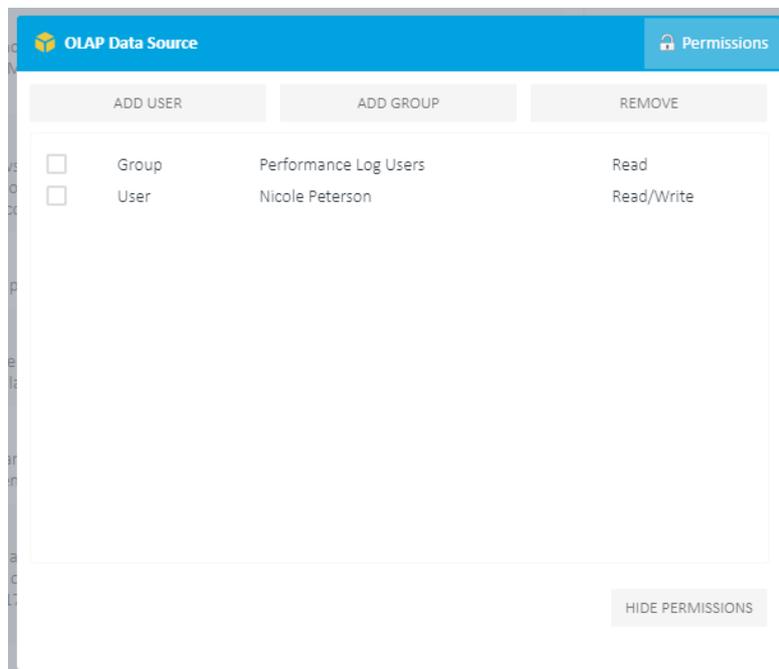


To set up an ODBC data source for MS Office applications, which are available only for 32-bit ODBC configuration, it is also required to configure Kyubit application to work in 32-bit mode. Open IIS Manager -> Application pools -> "KyubitAnalysisPool" -> Advanced Settings and set "Enable 32-bit application"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



2.3. Set 'Data Source' permissions

If the 'Data Source' should be visible to other users, click on the 'Permissions' options in the upper-right corner and add appropriate **Active Directory/Windows** or **Kyubit** 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)



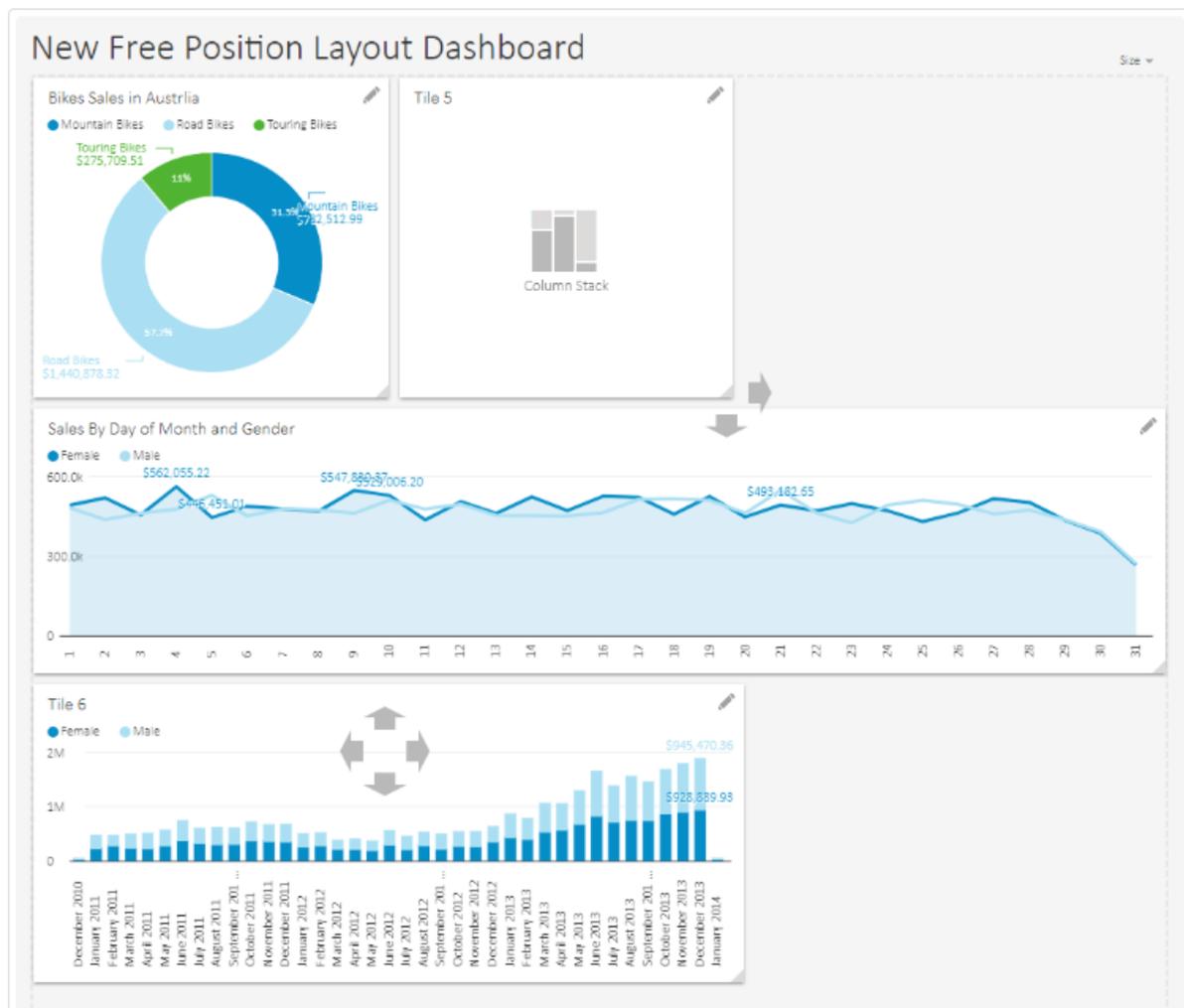
If a user does not have 'Read' permission on the data source, he will not be able to create new queries and analyses based on same 'Data Source', but he will be able to open dashboard with queries and analyses based on the same 'Data Source'.

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 a design view, ready to be designed and configured.

3.1. 'Free Position' based dashboard layout

The dashboard consists 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 a tile, click on the resizing handle (arrow) on the tile lower-right side. While moving around and resizing a particular tile, element size indicator is displayed on the lower-right side of tile element, indicating tile size in pixels, so a 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. Working with dashboard charts

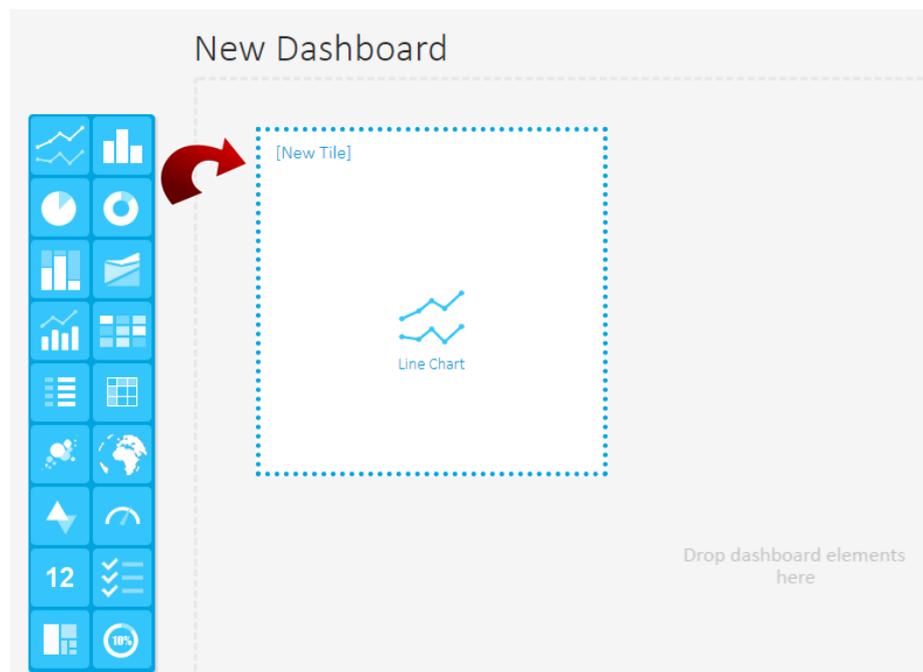
On every dashboard, user can choose to add more than 20 different charts and visualizations (tiles) that present some kind of data visualization. On the dashboard toolbar on the left, visualization (chart) types are presented with descriptive icons. On a dashboard tile, visualization type can be changed on Tile -> design -> 'Chart Type' attribute.



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

3.2.1. Add a tile to the dashboard

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

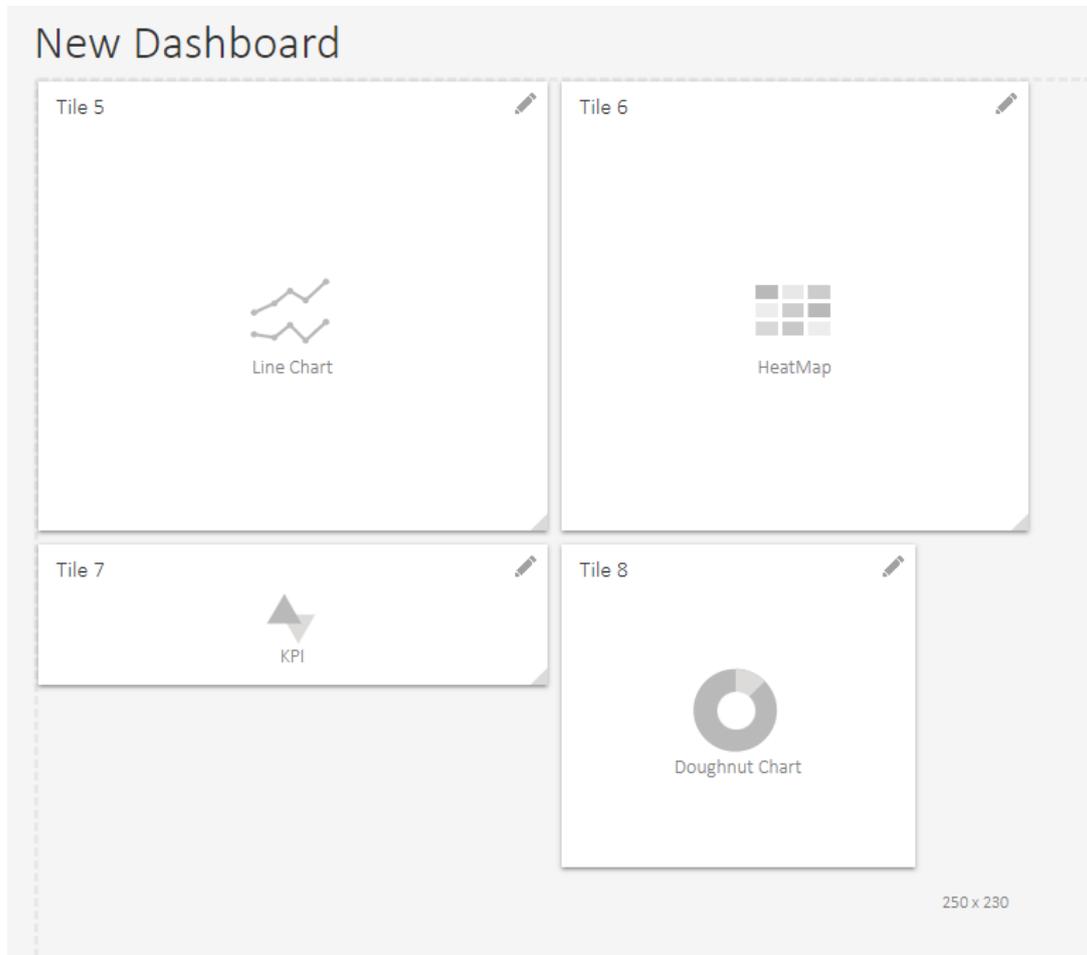


3.2.2. Remove tile from the dashboard

To remove tile (delete) from the dashboard, click on the dashboard tile **edit** icon and choose 'Delete' button.

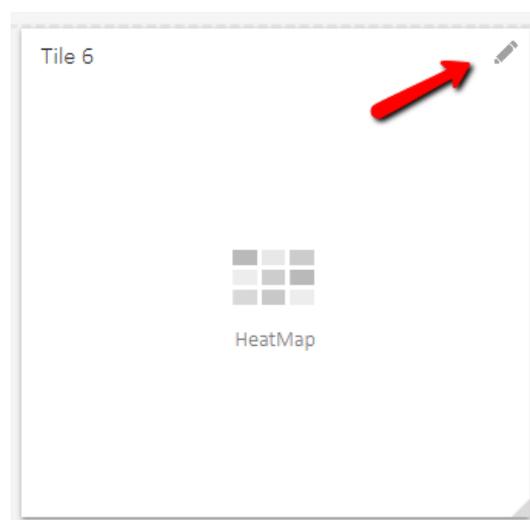
3.2.3. Rearrange tiles on the dashboard

At any time in the design view, tiles could be rearranged or moved to any position. Simply drag-and-drop tiles to preferred location or resize dashboard tile with resize handle on the lower right corner of the tile.



3.2.4. 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.

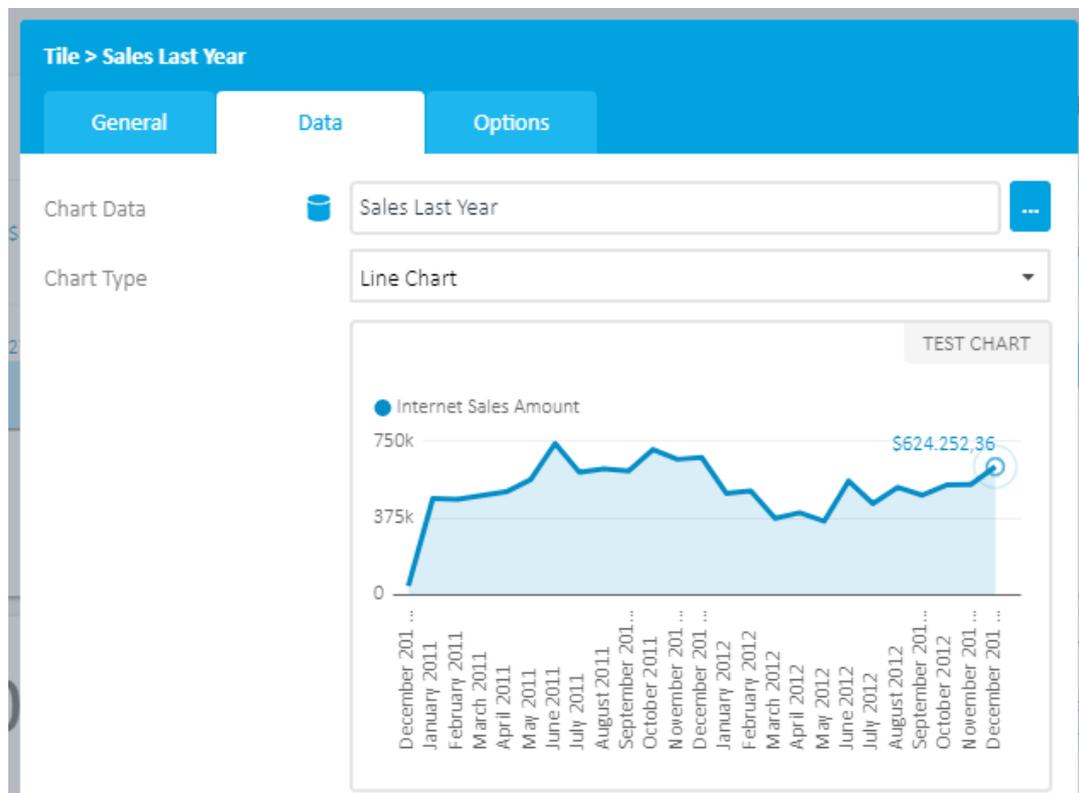


Enter dashboard general information: like **'Title'**, **'Description'** and, if you like, set **'Child dashboard'** that will be opened as a more detailed view of the same data, enabling users to have **'drill-down'** experience while using dashboards.

The screenshot shows the 'General' tab of a dashboard configuration form. The title is 'Tile > Sales Last Year'. There are three tabs: 'General', 'Data', and 'Options'. The 'General' tab is active. It contains the following fields:

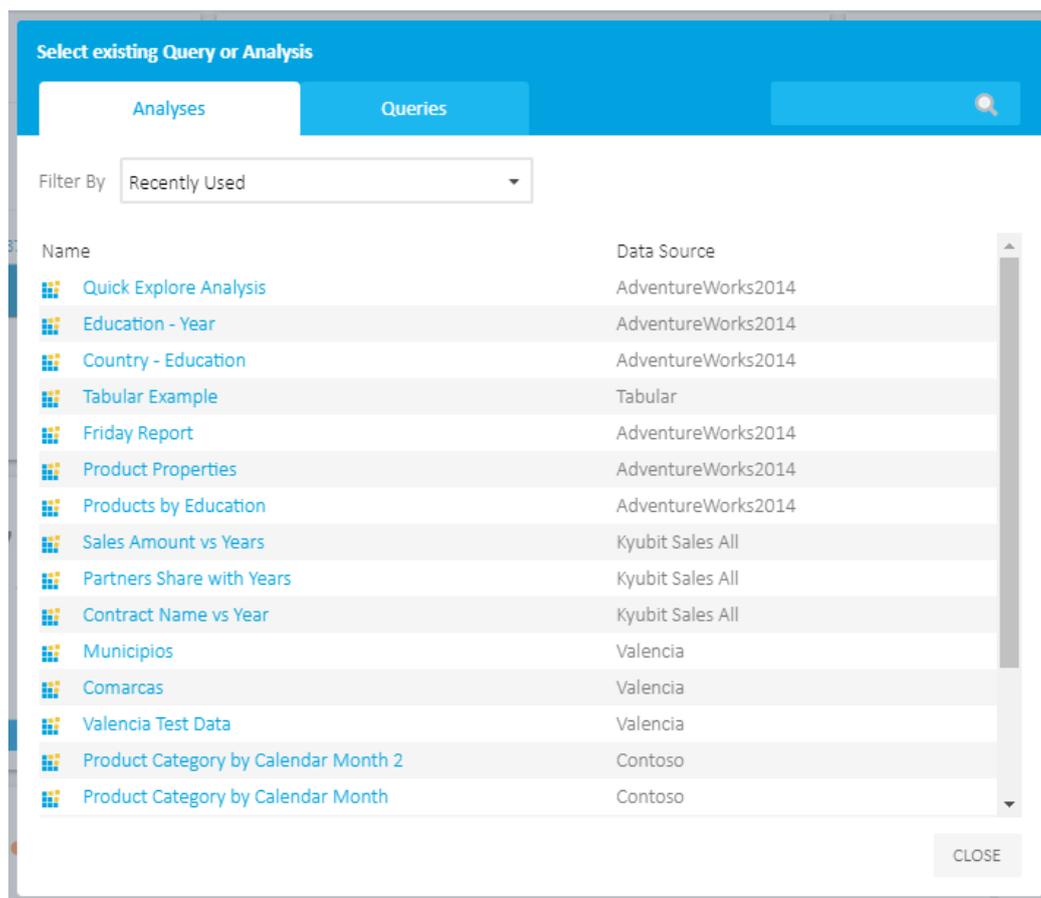
- Name:** A text input field containing 'Sales Last Year'.
- Description:** A large text area for entering a description, currently empty.
- Child Dashboard:** A dropdown menu with a '-' symbol, indicating no child dashboard is selected.

'Data' is second tab on the tile form, where data for visualization will be defined.

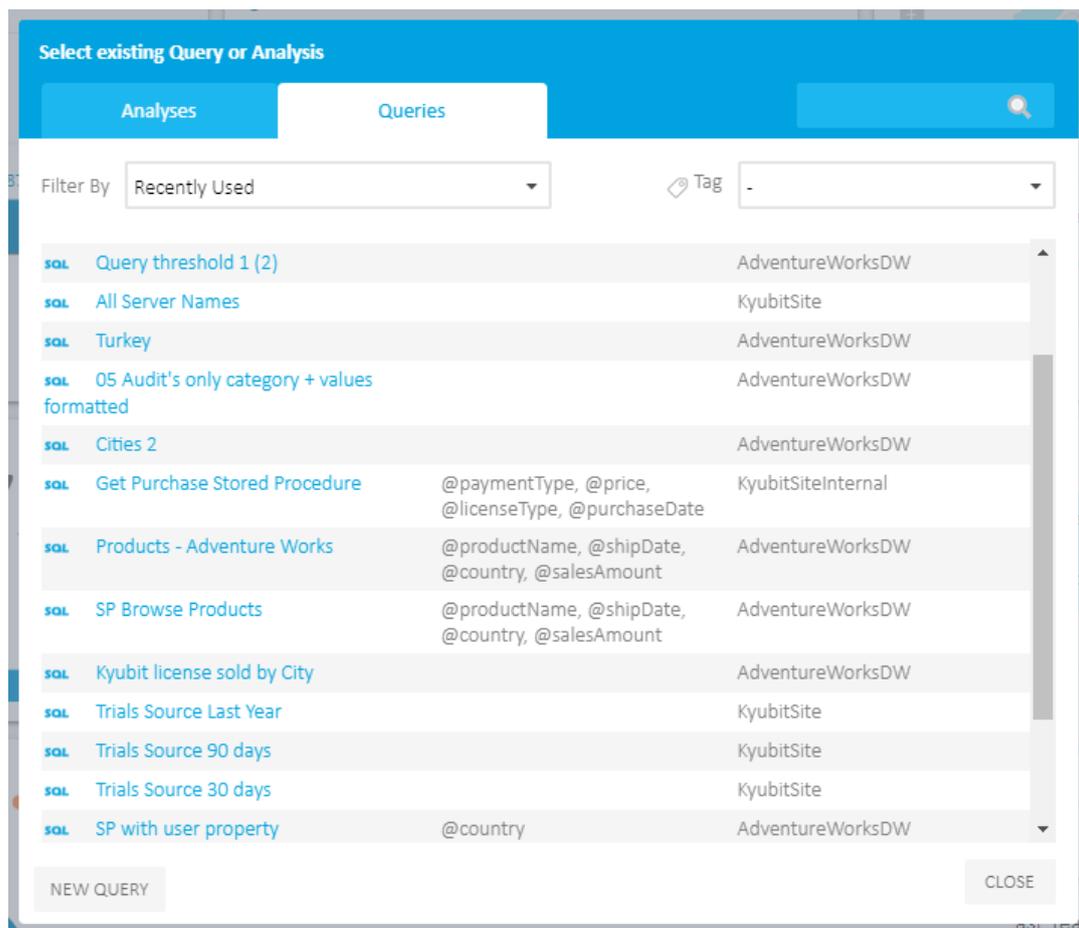


'**Chart Data**' is input where user selects existing Analysis or Query (TSQL or MDX) previously created in Kyubit BI application to retrieve data and show in this tile visualization ('Line chart' in this case). **Existing Analysis** means that analysis is created in 'Analysis' part of Kyubit Business Intelligence application (OLAP or 'Analytic Model' analysis) and that current user has at least permissions 'Read' permission on the folder containing the analysis. **Existing Query** (TSQL or MDX) means, that query is previously created in 'Dashboards' part of Kyubit Business Intelligence application and current user has at least 'Read' permissions on the folder containing the analysis. If the Query which user requires still does not exists in the application, a user could click on 'New' button immediately from tile form and create new MDX or TSQL query to be used on this tile chart/visualization. To select an existing analysis or query, click on the 'Select' button and selection form of existing Analyses and Queries will be displayed. Quickly find required analysis/query for chart visualization using the **Search** option or filtering by the particular data source or **Recently Used** view.

Analysis selection...



Query selection...

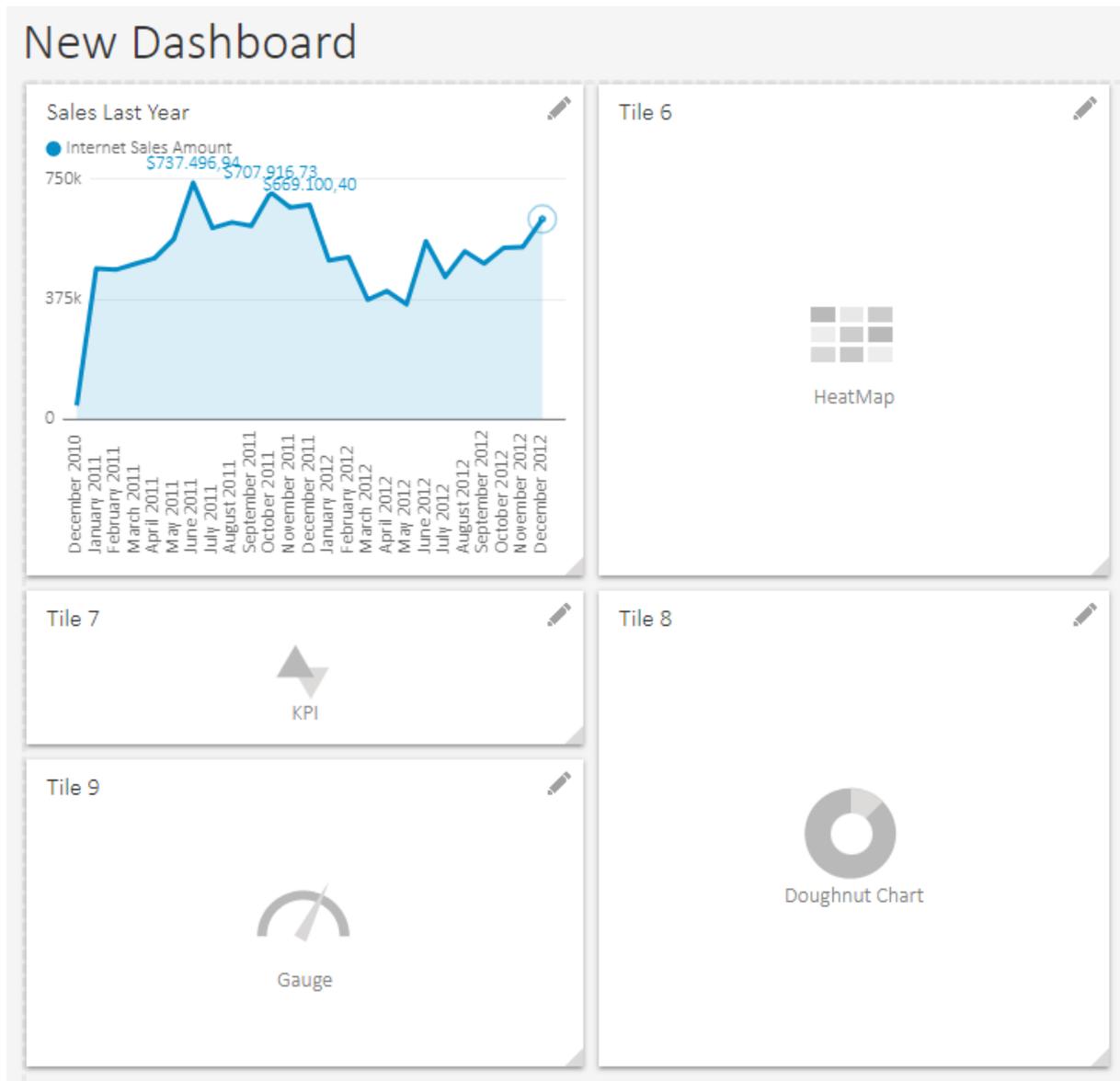


All analysis created within Kyubit BI application for which current user has at least 'Read' permission are displayed in selection form. Displayed list could be filtered by 'Data Source' for environments with many analyses. Same principles work for Query selection.

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

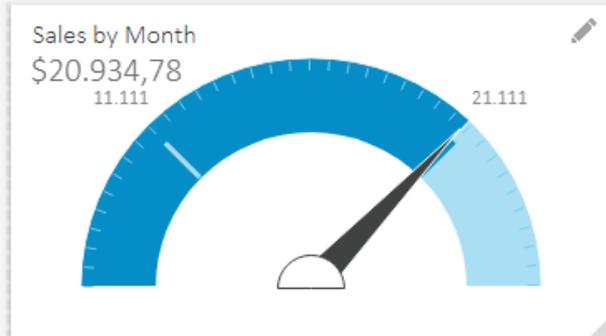
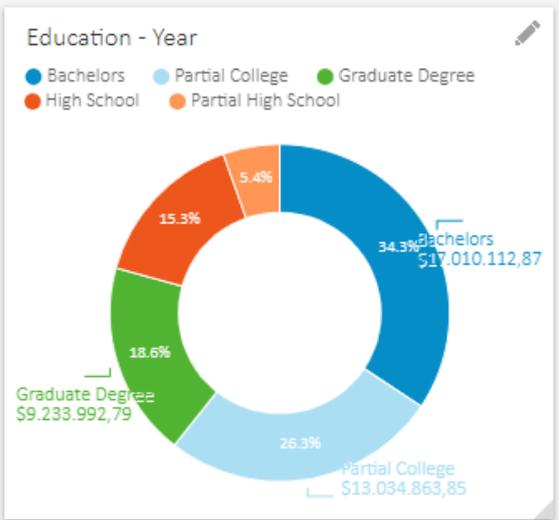
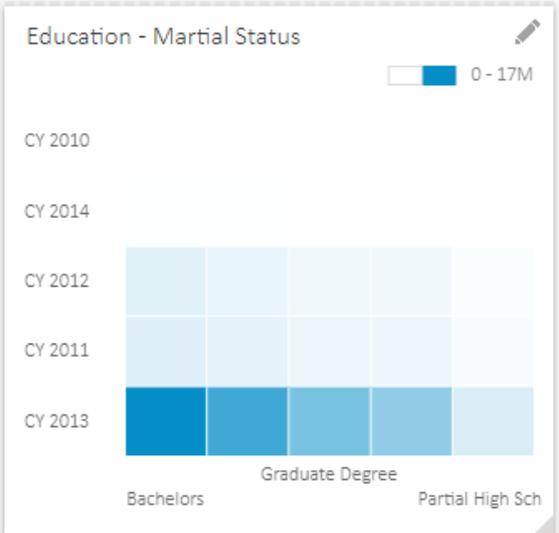
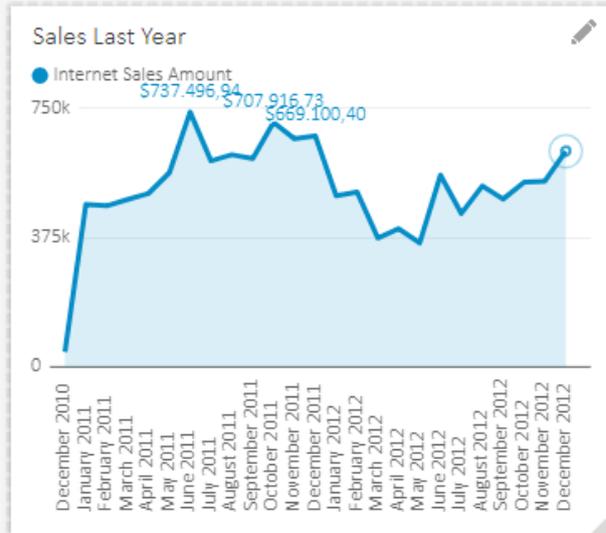
In tile configuration form, a user still can change tile (visualization) type, if concludes that given data is more appropriate to show with different chart type.

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



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

New Dashboard



3.3. Chart 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 a new data.

Tile > Sales Last Year

General | **Data** | Options

Name: Sales Last Year

Description: [Empty text area]

Child Dashboard: -

Tile Refresh: 2 Minutes

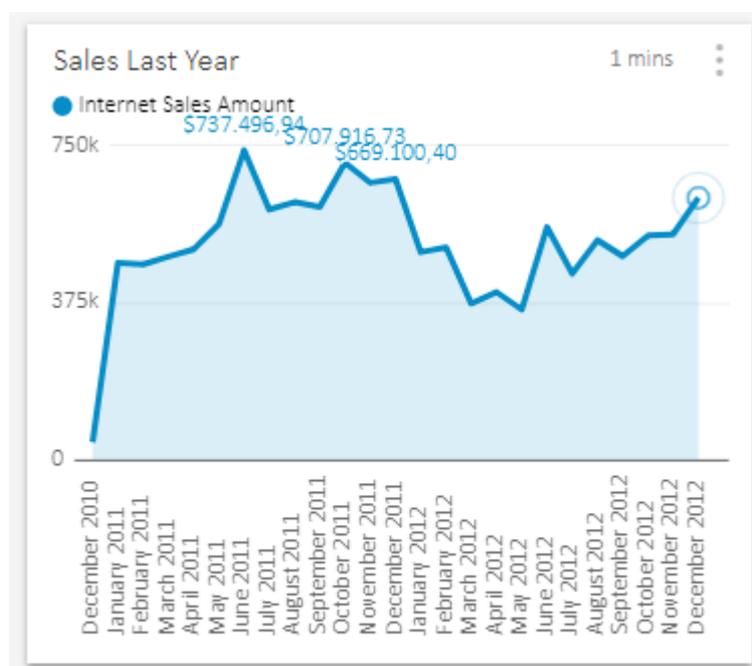
Show last refresh time

Open custom URL: [Empty text field]

Caching: 0 Minutes

OK CANCEL

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



3.4. Open custom URL in a context of dashboard data

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

The screenshot shows a configuration window for a dashboard tile named 'Sales Last Year'. The window has three tabs: 'General', 'Data', and 'Options'. The 'General' tab is active. The fields are as follows:

- Name: Sales Last Year
- Description: (Empty text area)
- Child Dashboard: -
- Tile Refresh: 2 Minutes
- Show last refresh time:
- Open custom URL: <http://www.adventureworks.com?details=1> (highlighted with a red arrow)
- Caching: 0 Minutes

Buttons for 'OK' and 'CANCEL' are at the bottom right.

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

For example:

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

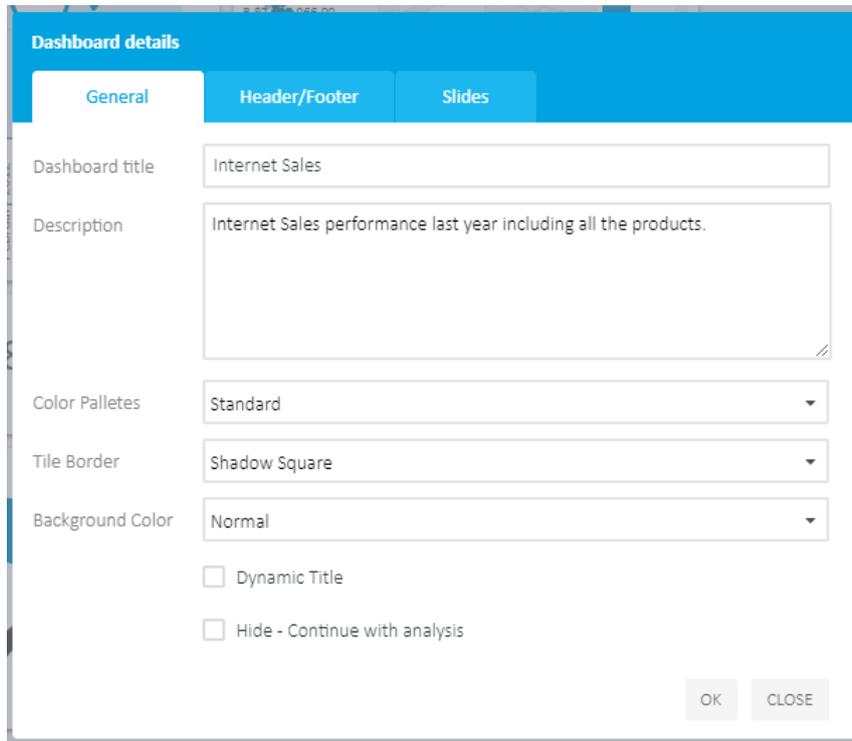
If the dashboard contains added OLAP filters, they will be also part of the create URL in a separate parameter.

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

If the 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".

3.5. Dashboard title, header and footer

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

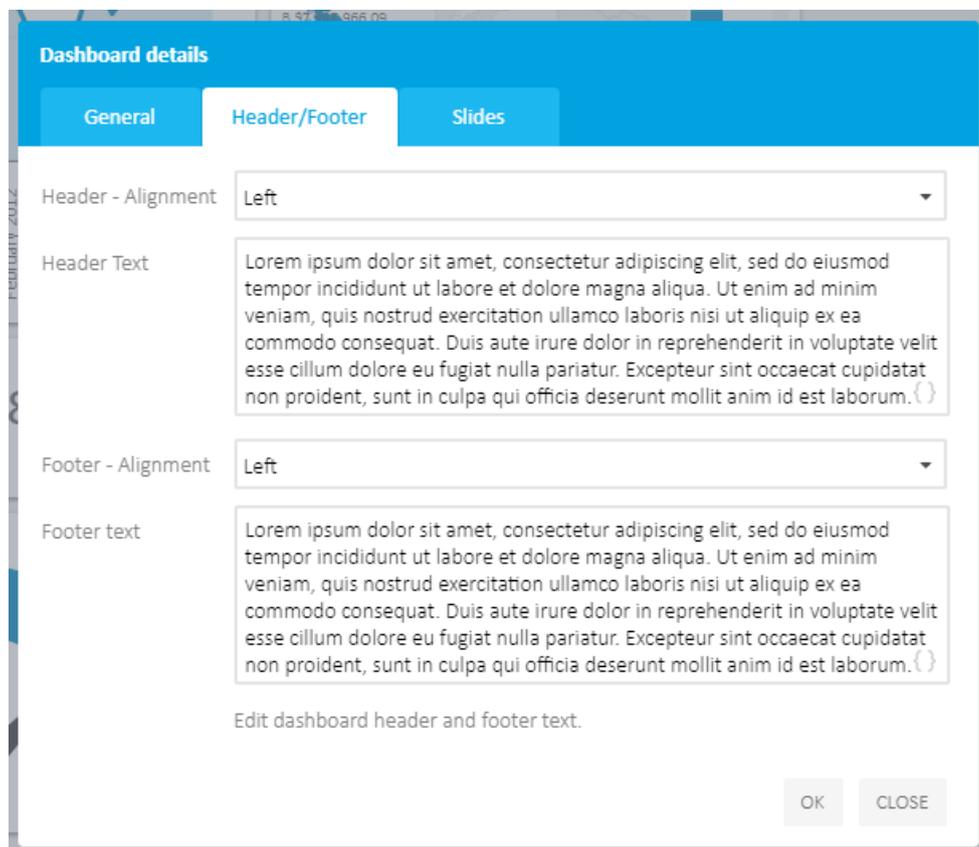


The screenshot shows the 'Dashboard details' dialog box with the 'General' tab selected. The fields are as follows:

Field	Value
Dashboard title	Internet Sales
Description	Internet Sales performance last year including all the products.
Color Palletes	Standard
Tile Border	Shadow Square
Background Color	Normal

There are also two checkboxes: Dynamic Title and Hide - Continue with analysis. At the bottom right are 'OK' and 'CLOSE' buttons.

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



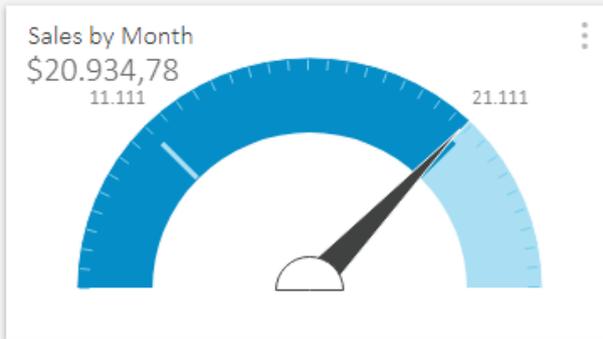
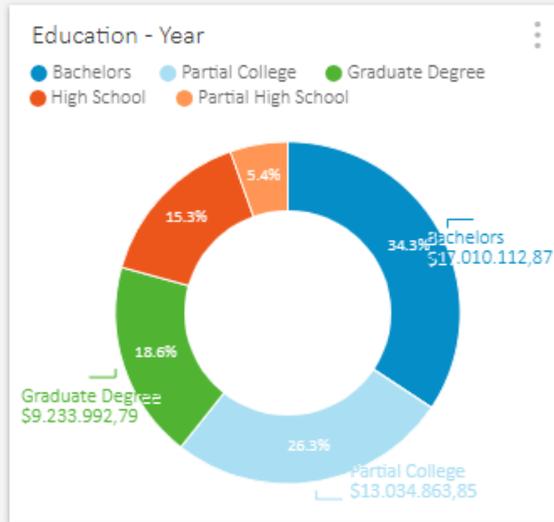
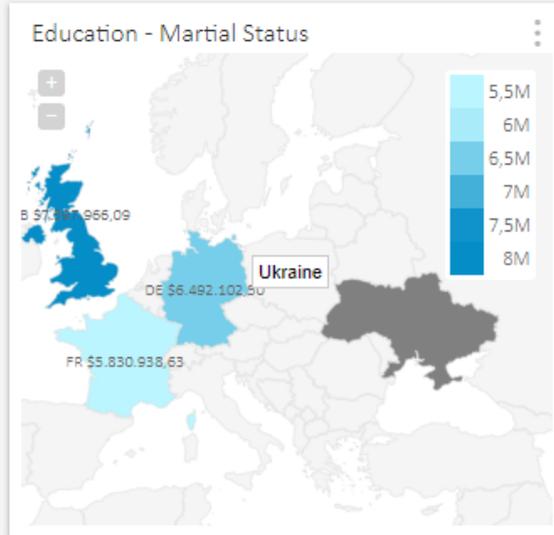
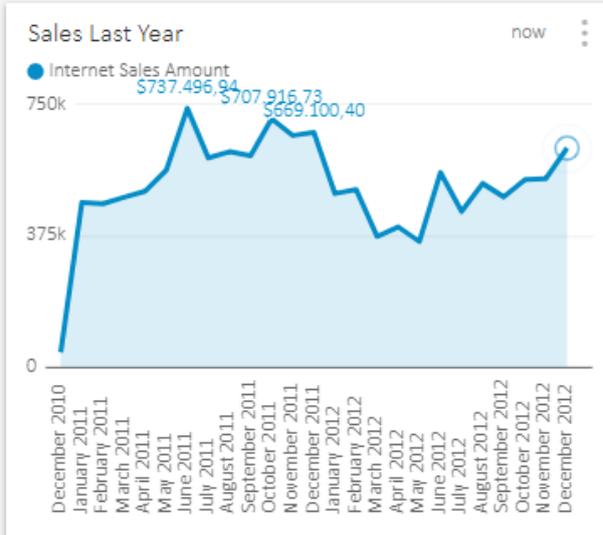
The screenshot shows the 'Dashboard details' dialog box with the 'Header/Footer' tab selected. The fields are as follows:

Field	Value
Header - Alignment	Left
Header Text	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. {}
Footer - Alignment	Left
Footer text	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. {}

At the bottom, there is a text label 'Edit dashboard header and footer text.' and 'OK' and 'CLOSE' buttons.

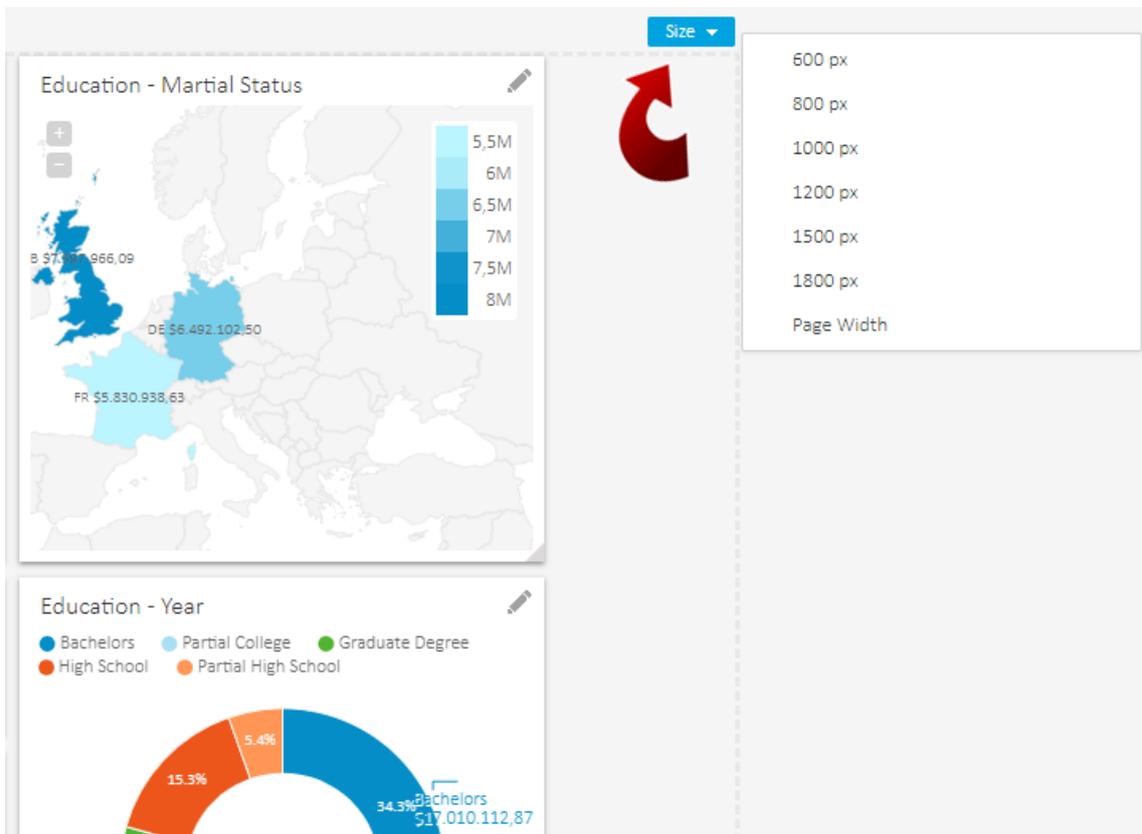
Internet Sales

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.



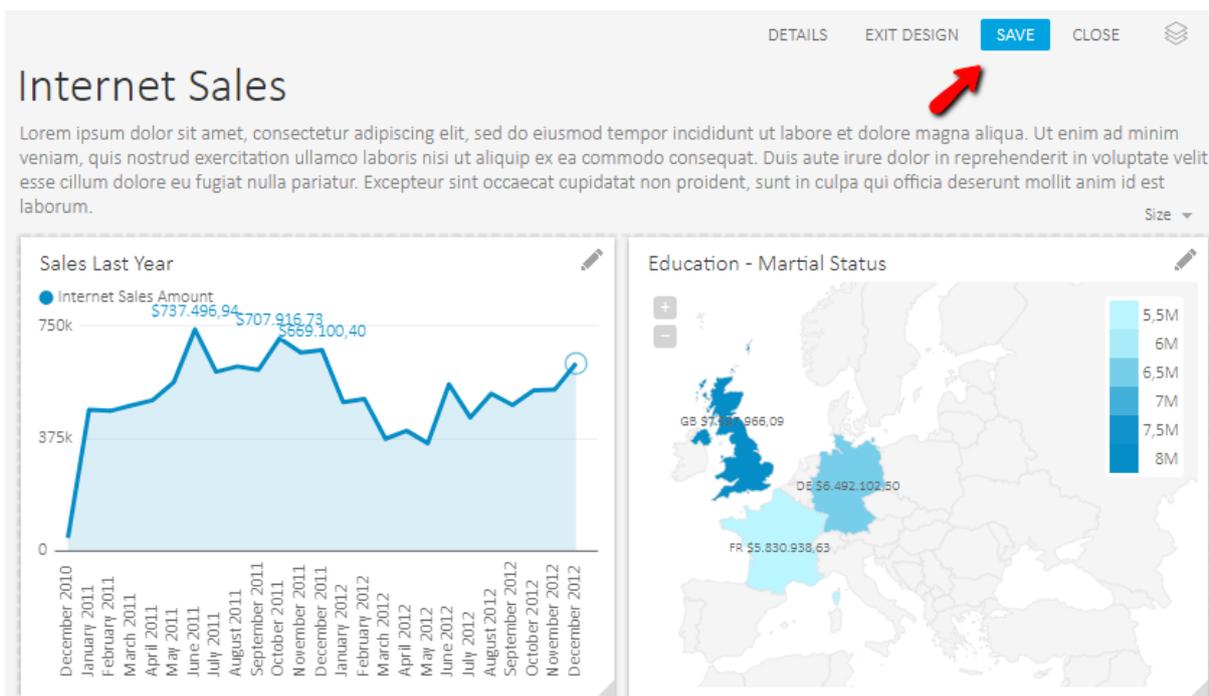
3.6. Manage dashboard area size

To change size (width) of the dashboard area, in the dashboard design mode select one of the predefined values on the **Size** menu.

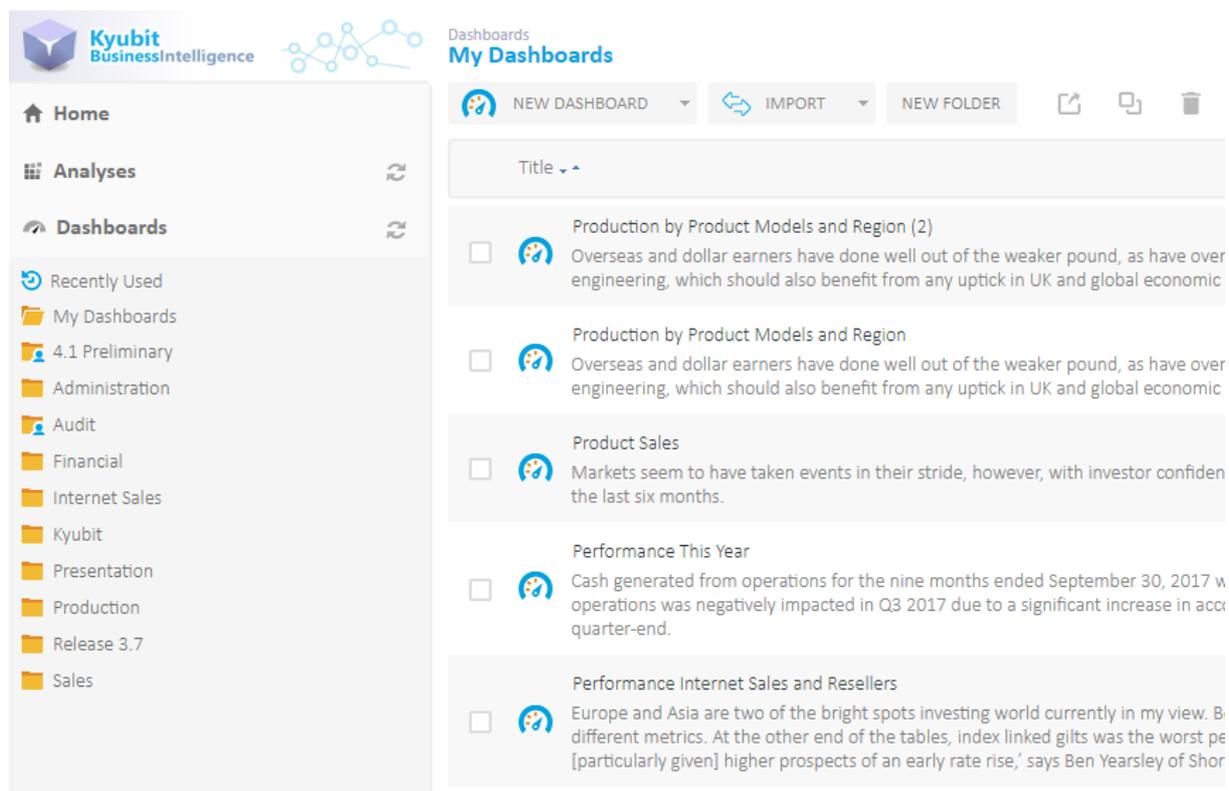


3.7. Saving the dashboard

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



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



3.8. Enter and exit 'Design view' for the dashboard

After the 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 (or with Administrator rights). While the user is not in a 'Design' view, the dashboard data, tiles and all dashboard arrangements are not available to change. 'Design' mode is just slightly visually different than 'Regular' view, so at the end of design, the user should 'Exit design' to see exactly how other users will see the dashboard while consuming prepared dashboard details.

3.9. 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 charts

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. The dashboard could display 2 groups of the visual elements, the chart and the Key Performance Indicators (KPIs).

Charts:

- **Line/Spline** chart, most appropriate to show time-related data.
- **Column** chart, most appropriate to show multiple series of data.
- **Pie/Doughnut** chart, most appropriate to show single data with one-series data.
- **List**, most appropriate to show an ordered list with names and numbers.
- **Geo Map**, most appropriate to show data related to geography (world countries and regions)
- **Bubble/Scatter** chart, most appropriate to show several measures for the same item
- **Area** chart
- **Stacked Column** chart
- **Column chart 100%**
- **Stacked Area** chart
- **Area chart 100%**
- **Combo** chart, most appropriate to compare values from 2 different sets of data
- **HeatMap** chart, most appropriate to visually identify patterns and highlights in your data
- **Card/Small Card**, quick insight into important values
- **TreeMap** chart, most appropriate to identify proportions
- **Table** chart, show data in rows and columns with various visual features

KPIs:

- Standard **KPI visualization** shows KPI icon, KPI value, last change and optionally a 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.
- **Goal Meter** presents KPI with circle visualization that describes expectation and result.

4.1. Data usage within tiles (Categories and series)

After drag-and-drop a tile to the dashboard, click on edit tile (Pen icon), choose dashboard title and select or create analysis/query that will feed current tile with data we would 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 accept only one series of values to visualize the data.

4.2. 'Analysis' data for the 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 present series. In this example, 'Country' presents categories, while '(Product) Subcategories' present series of values ('Mountain bikes' and 'Road Bikes').

Internet Sales Amount

Drop

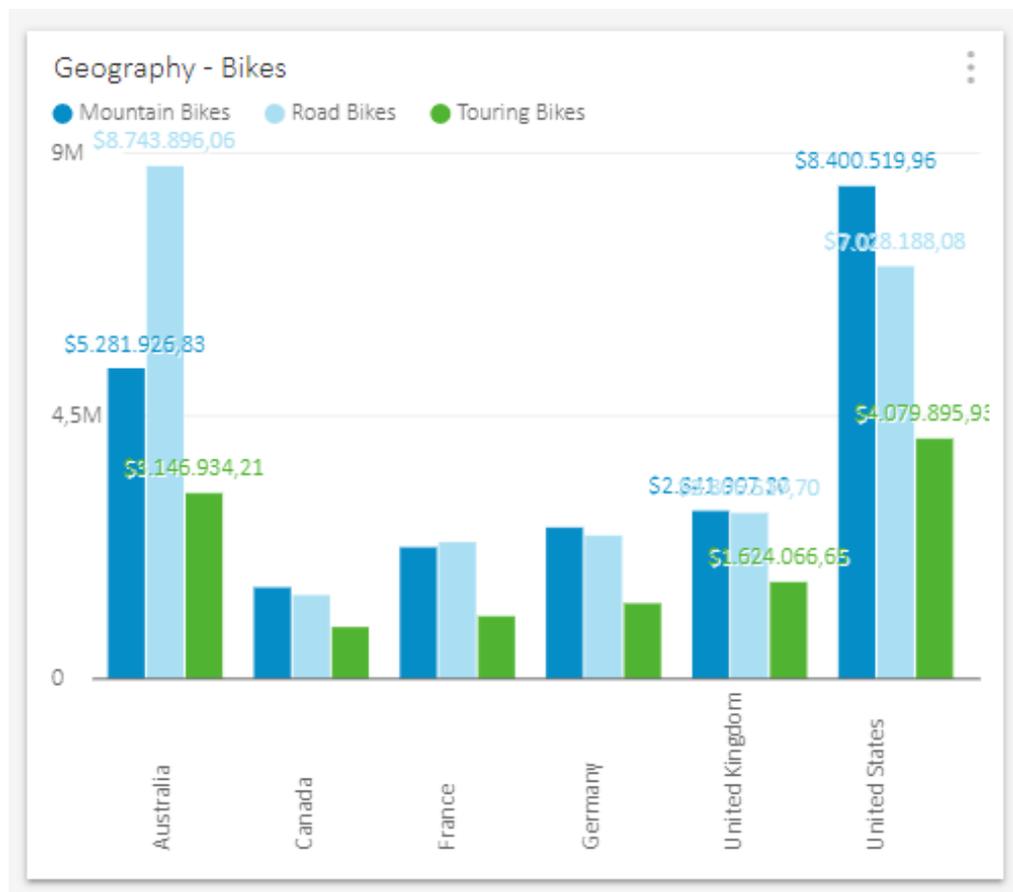
Categories (red box with arrow pointing to Country)

Series (red box with arrow pointing to Subcategory)

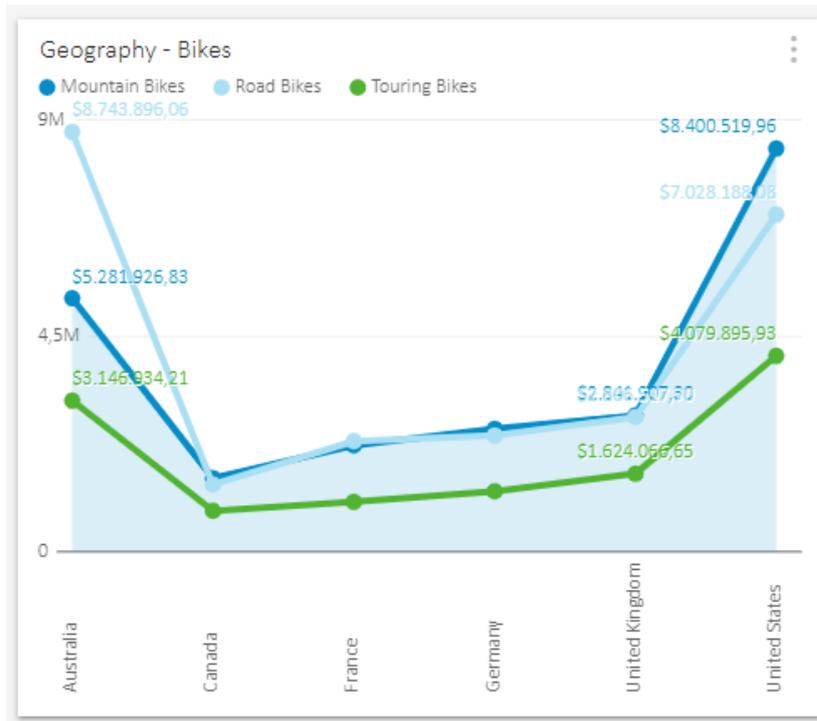
	Mountain Bikes	Road Bikes	Touring Bikes	Total
Country	Internet Sales Amount	Internet Sales Amount	Internet Sales Amount	Internet Sales Amount
Australia	\$5.281.926,83	\$8.743.896,06	\$3.146.934,21	\$17.172.757,10
Canada	\$1.530.511,34	\$1.396.239,98	\$850.078,15	\$3.776.829,48
France	\$2.218.824,80	\$2.302.615,67	\$1.039.208,43	\$5.560.648,89
Germany	\$2.557.675,16	\$2.419.676,54	\$1.257.322,35	\$6.234.674,04
United Kingdom	\$2.841.907,30	\$2.806.517,70	\$1.624.066,65	\$7.272.491,65
United States	\$8.400.519,96	\$7.028.188,08	\$4.079.895,93	\$19.508.603,98
Total	\$22.831.365,38	\$24.697.134,03	\$11.997.505,72	\$59.526.005,13

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

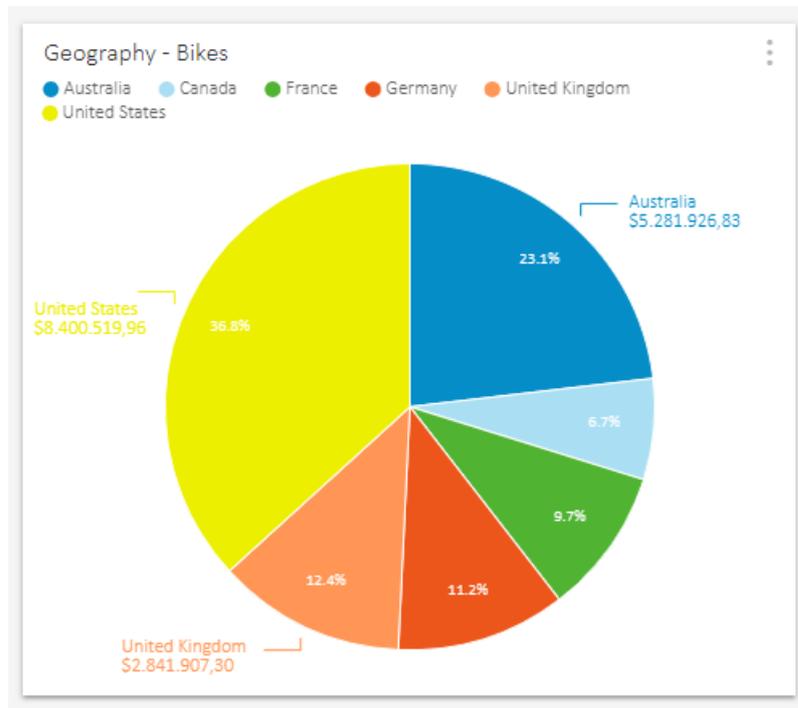
Column chart ...



Line chart...

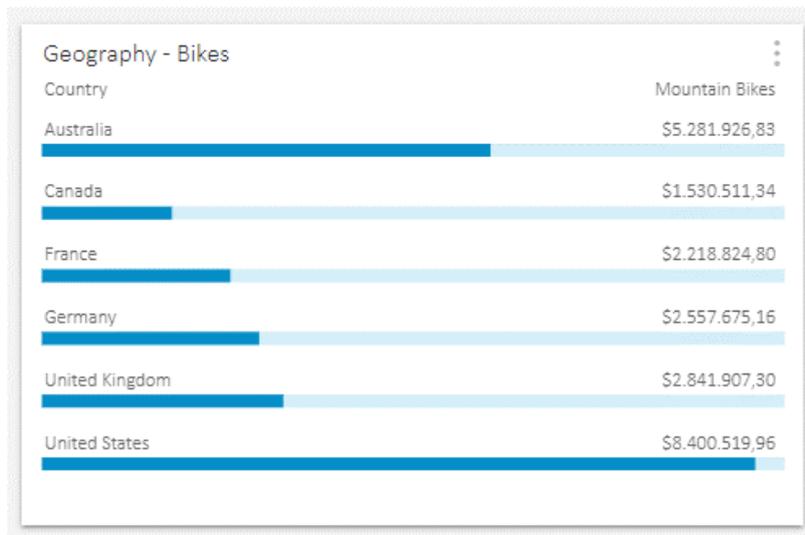


Pie Chart ...

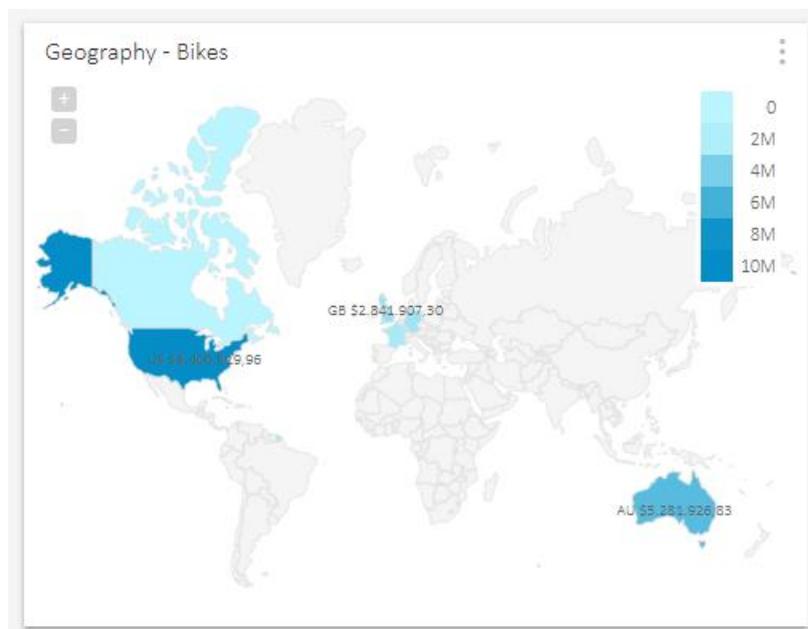


(Note: pie chart shows only first series)

List chart ...



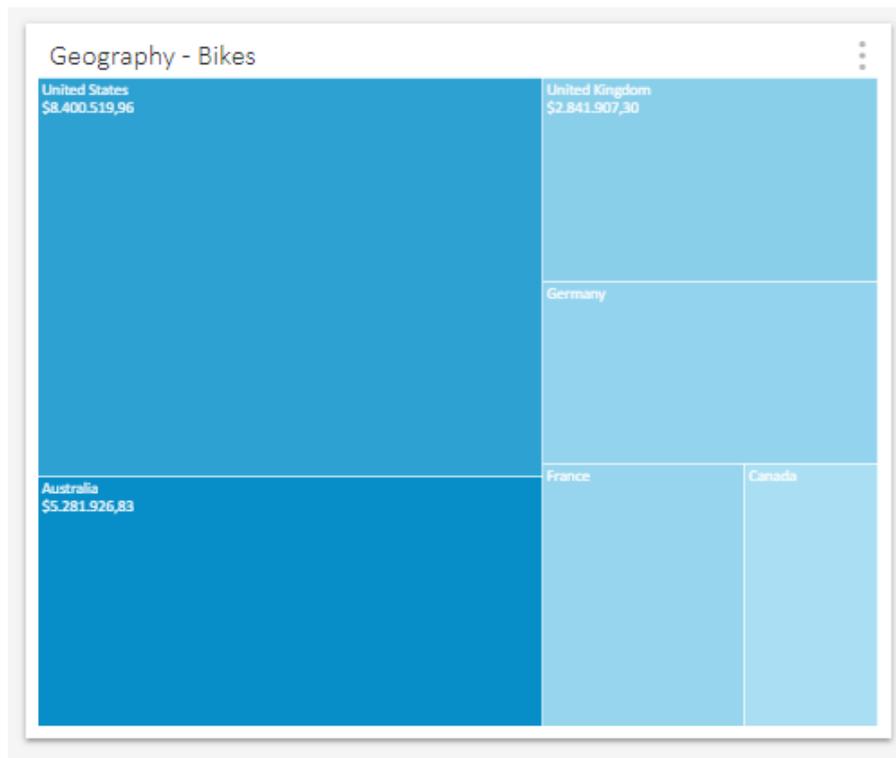
Geo map ...



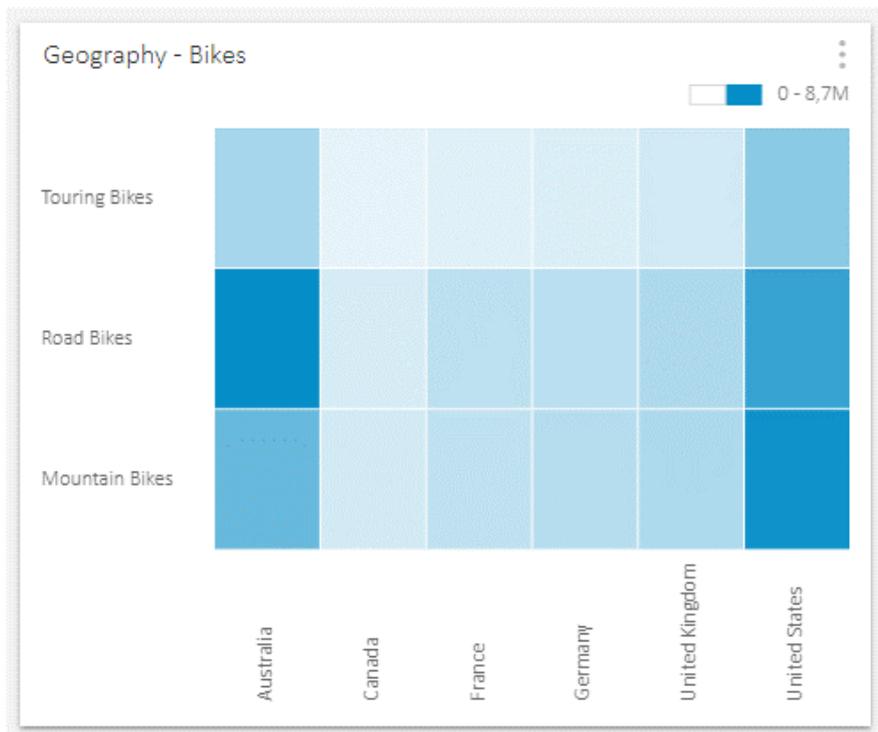
Data Table ...

Country	Mountain Bikes	Road Bikes	Touring Bikes
Australia	\$5.281.926,83	\$8.743.896,06	\$3.146.934,21
Canada	\$1.530.511,34	\$1.396.239,98	\$850.078,15
France	\$2.218.824,80	\$2.302.615,67	\$1.039.208,43
Germany	\$2.557.675,16	\$2.419.676,54	\$1.257.322,35
United Kingdom	\$2.841.907,30	\$2.806.517,70	\$1.624.066,65
United States	\$8.400.519,96	\$7.028.188,08	\$4.079.895,93

TreeMap chart ...



HeatMap chart ...



4.3. 'Geo maps' configuration and usage

'Geo Maps' displays data related to world countries, regions and locations (cities) in a geographical context. Geo maps are designed for quick visual perception of the data on the geographical map. To correctly relate retrieved data to 'countries' or 'regions', certain rules are expected. For countries, country names could be defined in the English language or using two-letter country codes (ISO 3166). 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 application supports 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 a detailed list of values that are supported when supplying data for Geo maps for various countries and regions.

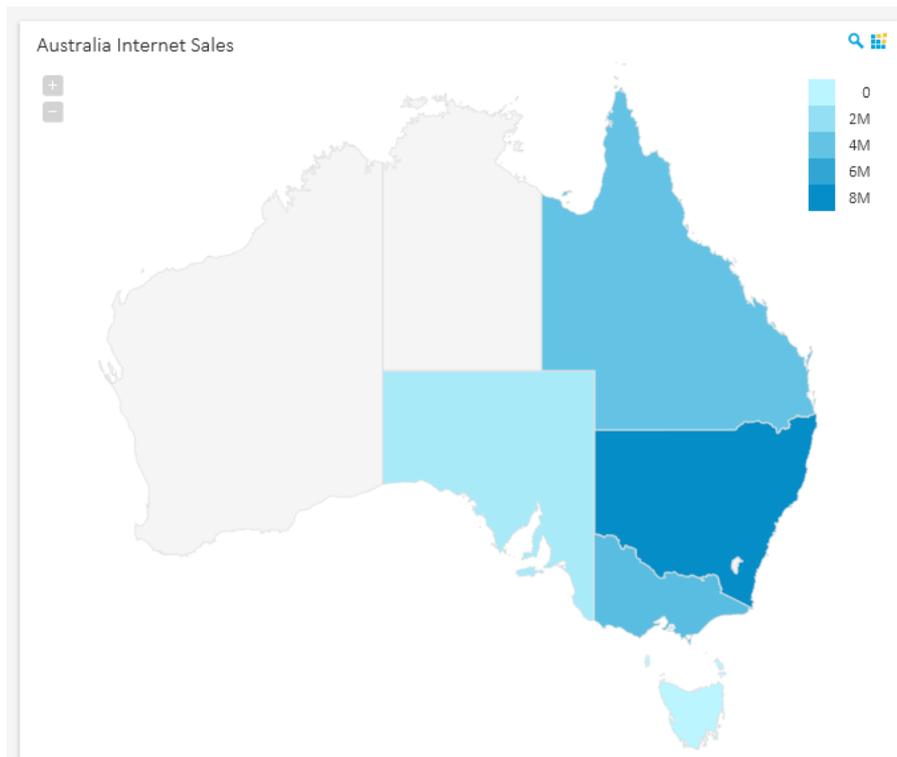
4.3.1. 'Color Gradient' geo map

Presents values from analysis or query results as a single-color gradient on the selected geo map. A simple way to visualize the influence of the selected values geographically.

Values ...

Drop Measures Here		Drop Series Here	
State-Province ▾		Internet Sales Amount	
+ New South Wales			\$7.783.612,65
+ Queensland			\$3.972.120,19
+ South Australia			\$1.188.941,66
+ Tasmania			\$443.500,04
+ Victoria			\$4.413.225,28
Total			\$17.801.399,82

Color gradient Geo Map ...



4.3.3. 'Geolocations' data on geo map

To display values related to cities or any other geographic locations related to your data, use data set 'Markers' defined in Tile -> Edit -> Options -> Markers section. Kyubit with setup automatically deploys 7300 largest cities in the world. If your data includes places and geolocation not included in the initial set of 7300 biggest cities, you can easily add locations in 'Geo Location Management' application section (explained in the 'Kyubit Administration and Configuration' user manual document).

Geolocations could be visualized with data from analysis or query using one or two measures. In this example, each measure 'Purchase Price' and 'Tax Amount' will be rendered using Geolocation to visually identify the impact of both values.

Values ...

Purchase Price			
Tax Amount			
Drop Measures Here			
		Drop Series Here	
City		Purchase Price	Tax Amount
Halwān		\$17.552.803	\$1.246.691
Montpellier		\$14.557.981	\$1.078.195
El Paso		\$14.234.578	\$1.183.321
Bergen		\$11.281.828	\$180.199
Nashville		\$11.041.520	\$820.809
Famagusta		\$10.841.754	\$636.837
Samagaltay		\$10.539.877	\$568.599
Vila		\$9.958.953	\$948.229
Lomé		\$9.950.847	\$527.794
Burgersfort		\$9.860.519	\$812.165
Müdiyah		\$9.857.185	\$813.567
Mushie		\$9.816.994	\$253.052
Cikalaces		\$9.806.268	\$148.131
Mubo		\$9.802.842	\$201.629
Sekampung		\$9.797.287	\$180.073
Venda do Valador		\$9.794.261	\$880.659
Chilly-Mazarin		\$9.781.007	\$530.094
Jarash		\$9.771.188	\$446.361

Configuration ...

Tile > Car Sales Analysis

General
Data
Options

Color Palletes Inherit From Dashboard ▼

Pivot

Specific Categories ...

Value Labels None ▼

Value Labels - Categories ...

Dominant Series Colors

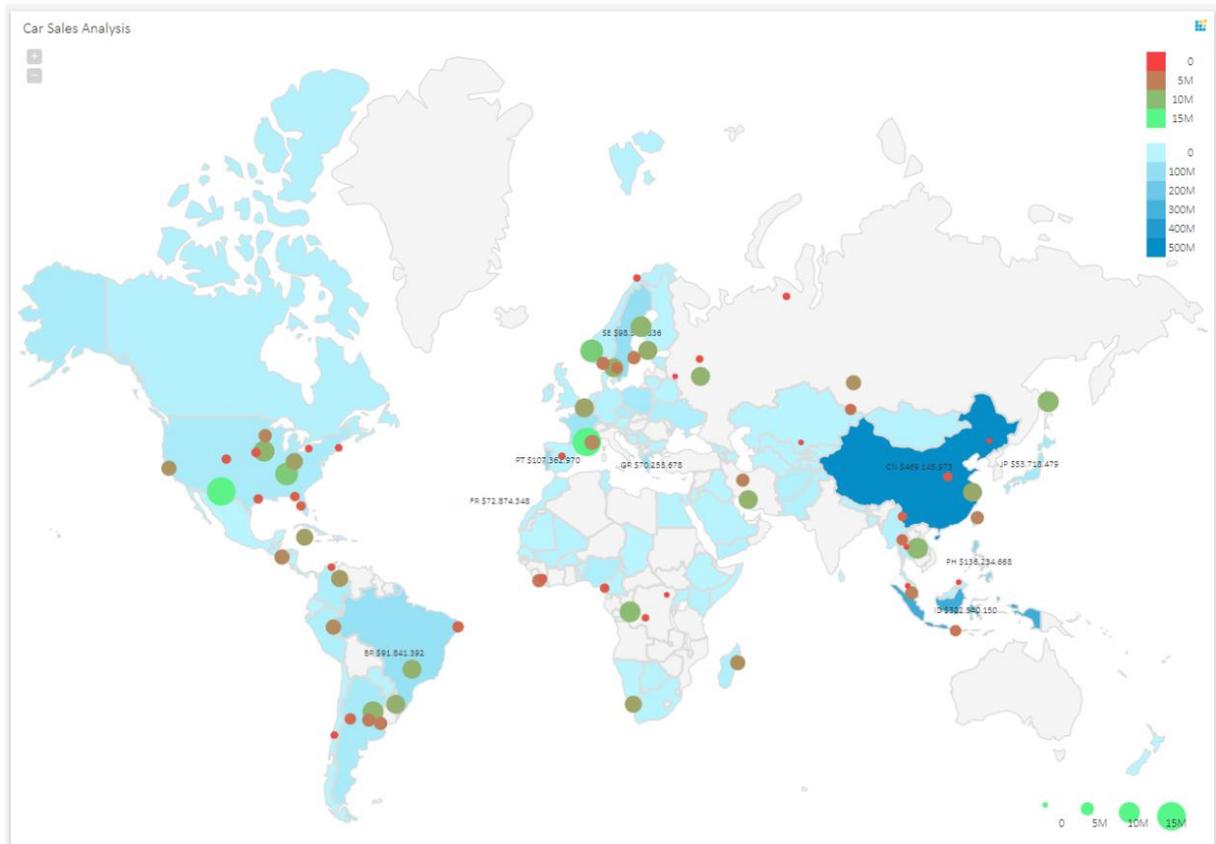
Markers Car Sales Analysis 3 ...

Markers - Colors Measure 1 ▼ Low High Legend None ▼

Markers - Radius Measure 1 ▼ Low 3 High 15 Legend None ▼

Find more [information](#) on Geo markers usage and management.

Geo map chart results ...



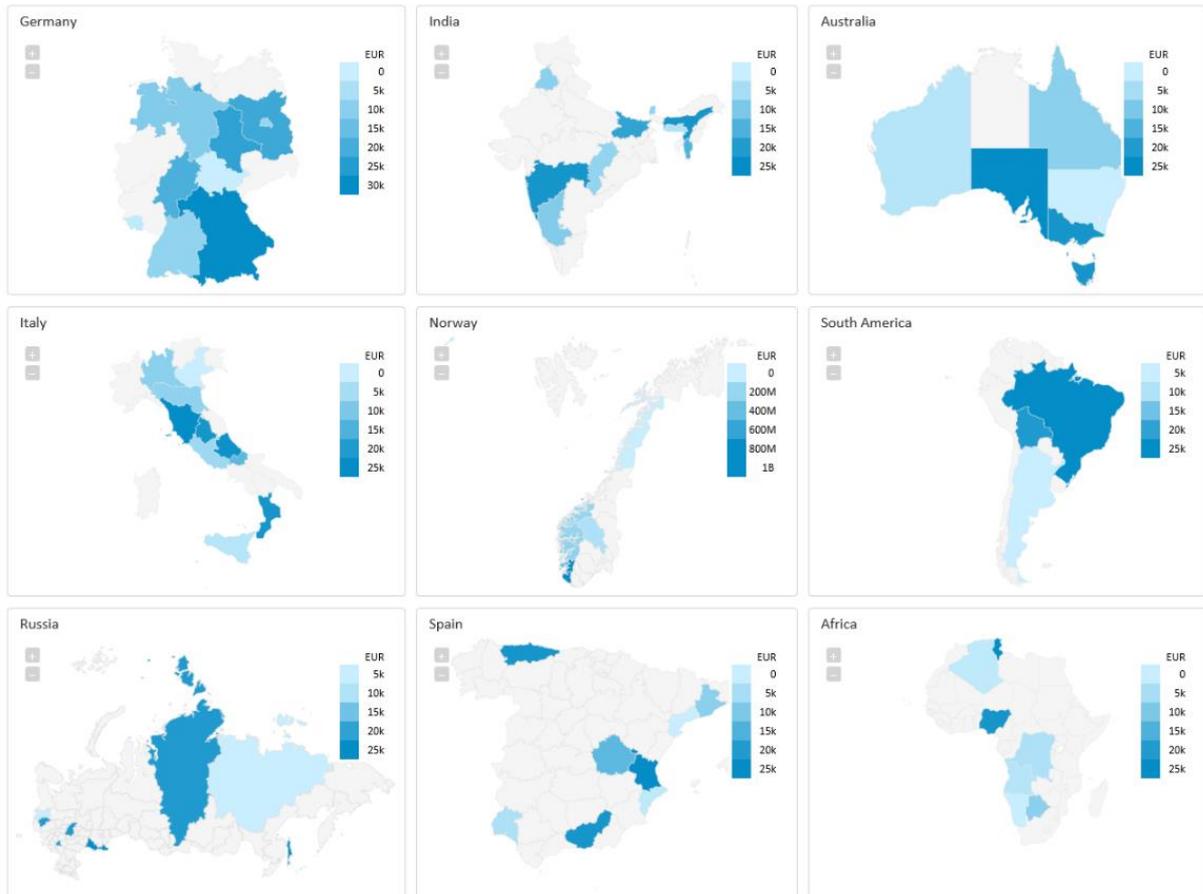
Please, contact support@kyubit.com for additional maps.

4.3.4. Drill-down geo map data

If Geo map uses OLAP/Analytic Model data, Geo map tile has the option to drill-down geo map areas to its child geo map representation. Continents are drill-down to countries, countries are drill down to regions. Analyzing geodata on the dashboard becomes perceptual and comprehensive. Within few clicks users isolates and observes data in the geographical form, that could be easily exported to PDF file or share with other users.



With every new version of Kyubit Business Intelligence application, more countries and regions are available to use by Geo Maps feature on the dashboards. All continents and largest countries with their regions are available, but also Kyubit will provide Geo maps for other countries and regions of your interest. Please, contact us for more details when country or region of your interest will be available.



4.4. 'Table' chart visualization

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

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 an unlimited number of columns and rows and appropriate scrollbars 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 the table chart **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.

Products from AdventureWorks

Customer Alternate Key Name	Email and English - Spanish education	English, Spanish and French education	Phone, Address and Commute Distance	YearlyIncome
Jon Yang AIW00011000	jon24@adventure-works.com Bachelors Licenciatura	Professional Professional Cadre	3761 N. 14th St.1 (11) 500 555-0162.1-2 Miles	90000.0000
Eugene Huang AIW00011001	eugene10@adventure-works.com Bachelors Licenciatura	Professional Professional Cadre	2243 W St.1 (11) 500 555-0110.0-1 Miles	60000.0000
Ruben Torres AIW00011002	ruben35@adventure-works.com Bachelors Licenciatura	Professional Professional Cadre	5844 Linden Land.1 (11) 500 555-0184.2- 5 Miles	60000.0000
Christy Zhu AIW00011003	christy12@adventure-works.com Bachelors Licenciatura	Professional Professional Cadre	1825 Village Pl.1 (11) 500 555-0162.5-10 Miles	70000.0000
Elizabeth Johnson AIW00011004	elizabeth5@adventure-works.com Bachelors Licenciatura	Professional Professional Cadre	7553 Harness Circle.1 (11) 500 555-0131.1- 2 Miles	80000.0000

Products Australia
Companies with a lot of exposure to international revenues or assets also benefit from them they also have higher over

Table Chart

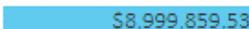
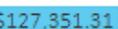
Country	Accessories	Bikes	Clothing
Australia	\$133,337.20	\$8,852,050.00	\$67,105.66
Canada	\$96,979.01	\$1,821,302.39	\$50,105.84
France	\$61,041.93	\$2,553,575.71	\$26,205.01
Germany	\$59,748.56	\$2,808,514.35	\$22,771.60
United Kingdom	\$74,246.09	\$3,282,842.66	\$30,909.82
United States	\$245,035.82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

'Table' chart samples...

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

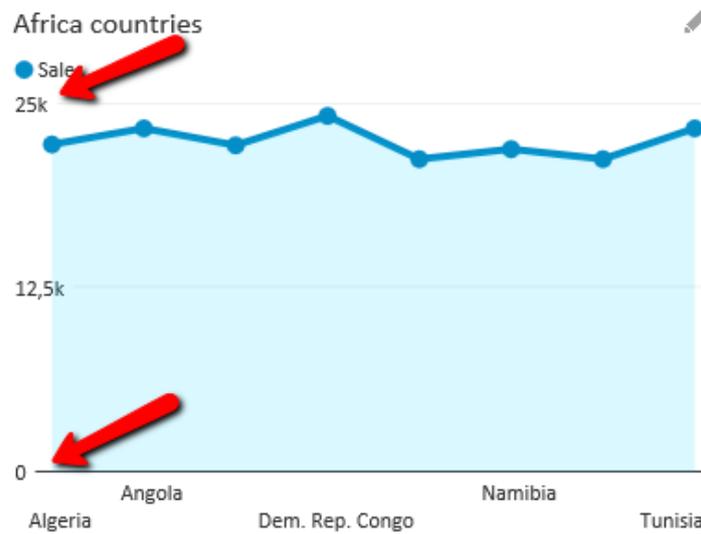
Table Chart 

Country ▾	Accessories ▾	Bikes ▾	Clothing ▾
Australia	 \$133,337.20  \$8,852,050.00  \$67,105.66		
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' 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. 'Min Y' and 'Max Y' on Line, Spline and Column charts

All dashboard charts automatically calculate what is the Y-axis, min and max values to show. Line, Spline and Column charts have the 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.

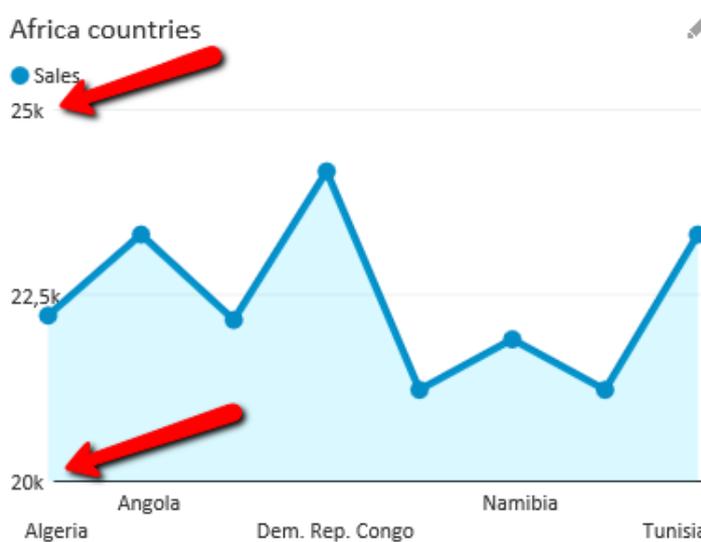
Tile > Africa countries

General Data Options

Min Y Value

Max Y Value

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



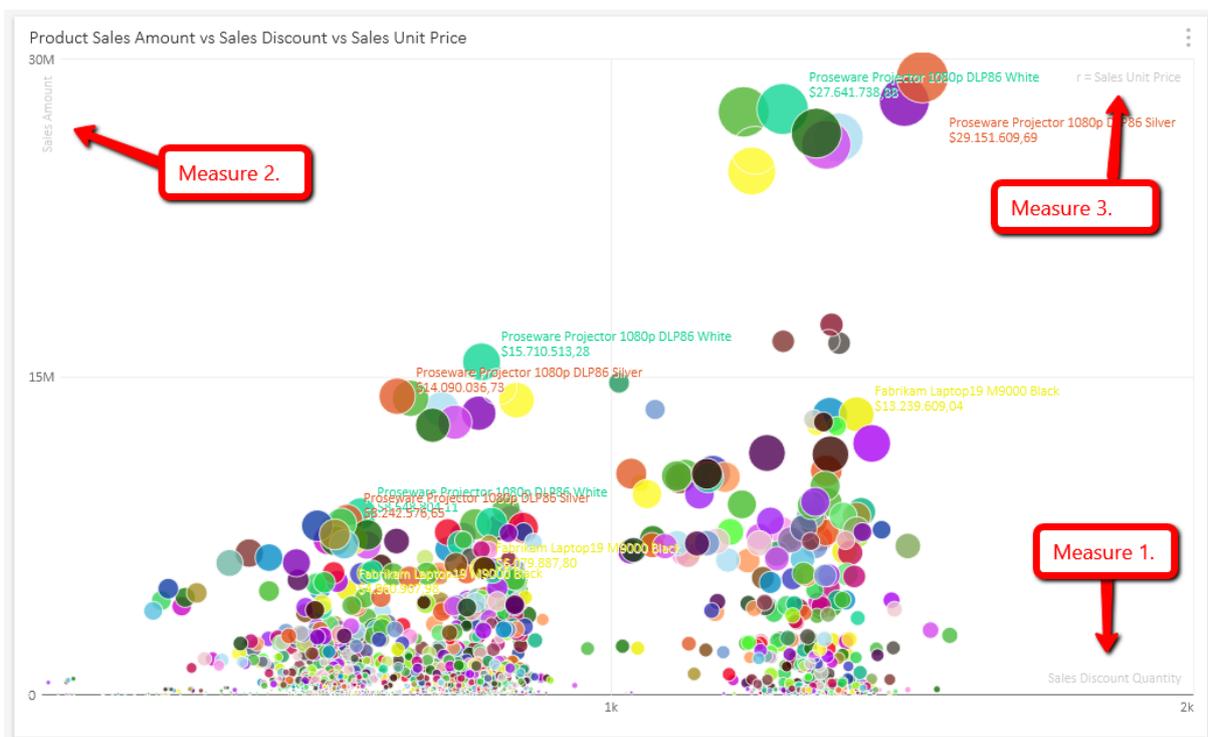
4.6. 'Bubble/Scatter' chart specifics

For an analysis that contains 2 or 3 measures, 'Bubble/Scatter chart' can visualize all measures, first as the position on X-axis, second as the position on Y-axis, while the third measure is rendered as a bubble size, to get quick insight to related data impact.

2 or 3 measure values ...

Product [Projectors & Screens]			
Drop Filters Here			
<ul style="list-style-type: none"> Sales Discount Quantity Sales Amount Sales Unit Price 			
Drop Measures Here			
	Drop Series Here		
Product Name	Sales Discount Quantity	Sales Amount	Sales Unit Price
Proseware Projector 1080p LCD86 Black	2641	\$46.883.476,35	\$4.128.705,00
Proseware Projector 1080p DLP86 Black	2407	\$49.266.460,53	\$4.380.747,00
Proseware Projector 720p LCD56 Black	2225	\$13.749.623,58	\$1.135.875,00
Proseware Projector 720p DLP56 Black	2460	\$20.245.853,88	\$1.664.334,00
Proseware Projector 480p LCD12 Black	2762	\$4.948.369,40	\$411.971,00
Proseware Projector 480p DLP12 Black	2743	\$10.803.320,06	\$897.202,00
Proseware Screen 125in X1609 Black	326	\$1.378.418,31	\$118.422,00
Proseware Screen 113in X1609 Black	1240	\$2.805.678,46	\$234.117,00
Proseware Screen 106in M1609 Black	1349	\$2.496.526,32	\$209.083,00
Proseware Screen 100in M1609 Black	2718	\$3.833.464,70	\$341.050,00
Proseware Screen 85in E1010 Black	2786	\$2.786.214,69	\$247.142,00
Proseware Screen 80in E1010 Black	2593	\$2.281.536,77	\$199.034,00
Proseware Projector 1080p LCD86 White	2734	\$47.504.870,55	\$4.034.610,00
Proseware Projector 1080p DLP86 White	2640	\$51.901.056,27	\$4.615.653,00
Proseware Projector 720p LCD56 White	2525	\$14.552.956,32	\$1.210.668,00
Proseware Projector 720p DLP56 White	2386	\$20.684.434,86	\$1.726.272,00
Proseware Projector 480p LCD12 White	2644	\$4.875.604,65	\$409.681,00

Measure values rendered on Bubble/Scatter chart ...



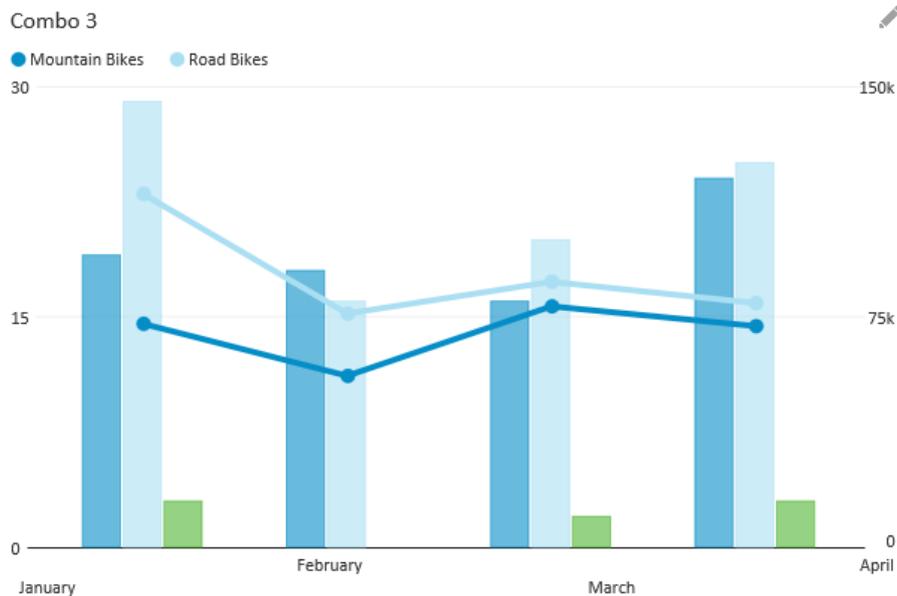
4.7. 'Combo' chart

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. The 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.

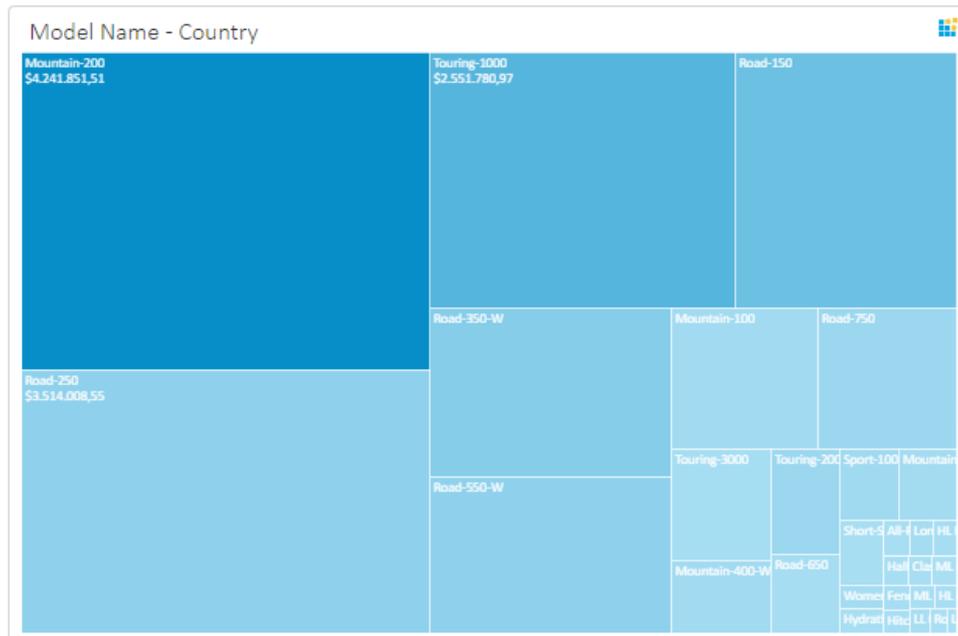
Configure data set to compare ...

Compared sets on the Combo chart ...



4.8. 'TreeMap' chart

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



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

Display colors for second series

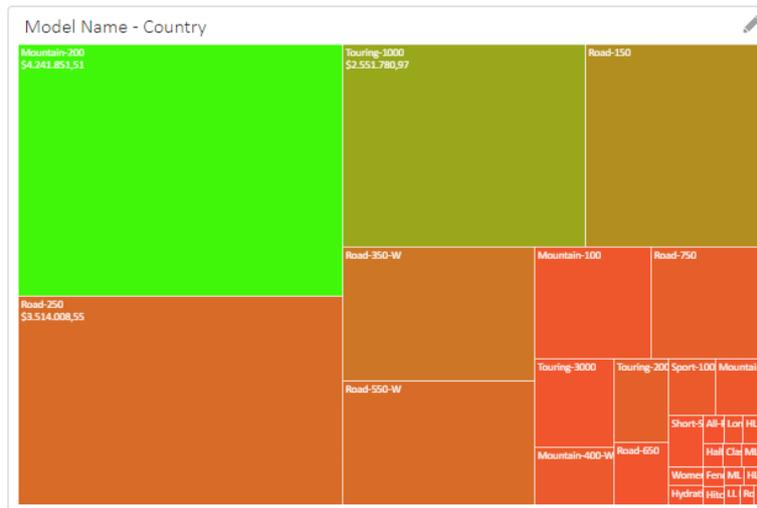
Color - Low

Color - HighColor - High

X

#3ff908

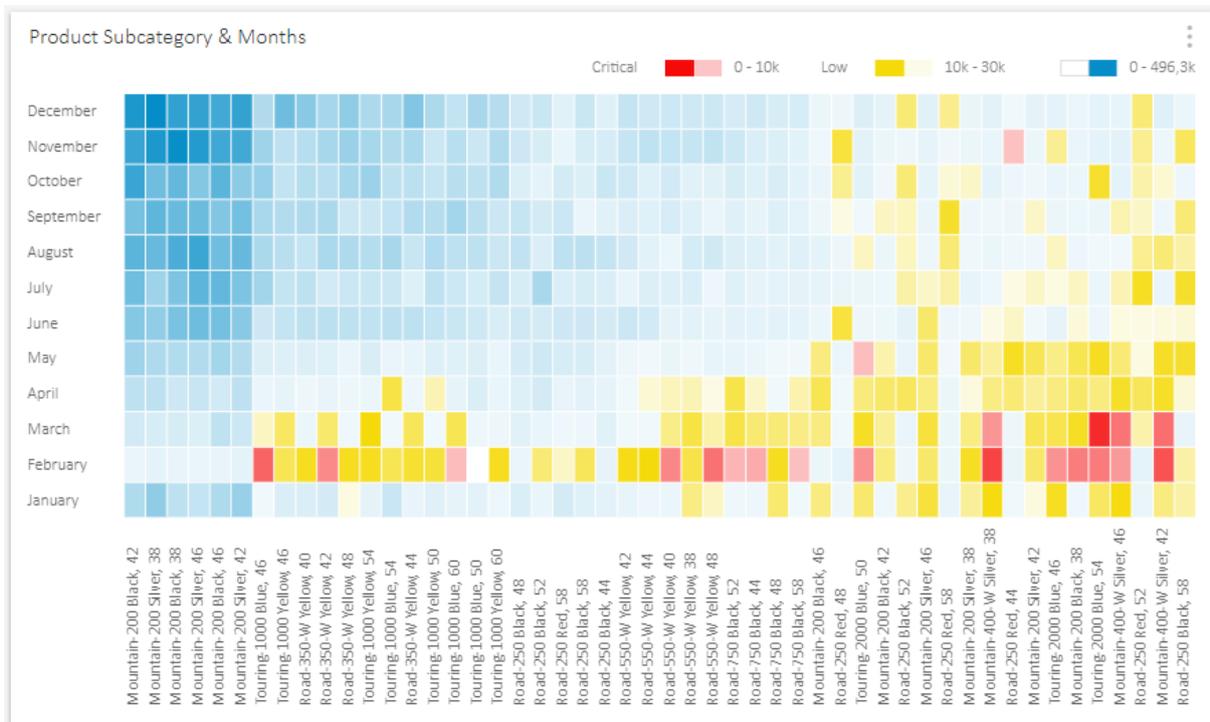
Cancel
Select



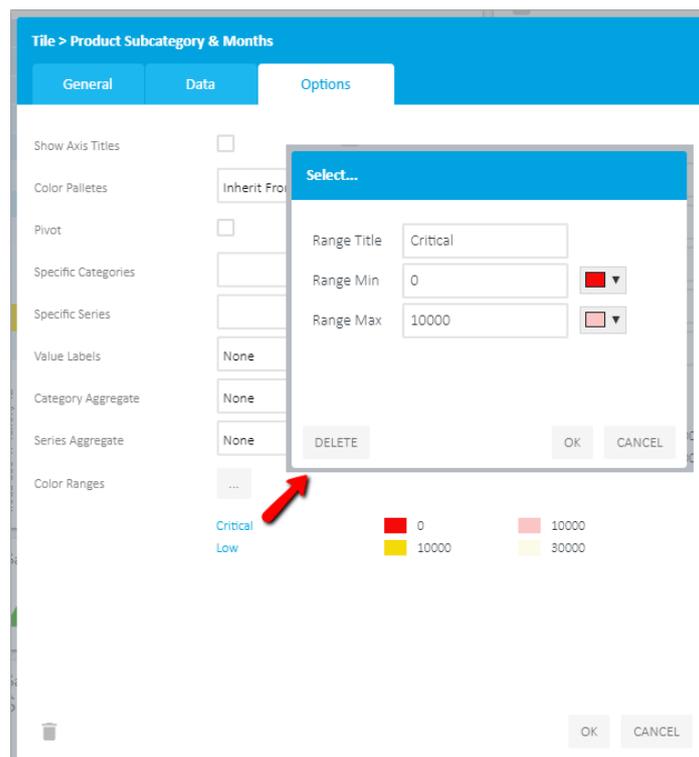
Treemap chart could be configured to display size of items based on the first series of values while displaying color based on the second series of values from the data chart is based upon. If the data is based upon OLAP/Analytic Model data, at any time click on the particular item to use analytic actions,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

4.9. 'HeatMap' chart

HeatMap chart displays values as colors for each item in the data set, presenting impact of each item compared to other items. HeatMap visualization beside default value-color range, supports additional ranges with custom colors, providing beautiful and quick visual analytic insights to rendered data.



Default color range is defined by the default color pallet on the dashboard/chart. Additional value-color ranges are defined in visual options on the HeatMap chart. HeatMap chart could contain many value-color ranges. Manually added value-color ranges have rendering priority compared to default value-color range.



4.10. 'Cluster Stack Column' chart

'Cluster Stack Column' chart is available only for a SQL query results rendering. Within each category item cluster name should be specified that will be used to separate column in clusters. A SQL query should be constructed on such way that category item (the first column in the SQL query results), contains cluster name and category item name separated by the hashtag (**cluster#item**).

Example of SQL query with defined cluster groups ...

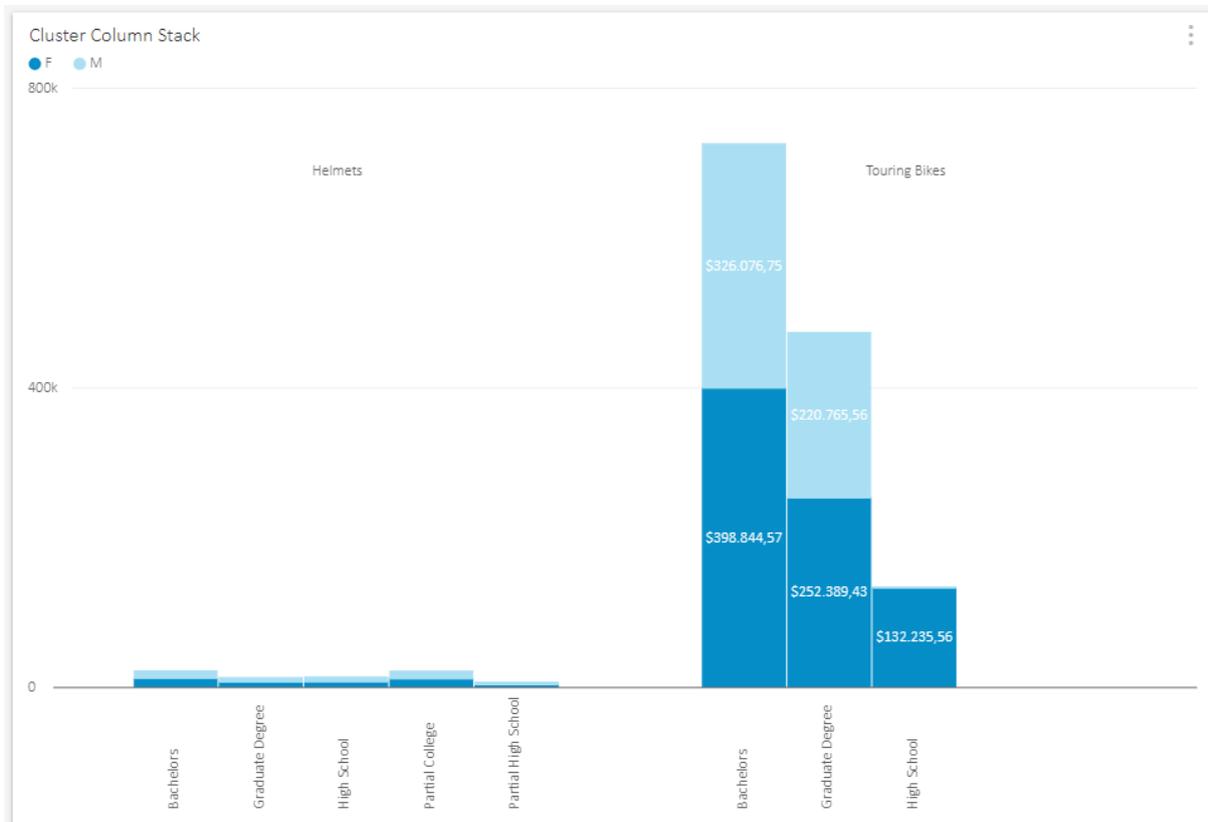
Query

```
declare @color nvarchar(50)=null
select top 15 dimproductsubcategory.EnglishProductSubcategoryName + '#' + EnglishEducation as [some], Gender,
sum(salesamount) as sales, sum(salesamount) as sales1
from factinternetsales
left join dimproduct on factinternetsales.productKey = dimproduct.productKey
left join dimproductsubcategory on dimproductsubcategory.productsSubcategoryKey = dimproduct.productsSubcategoryKey
left join DimProductCategory on DimProductCategory.ProductCategoryKey = DimProductSubcategory.ProductCategoryKey
left join DimCustomer on DimCustomer.CustomerKey = FactInternetSales.CustomerKey
where color = 'blue'
group by dimproductsubcategory.EnglishProductSubcategoryName, EnglishEducation, Gender
order by EnglishProductSubcategoryName, EnglishEducation, Gender
```

Results

Category some	Values Gender	Values sales [\$#,###]	Values sales1 [Format Values]
Helmets#Bachelors	F	\$11.196,8	11196,8000
Helmets#Bachelors	M	\$10.182,09	10182,0900
Helmets#Graduate Degree	F	\$6.508,14	6508,1400
Helmets#Graduate Degree	M	\$5.843,33	5843,3300
Helmets#High School	F	\$6.753,07	6753,0700
Helmets#High School	M	\$6.613,11	6613,1100

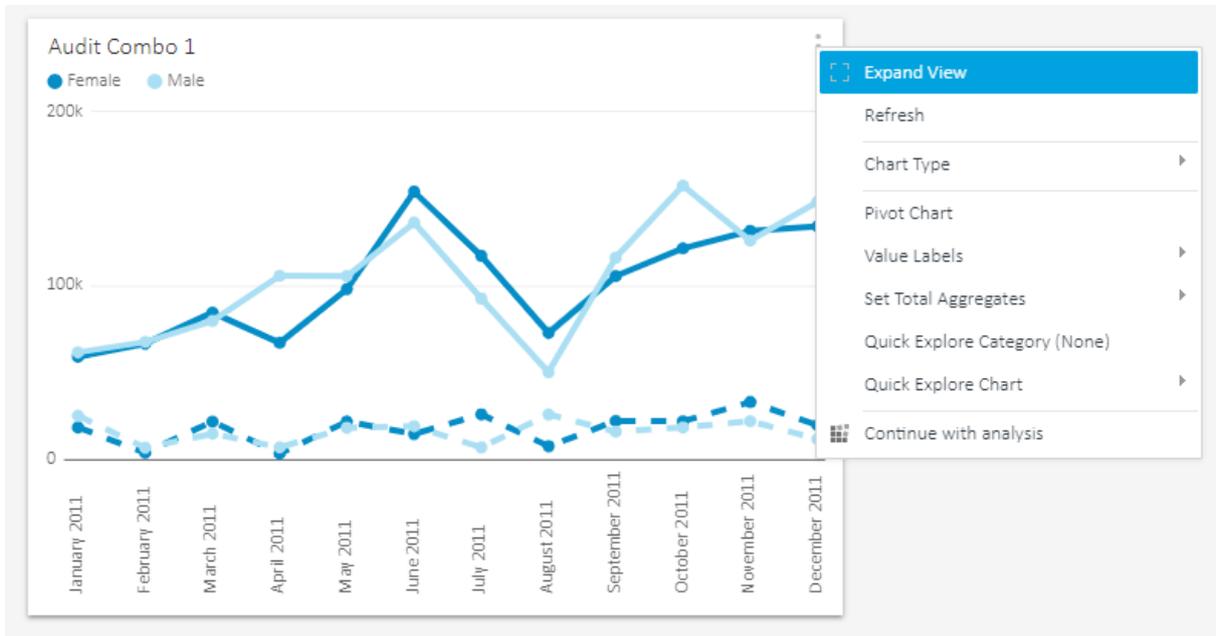
Rendered 'Cluster Stack Column' chart ...



4.11. 'Expand View' of the dashboard chart

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

All tiles have 'Magnify' icon that enlarges chart visualization.



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



Enlarged view also includes analytic actions (if data is from OLAP/Analytic Model data source), export to Excel/PDF file and option to continue the analysis in the full analysis view.

4.12. 'MDX query' data for dashboard tiles

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

Query
Permissions

Data
Impersonate
Caching

Define query to return required data.

Query Name:

Query type: Analytic data (Categories, series) ▼

Data Source: AdventureWorks2014(OLAP) ▼

Query

```
select {[Measures].[Internet Sales Amount], [Measures].[Internet Tax Amount]} on 0,
{[Product].[Product Categories].children} on 1
from
[Adventure Works]
```

Results

Category	Series Values	Series Values
Product Categories	Internet Sales Amount	Internet Tax Amount
Accessories	\$700.759,96	\$56.060,80
Bikes	\$28.318.144,65	\$2.265.451,62
Clothing	\$339.772,61	\$27.181,81
Components	-	-

Series

Categories

Example of 'Column chart' using above query data...



4.13. 'SQL Queries' data for dashboard tiles

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

Query
Permissions

Data
Impersonate
Caching

Define query to return required data.

Query Name:

Query type:

Data Source:

Query

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

Categories

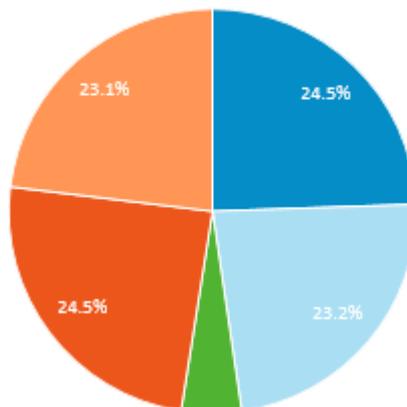
Series

Results

Category	Series Values	Series Values
englishproductname	salesamount [\$#,##0]	totalproductcost [\$#,##0]
Road-150 Red, 62	\$3,578,27	\$2,171,29
Mountain-100 Silver, 44	\$3,399,99	\$1,912,15
Mountain-100 Silver, 44	\$3,399,99	\$1,912,15
Road-650 Black, 62	\$699,10	\$413,15
Mountain-100 Silver, 44	\$3,399,99	\$1,912,15
Road-150 Red, 44	\$3,578,27	\$2,171,29
Road-150 Red, 62	\$3,578,27	\$2,171,29

Example of 'Pie chart' using above query data...

- Road-150 Red, 62
- Mountain-100 Silve
- Road-650 Black, 62
- Road-150 Red, 44
- Mountain-100 Black



5. Dashboard layout configuration options

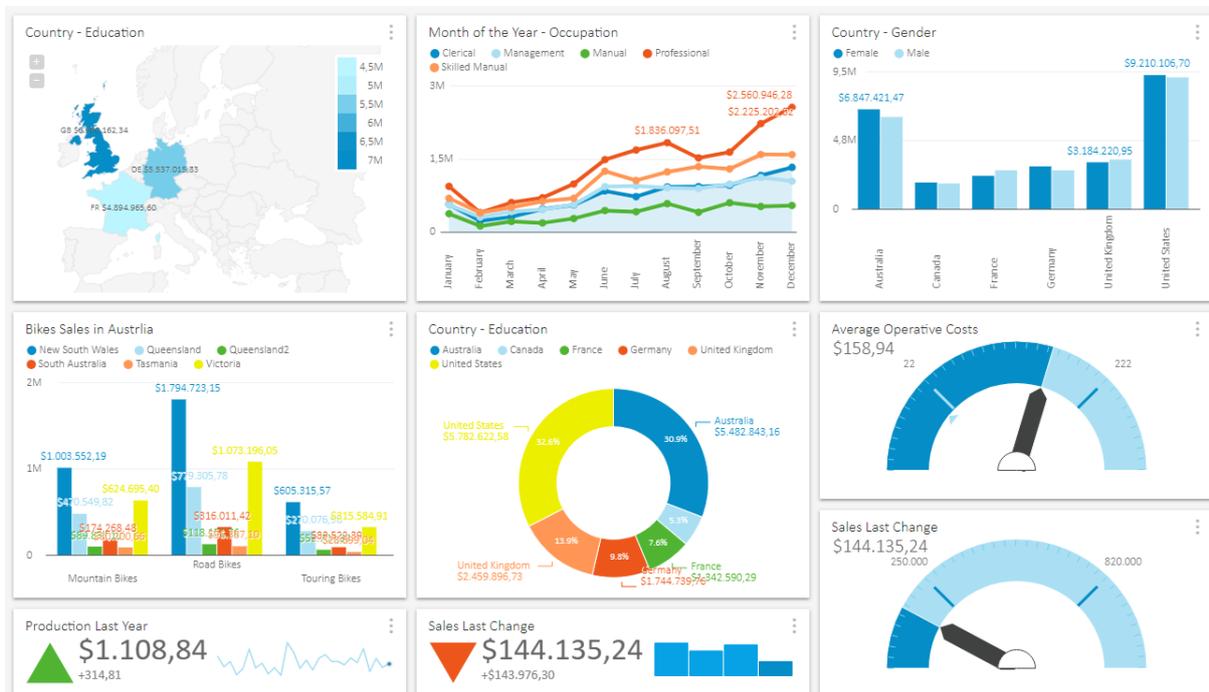
Dashboard and rendered visualizations could be additionally configured to display additional visual and data options. Each dashboard tile has visualization options that are easy to configure to maximize the perception of related data.

5.1. Color theme pallet

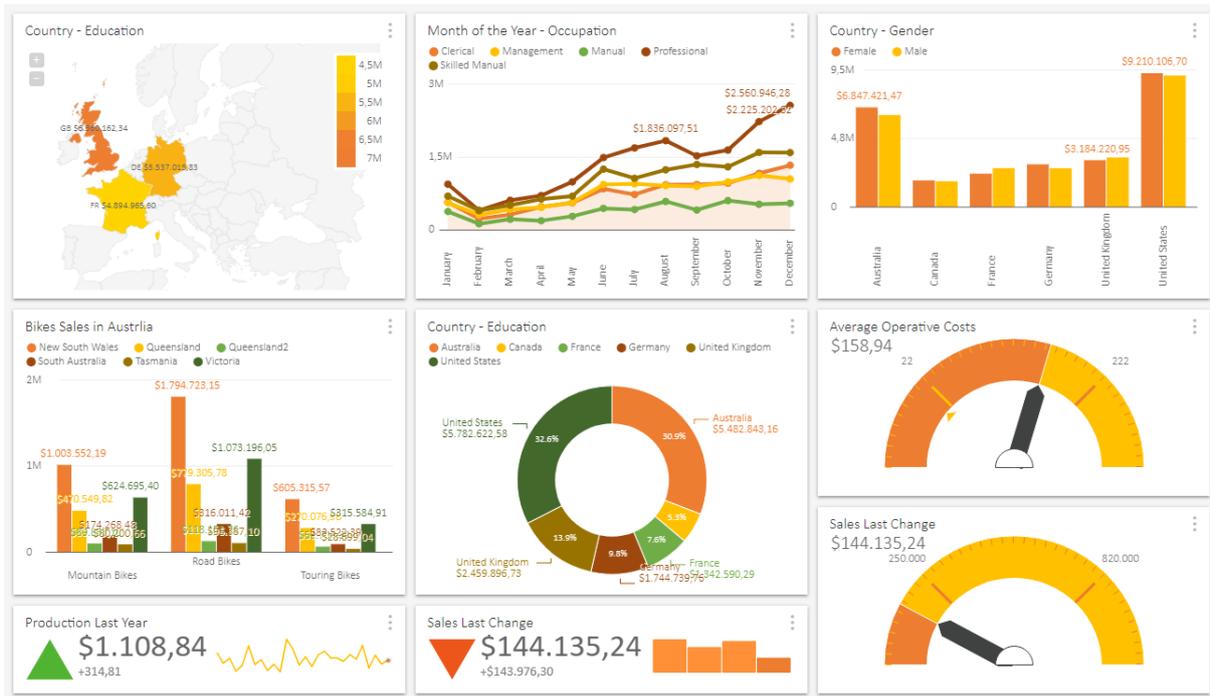
Set the dashboard color theme pallet that will be applied to all dashboard tiles or set color pallet for particular tile visualization. By default, all dashboard tiles inherit the color theme from the dashboard (General Settings) which is by default 'Standard' color theme. While in the dashboard 'Design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

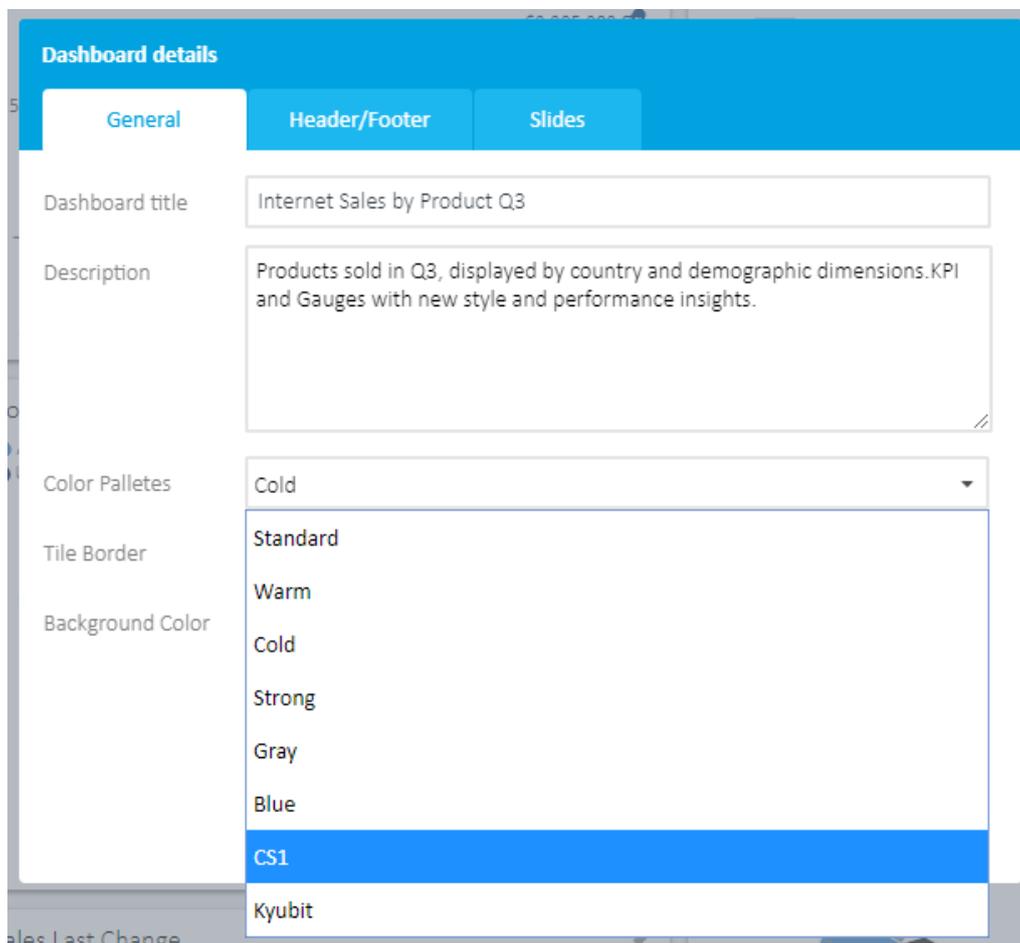
With some manual workaround, it is possible to add your own color palette that will be available for selection in the dashboard design view. To add your color set, follow these steps.

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

```

$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 #ADCEA #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\Javascrpts\collorPallets.js file and also save it to some other backup place, that will be used to restore the same file after upgrade to the new version of Kyubit Business Intelligence.
- 4) The custom color palette is available for the selection for the Dashboard color theme or particular Tile color theme.

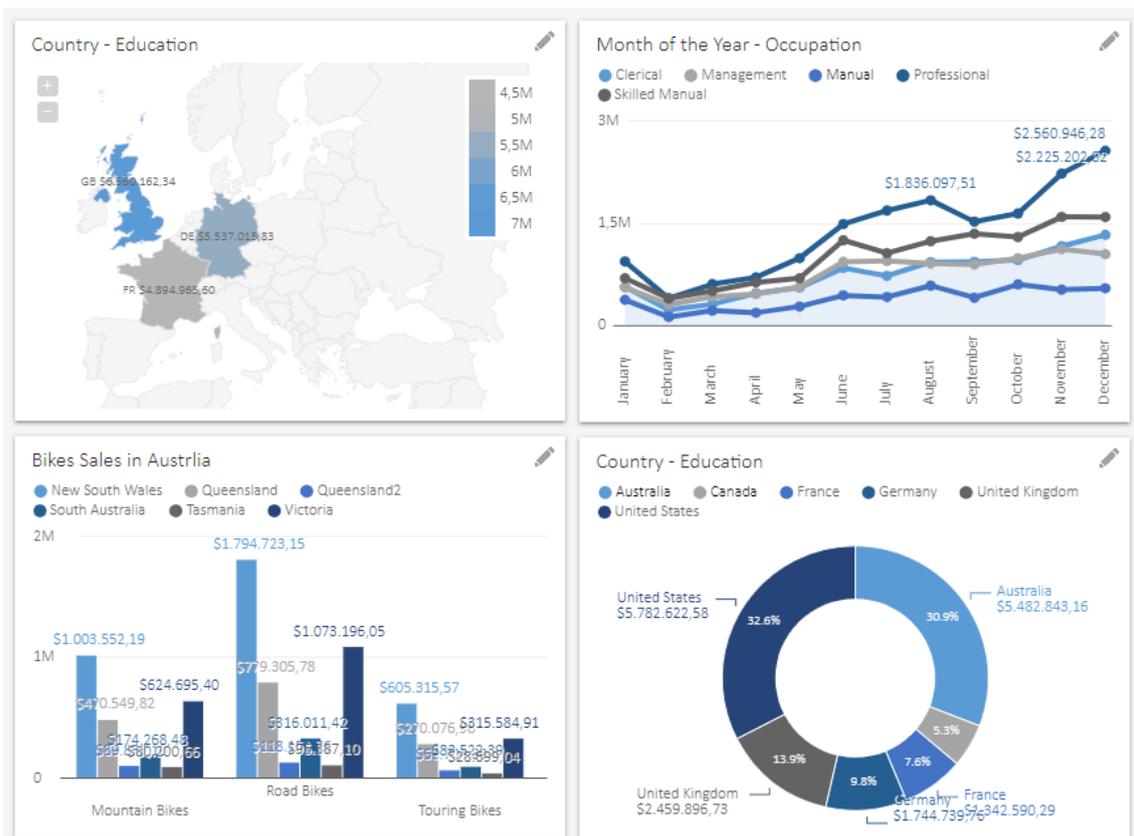
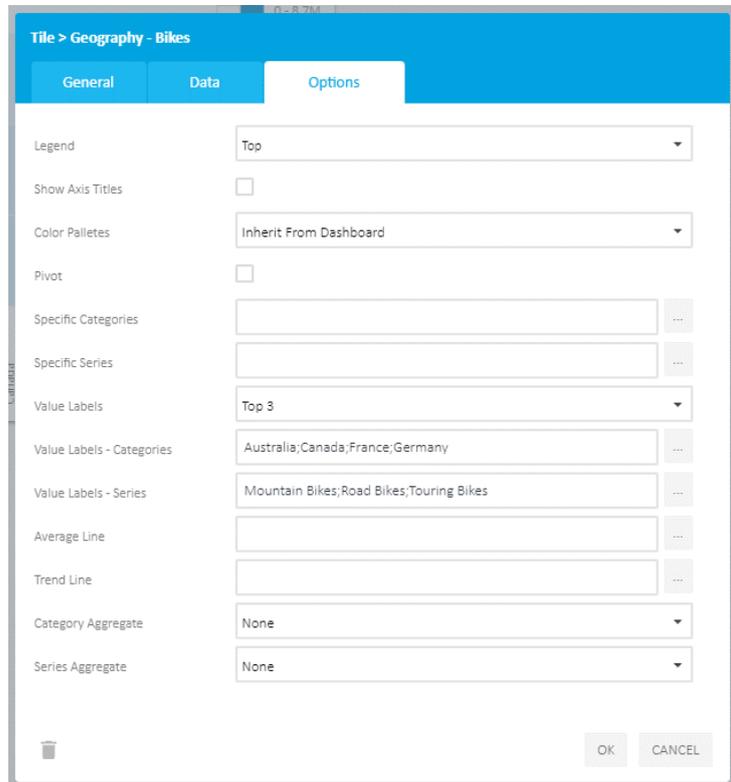


5.3. Value labels

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

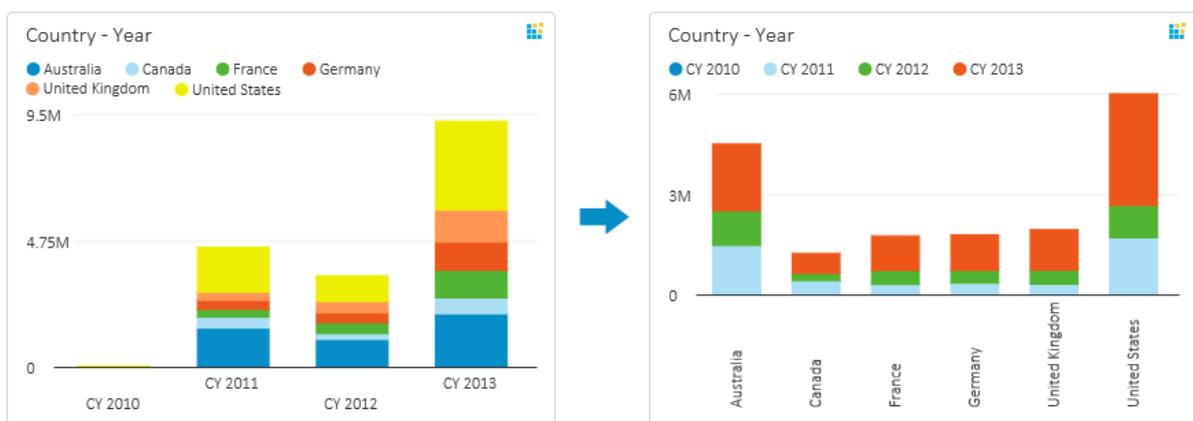
- 1) Select 'Dashboard design mode' -> 'Tile edit' -> 'Options'
- 2) Choose 'All' to set 'Value Labels' for all values on the chart.
- 3) Choose 'Specific Categories' to select categories that will be displayed
- 4) Choose 'Specific Series' to select categories that will be displayed



5.5 Pivot Categories/Series

With one click on the tile 'Options' switch position of categories and series and turn around the impression of the data on the chart visualization. A useful feature when returned data from OLAP and SQL sources require different axis orientation of rows and columns we would like to use on the chart.

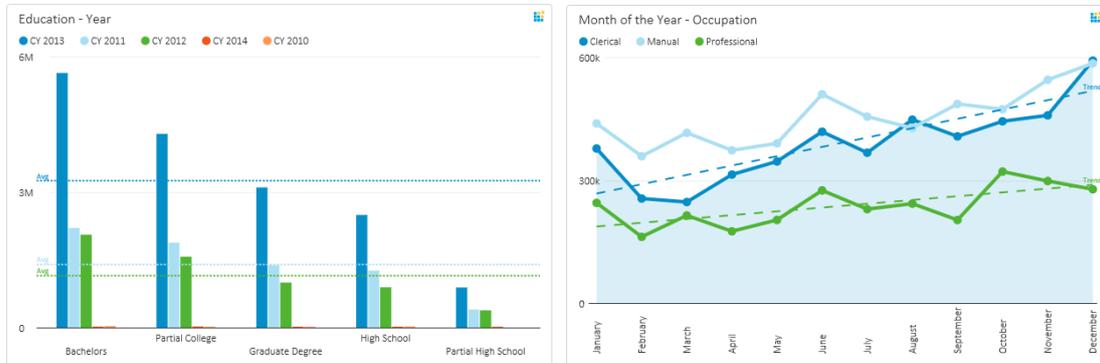
- 1) Select 'Dashboard design mode' -> 'Tile edit' -> 'Options'
- 2) Mark 'Pivot' checkbox, categories and series will switch positions



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 the Linear Trend equation.

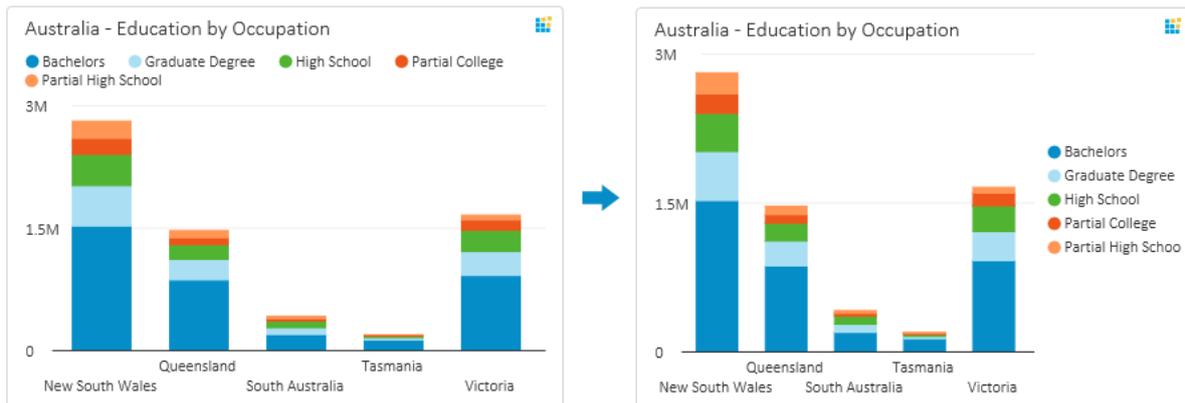
- 1) Select 'Dashboard design mode' -> 'Tile edit' -> 'Options'
- 2) Select 'Series Trend Line' or 'Series Average Line' pickers to select series for which you would like to display the Trend or Average line.



5.7. Legend display and the position

Customize the 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.

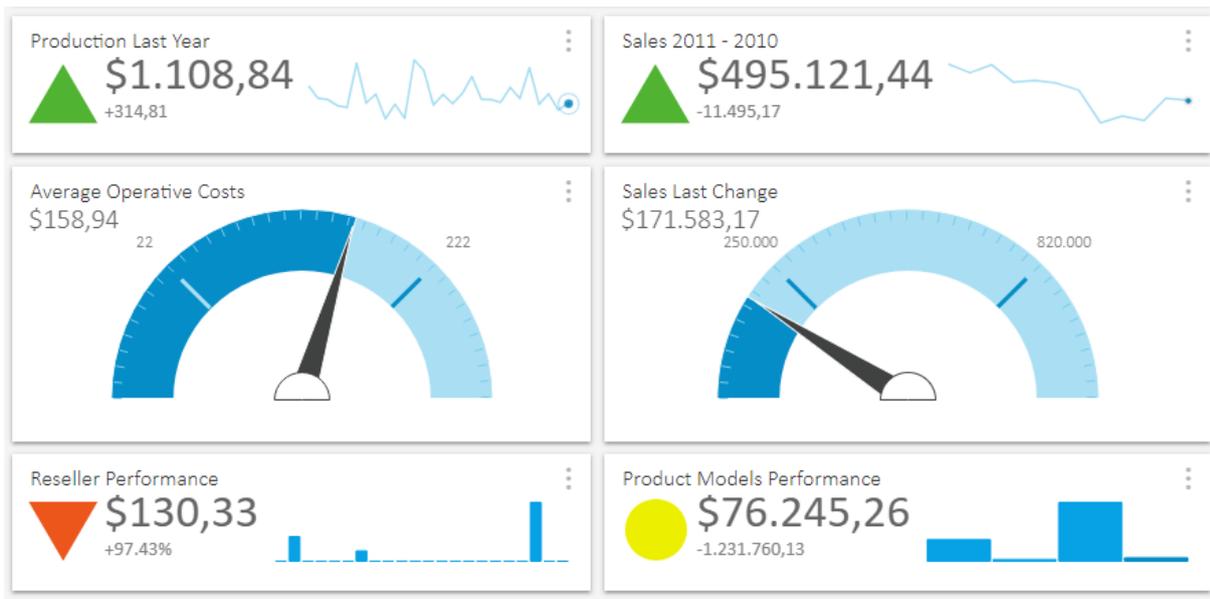


5.8. Dashboard tile borders

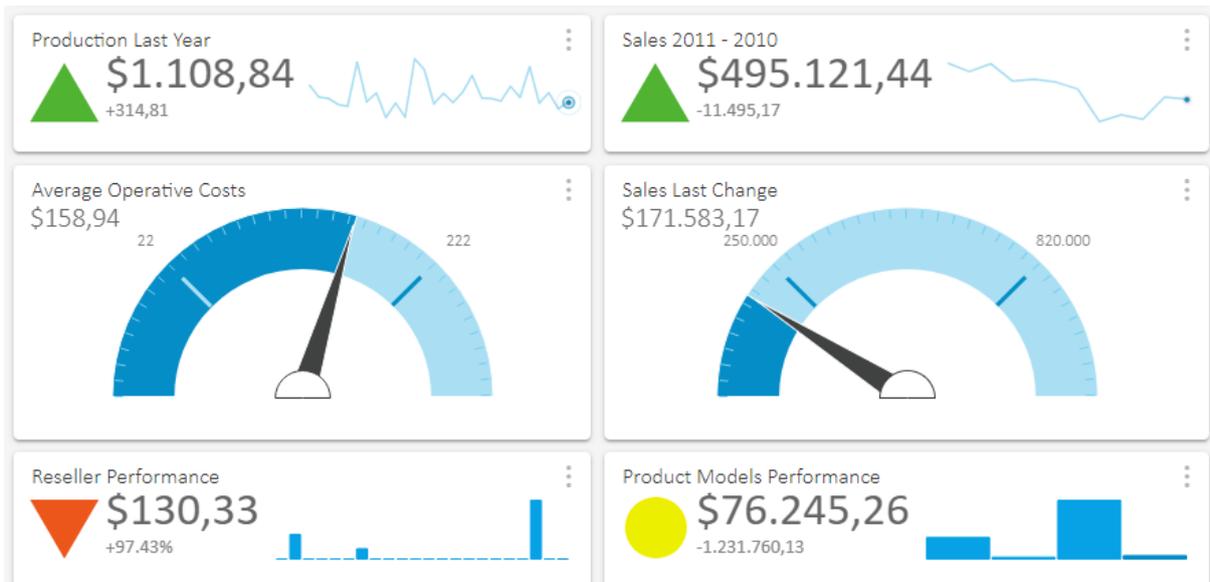
The dashboard tile border is displayed with **Shadow Square** edges by default. In 'Design View' dashboard 'Details' -> 'General' settings tile border could be set to **Shadow Square**, **Square**, **Round** or **None** borders.

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

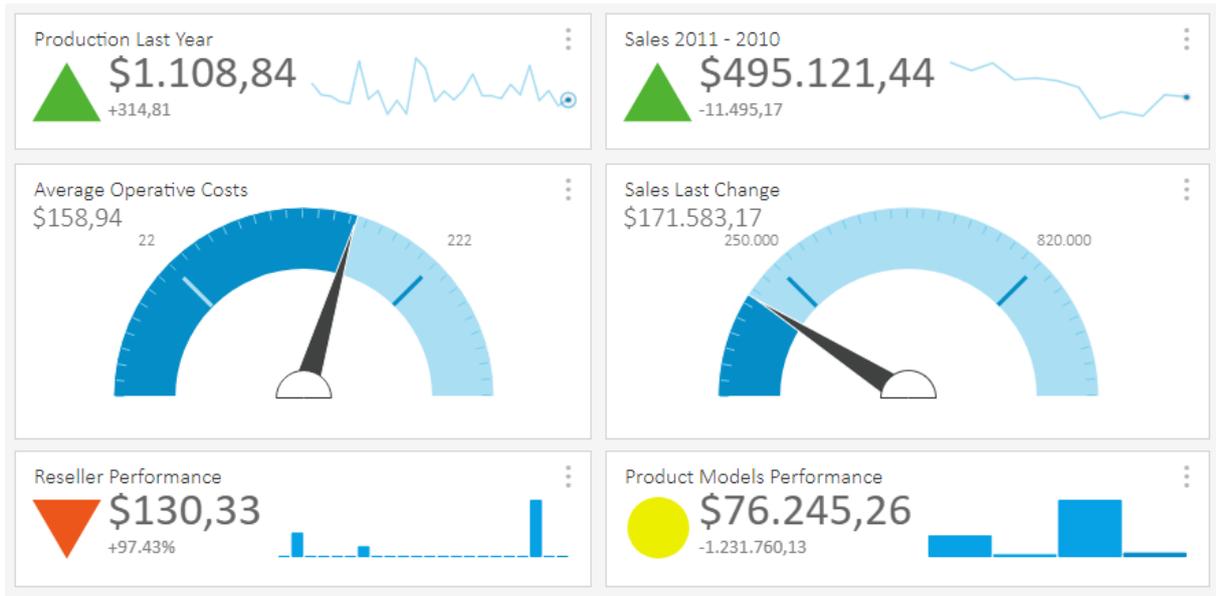
Shadow Square ...



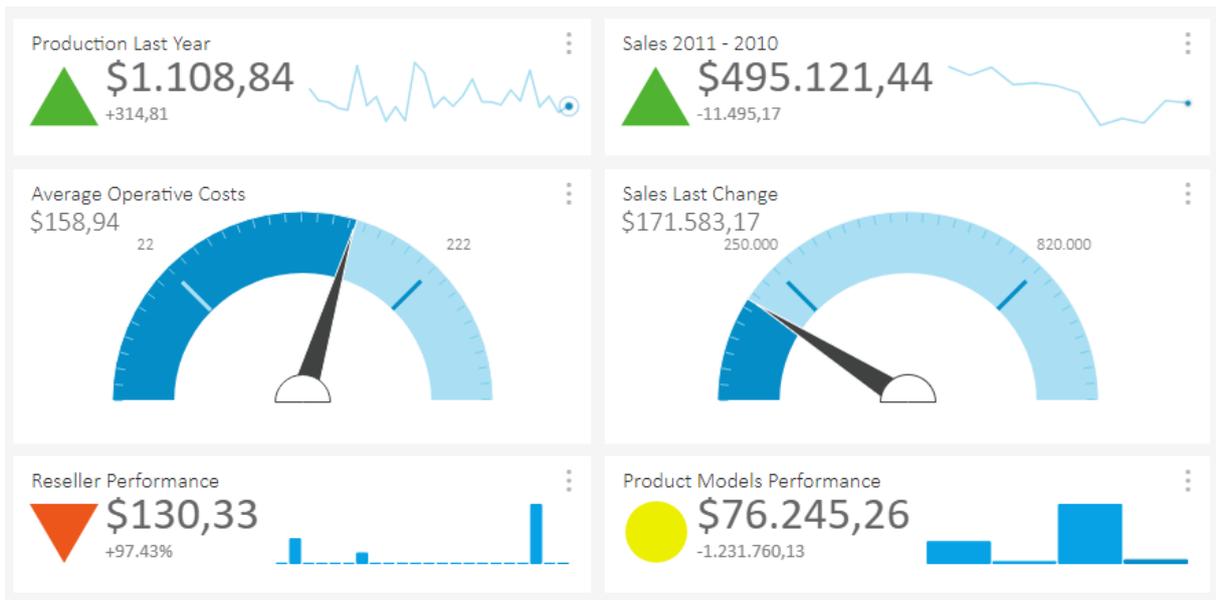
Shadow Round ...



Square (border) ...



None (border) ...



6. Working with KPIs

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

The screenshot displays the Kyubit Business Intelligence application interface. On the left is a navigation sidebar with the following menu items: Home, Analyses, Dashboards, Data Sources, Queries, and KPI & Scorecards. Under 'KPI & Scorecards', there are sub-items: 'KPIs > All available' (highlighted), 'KPIs > Created by me', 'Scorecards > All available', and 'Scorecards > Created by me'. The main content area is titled 'KPIs > All available' and features a 'NEW KPI' button, a copy icon, and a trash icon. Below this is a search bar labeled 'Title'. A list of KPIs is shown, each with a checkbox and a line graph icon: 'Sales Overall', 'Average Operative Costs', 'Production Last Year', 'Product Models Performance', 'Reseller Performance', 'Sales Last Change', 'Sales by month', 'Sales by Month', and 'Last Months - Bikes sales'.

When one of the dashboard tiles should display KPI, one must first be defined in the Kyubit Business Intelligence application to be used on the 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 describe KPI meaning for other users.
- **'Success Model'**, defines if higher values are more successful (**Higher is better**), lower values are more successful (**lower is better**) or values closer to target are more successful (**Middle-Range Success**).
- **'KPI Value'** is actual value that is tested for KPI success. Could be configured as 'Fixed numeric value' or value from a '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 a '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 a '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.

Testing KPI definition ...

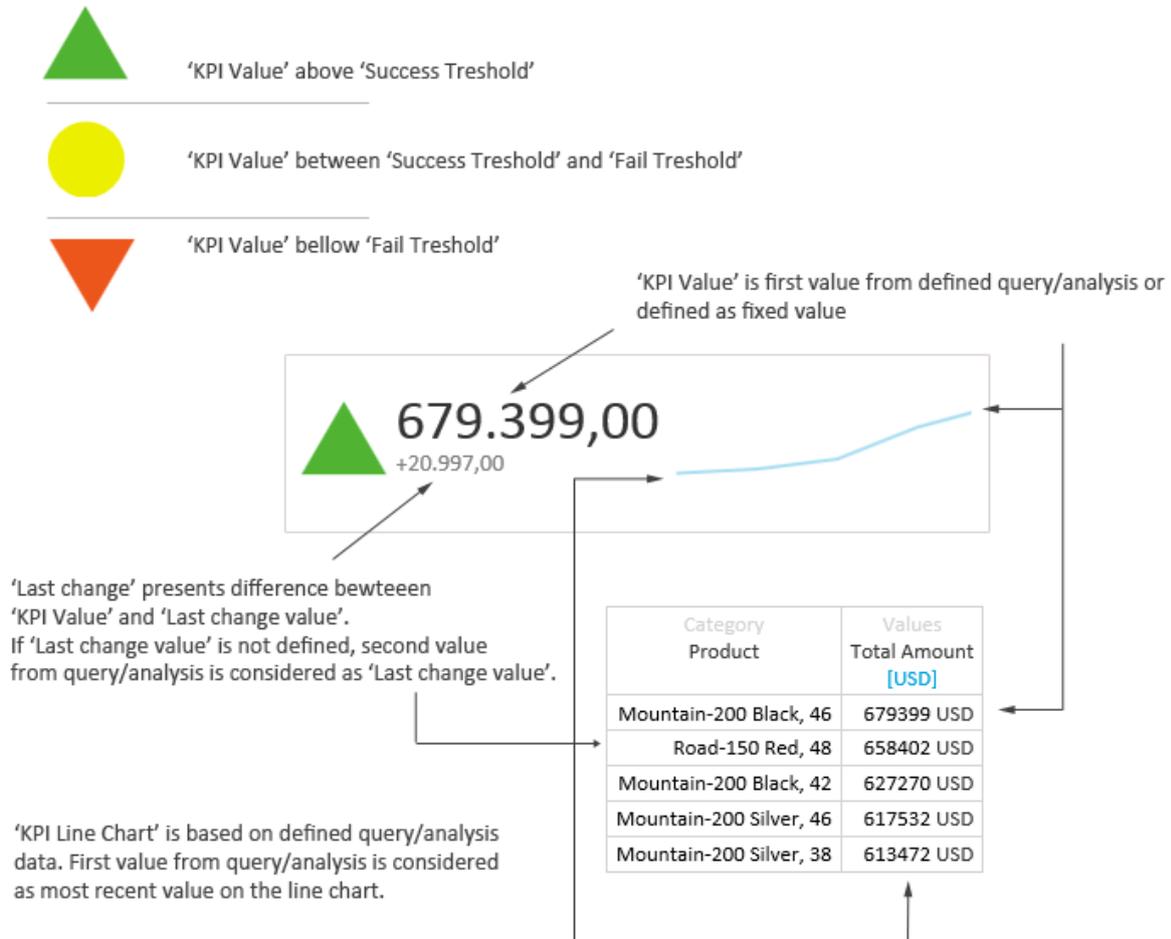
The screenshot displays the 'KPI Design' interface, specifically the 'Test' tab. The interface includes a blue header with 'KPI Design' and a 'Permissions' icon. Below the header are three tabs: 'General', 'Definition', and 'Test'. The 'Test' tab is active, showing configuration options for a KPI card:

- 'Show last change' is set to 'Bottom' via a dropdown menu.
- 'Last change as percentage' is an unchecked checkbox.
- 'Mini Chart' is set to 'Line Chart' via a dropdown menu.

The main area shows a preview of the KPI card. The card displays a green upward-pointing triangle, the value '\$1.108,84', and a change of '+314,81'. To the right of the card is a 'TEST KPI' button. At the bottom of the interface, there are buttons for 'KPI DESIGN TIPS', 'SAVE', 'DELETE', and 'CLOSE'. A small watermark 'AdaptivaWorks2014' is visible at the bottom right of the interface.

6.2. Understanding data usage for KPI design

The 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 first value in the first series of values retrieved from analysis or query. All other values after the first value are considered as a historic supplement of values and are used to describe trend and last value change (delta).



KPI value is the first value in the first series of query values, other values are used to draw line chart and the second 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 or Kyubit users and groups to have 'Read' or 'Read/Write' permissions or set unrestricted access to created KPI. (See chapter 7.1. for more details)

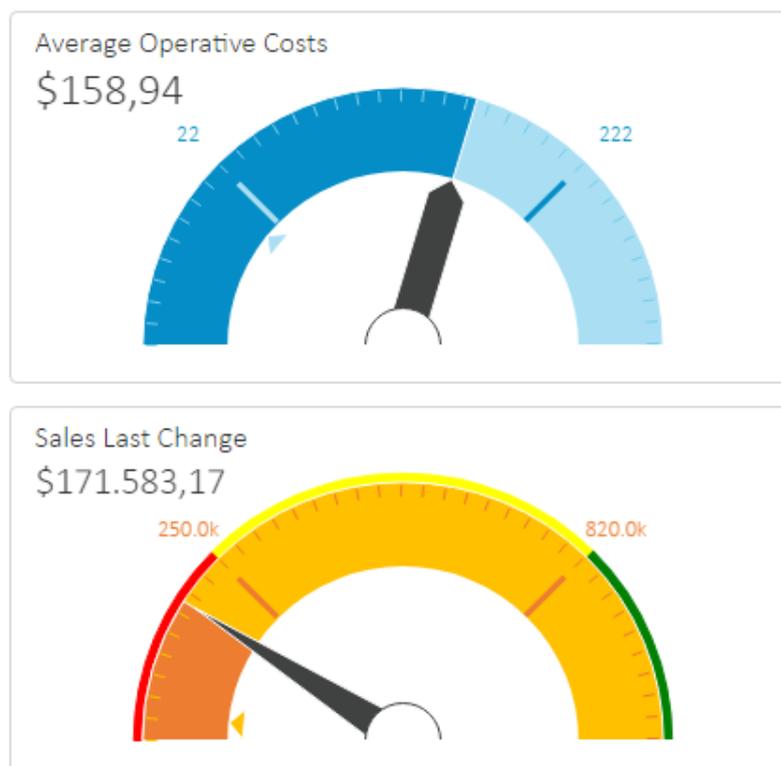
6.4. KPI visualization

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.



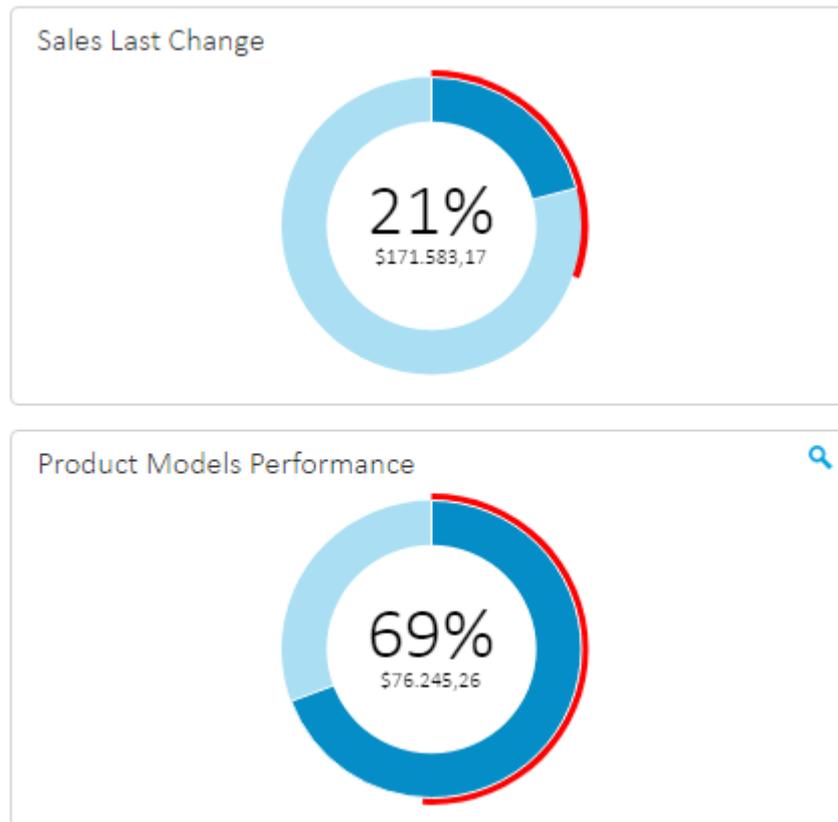
6.5. Gauge KPI visualization

Gauge visualization displays KPI current status with additional insight on how much it takes to meet success or fail threshold that is indicated by the pointer on the gauge. Various visualization 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 the 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 the 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.

Kyubit Business Intelligence Scorecards > All available

NEW SCORECARD

Title	KPIs
Current Performance Just a few weeks ago, the U.S. stock market was calmly climbing toward record highs. Now, stocks are quite rocky amid mounting concerns over next week's Brexit vote in the U.K. and frustration with global central banks.	6
Q4 Performance List Following a huge rally on Monday, when stocks across the continent gained more than 3% the markets are a little more subdued on the week's second trading day.	3
Scorecard 3753	4
Audit's SC01 Lorem ipsum dolor sit amet, sed te viris dicam, erat exerci voluptatum duo no. No minimum's sensibus usu. Exerci & antiopam convenire vis ex, his putent tamquam quaerendum ei. Liber ludus veniam no est.	6
Audit SC02	7

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

Scorecard Permissions

General Definition

Set Scorecard KPI elements.

All available KPIs

- KPI decimal below 1
- KPI decimal below 1 (2)
- KPI Jet
- Last Months - Bikes sales
- Middle Range 1
- Product Models Performance
- Production Last Year
- Reseller Performance
- Sales 2011 - 2010
- Sales by month
- Sales by Month
- Sales Last Change
- Sales Overall

Scorecard

- Average Operative Costs
- Production Last Year
- Sales Overall

REFRESH

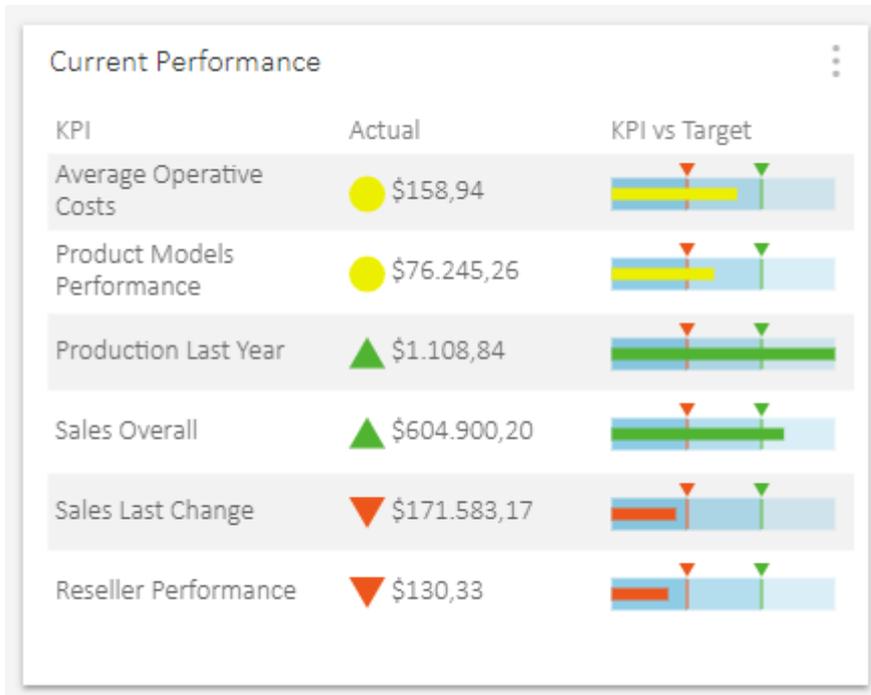
SELECT/DESELECT ALL

UP DOWN

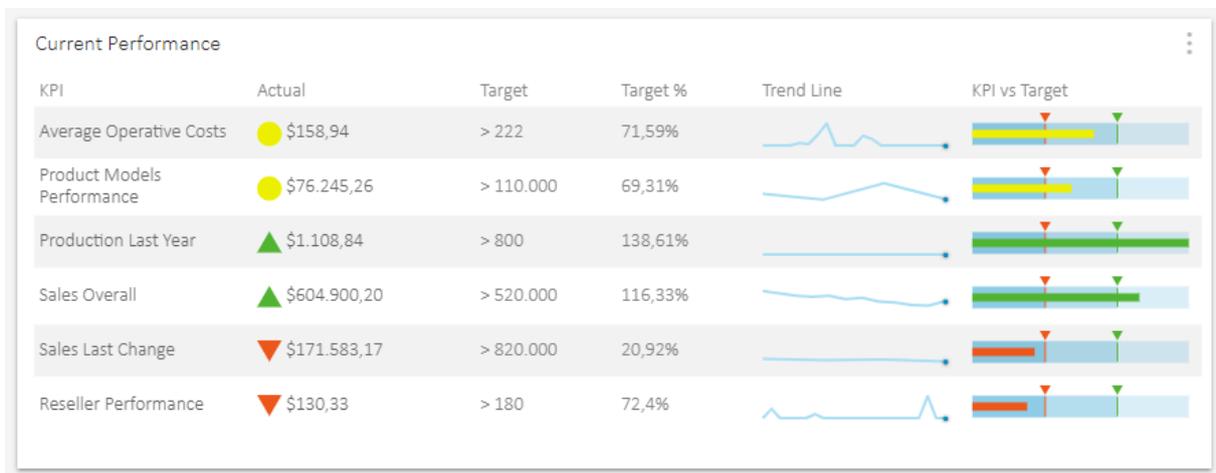
SAVE DELETE CLOSE

The appearance of the Scorecard on the dashboard depends on the dashboard column width and/or defined columns of Scorecard to display. If there is the place, more details about Scorecard KPIs will be displayed (if not configured manually).

Scorecard with less space on the dashboard:



Scorecard with more space on the dashboard:

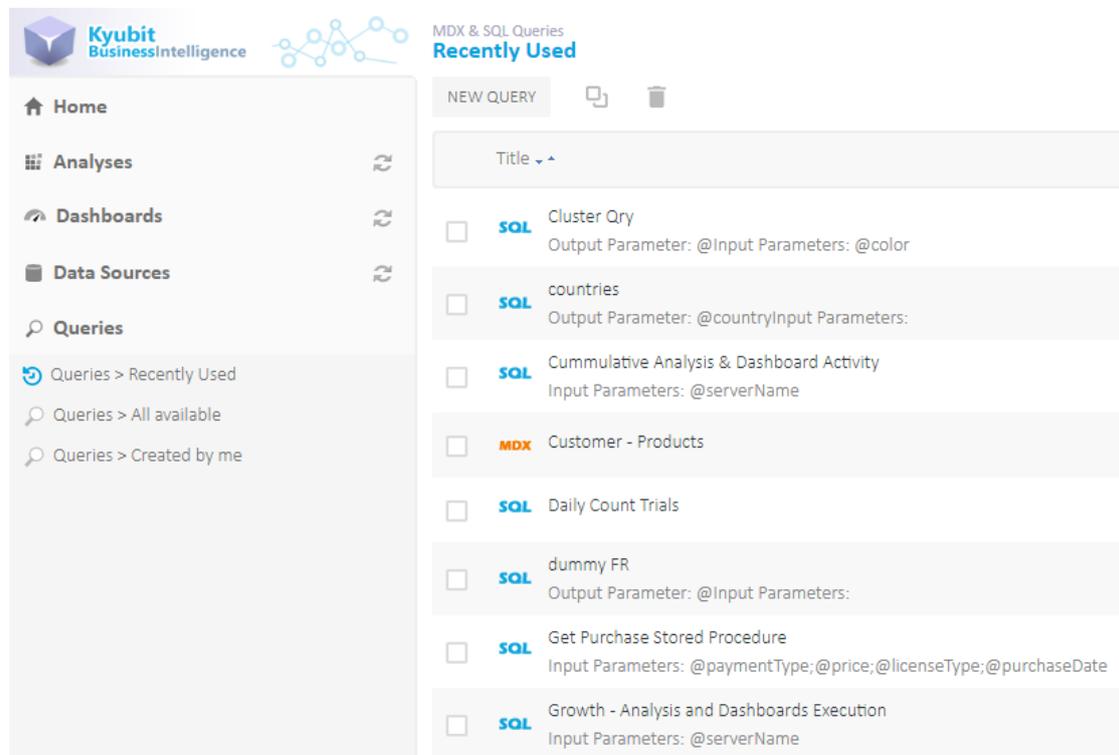


If KPI has **'Short Name'** defined, it will be used to display KPI name on the Scorecard. If not, KPI default name will be used.

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 the 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 a Query

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

'Query Type' has two options:

- a) **Data Table.** This form of the query consists of Categories and Series. The first column defines Categories, while other columns present Series and must contain numeric values. This form of the query is used to present/visualize data on the dashboard.
- b) **Filter Values.** This form of the 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.
- c) **Any data.** This form of the query consists of Categories and Series. The first column defines Categories, while other columns present Series with any values (does not have to be numeric).

Query

Query Name: Products 2013

Query type: Data Table (Category, Values)

Data Source: AdventureWorksDW(SQL)

```

select top 20 dimproduct.EnglishProductName, FactInternetSales.SalesAmount
from FactInternetSales
left join dimproduct on DimProduct.ProductKey = FactInternetSales.ProductKey
where FactInternetSales.Freight > 10
and DueDate > '2013-02-01' and DueDate < '2014-02-01'
and EnglishProductName not like '%road%' and EnglishProductName not like '%mountain%'

```

Results

Category	Values
EnglishProductName	SalesAmount [\$#,###0]
Touring-2000 Blue, 60	\$1,214,850
Touring-2000 Blue, 60	\$1,214,850
Touring-1000 Yellow, 50	\$2,384,070
Touring-1000 Blue, 60	\$2,384,070
Touring-1000 Blue, 54	\$2,384,070
Touring-2000 Blue, 54	\$1,214,850

RUN QUERY

First column contains ID

SAVE DELETE CLOSE

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

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

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

8.2. Formatting query values

For each column of the query data results, “Format string” definition could be defined to present the data with an appropriate formatting to the end-users.

```
select top 20 dimproduct.EnglishProductName, FactInternetSales.SalesAmount, FactInternetSales.ExtendedAmount
from FactInternetSales
left join dimproduct on DimProduct.ProductKey = FactInternetSales.ProductKey
where FactInternetSales.Freight > 10
and DueDate > '2013-02-01' and DueDate < '2014-02-01'
and EnglishProductName not like '%road%' and EnglishProductName not like '%mountain%'
```

Category EnglishProductName	Values SalesAmount [\$#,#.##0]	Values ExtendedAmount [€#,#.##]
Touring-2000 Blue, 60	\$1.214,850	€1.214,85
Touring-2000 Blue, 60	\$1.214,850	€1.214,85
Touring-1000 Yellow, 50	\$2.384,070	€2.384,07
Touring-1000 Blue, 60	\$2.384,070	€2.384,07
Touring-1000 Blue, 54	\$2.384,070	€2.384,07
Touring-2000 Blue, 54	\$1.214,850	€1.214,85

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

Set number format definition for column 'ExtendedAmount'

Format Values

Example:
123456.789

\$#,#.##	=> \$123.456,78	<input type="button" value="APPLY"/>
€#,#.##	=> €123.456,78	<input type="button" value="APPLY"/>
#,# Units	=> 123456,78 Units	<input type="button" value="APPLY"/>
#,#.#	=> 123.456,7	<input type="button" value="APPLY"/>
#,#.###	=> 123.456,789	<input type="button" value="APPLY"/>
#,#.###0	=> 123.456,7890	<input type="button" value="APPLY"/>
#,#	=> 123.456	<input type="button" value="APPLY"/>

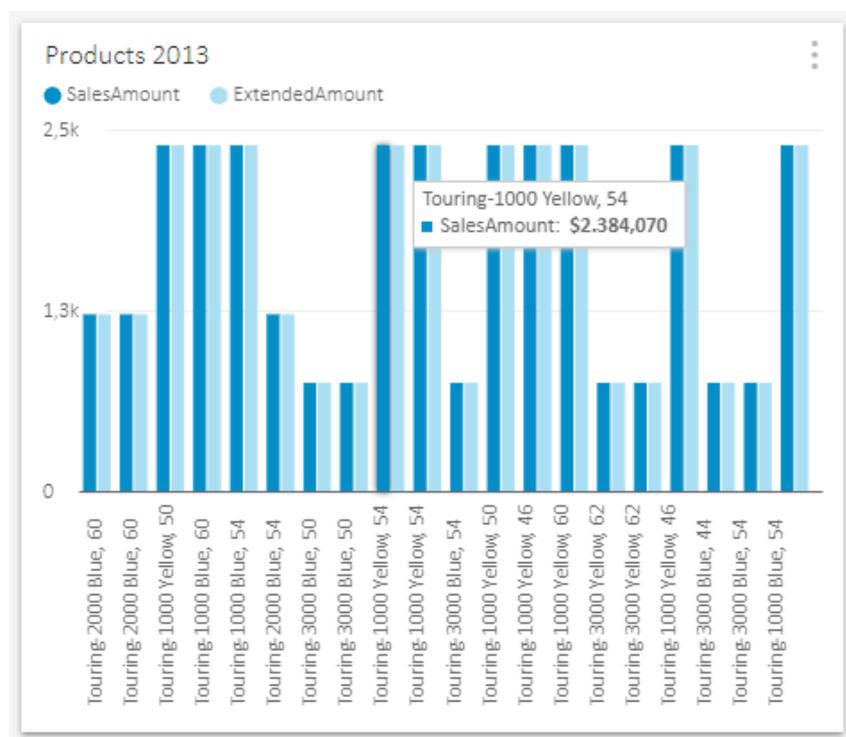
To get required number formatting output for data usage.

Category EnglishProductName	Values SalesAmount [\$#,###0]	Values ExtendedAmount [€#,###]
Touring-2000 Blue, 60	\$1.214,850	€1.214,85
Touring-2000 Blue, 60	\$1.214,850	€1.214,85
Touring-1000 Yellow, 50	\$2.384,070	€2.384,07
Touring-1000 Blue, 60	\$2.384,070	€2.384,07
Touring-1000 Blue, 54	\$2.384,070	€2.384,07
Touring-2000 Blue, 54	\$1.214,850	€1.214,85

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

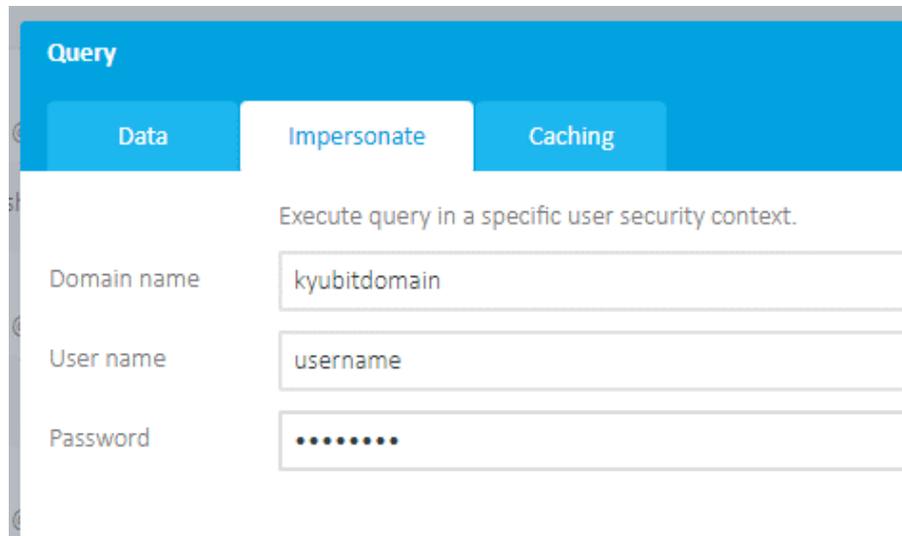
\$#,###	=>	\$123.456,78
€#,###	=>	€123.456,78
### USD	=>	123456,78 USD
#,##	=>	123.456,7
#,####	=>	123.456,789
#,####0	=>	123.456,7890
##	=>	123.456

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



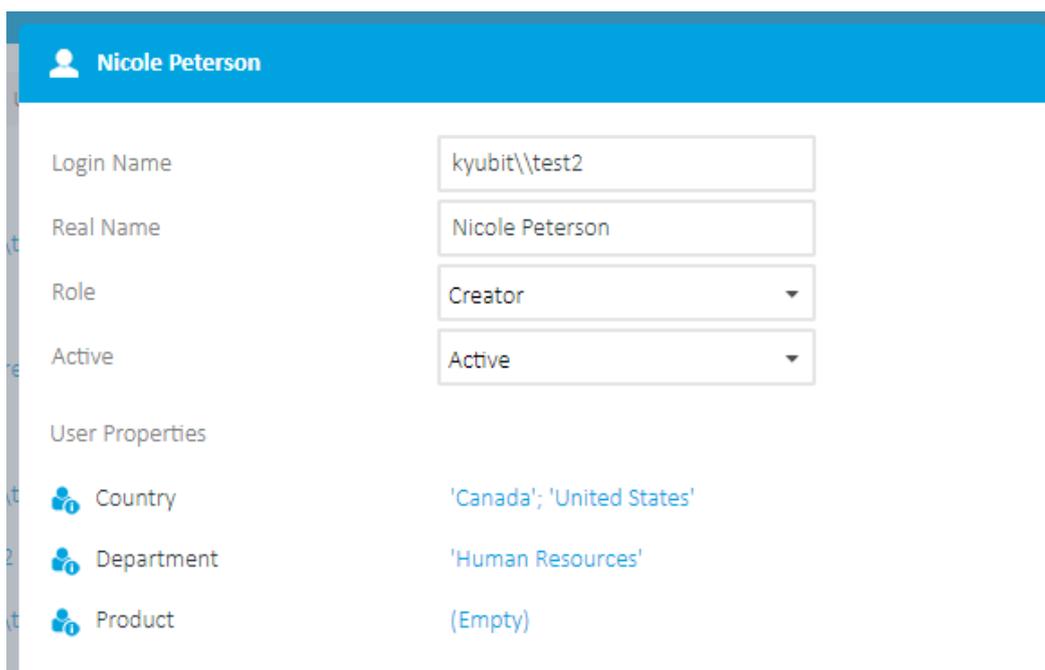
The screenshot shows the 'Query' design form with the 'Impersonate' tab selected. The form contains the following fields:

Field	Value
Domain name	kyubitdomain
User name	username
Password

8.4. 'User Properties' as query additional filters

The query could be filtered using current **user properties** to show the data of interest for the 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.



The screenshot shows the user profile for Nicole Peterson. The profile includes the following information:

Property	Value
Login Name	kyubit\\test2
Real Name	Nicole Peterson
Role	Creator
Active	Active
User Properties	
Country	'Canada'; 'United States'
Department	'Human Resources'
Product	(Empty)

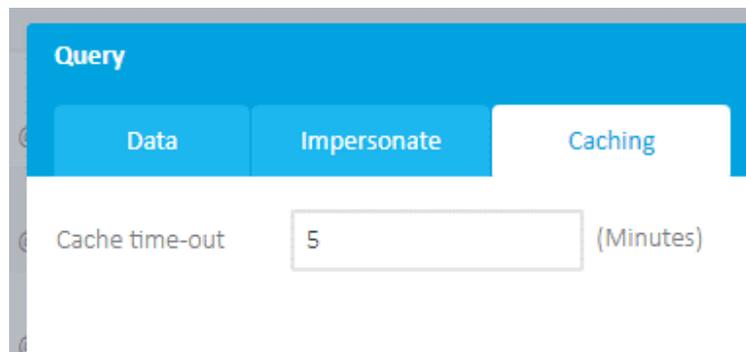
'User Properties' could be used to filter Analyses, Queries and Dashboards.

To add 'User Property' as query, add 'User Property' name with **double square brackets** to your SQL or MDX query. ([[UserPropertyName]])

Query Name	My Countries								
Query type	Any data								
Data Source	KyubitInternal(SQL)								
Query	<pre>select countryid, country from countries where country in ([[Country]])</pre>								
Results	<table border="1"> <thead> <tr> <th>Category</th> <th>Values</th> </tr> <tr> <th>countryid</th> <th>country</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Canada</td> </tr> <tr> <td>12</td> <td>Australia</td> </tr> </tbody> </table>	Category	Values	countryid	country	2	Canada	12	Australia
Category	Values								
countryid	country								
2	Canada								
12	Australia								

8.5. Query caching

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



The query results are cached on two levels. First, the 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, the query results are stored in the Kyubit Business Intelligence internal database. In both cases, cached query results will be expired after a defined amount of time and the original data source will be queried afterward.

8.6. Setting Query permissions

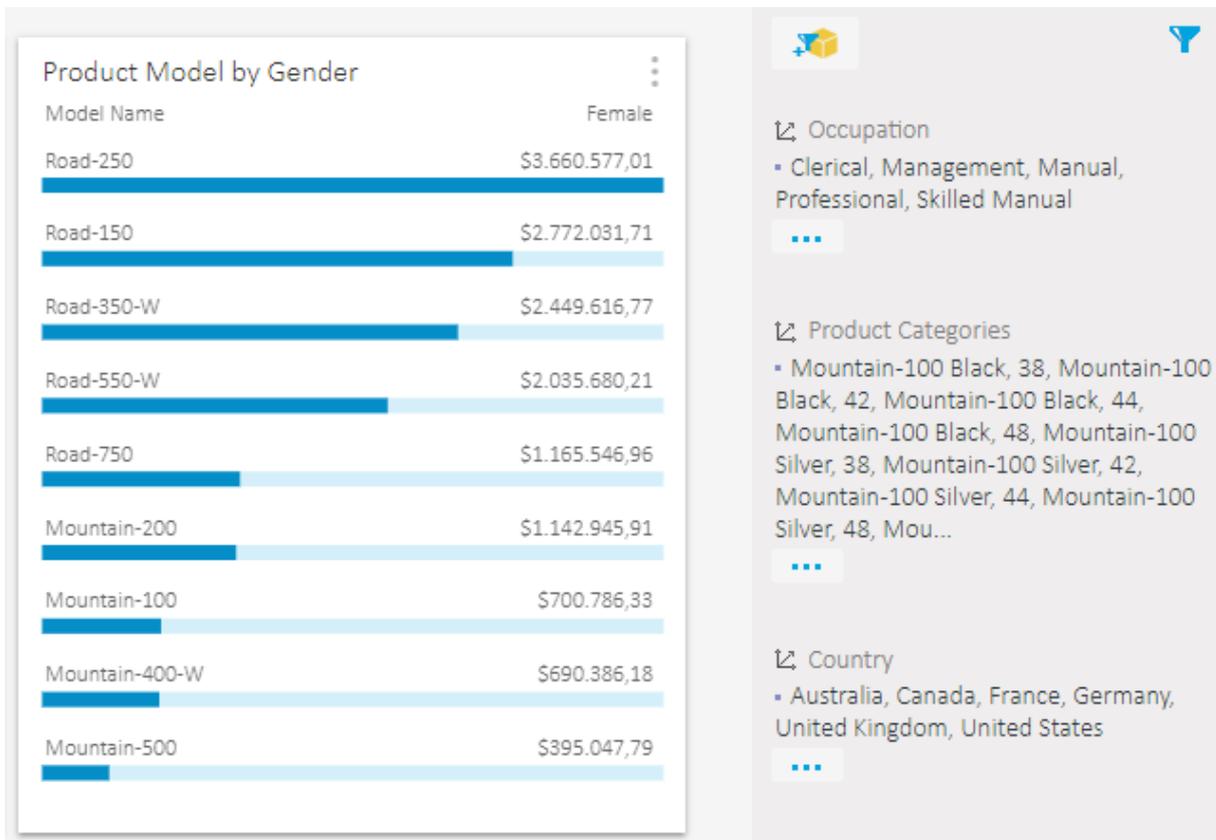
If the query object should be visible to other users, click on the 'Permissions' options in the upper-right corner and add appropriate Active Directory/Kyubit users and groups to have 'Read' or 'Read/Write' permissions or set unrestricted access to the created Query. (See chapter 7.1. for more details)

9. Dashboard Analytic Features

9.1. OLAP/Analytic Model Slicers

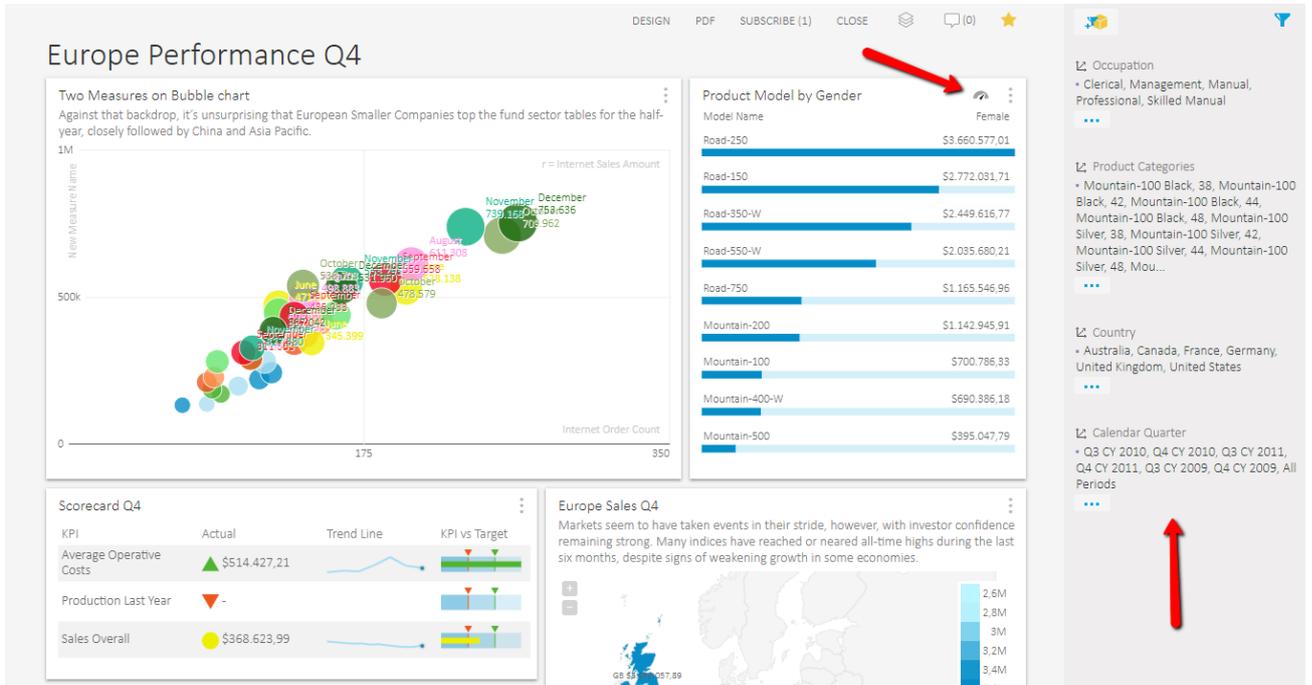
All data on dashboards that are based on the OLAP data source or Analytic Models could be manipulated with data slicers that could be added in the design or production time. If a slicer is added in the design time, it will be part of the dashboard whenever the dashboard is opened. Also, users who are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

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

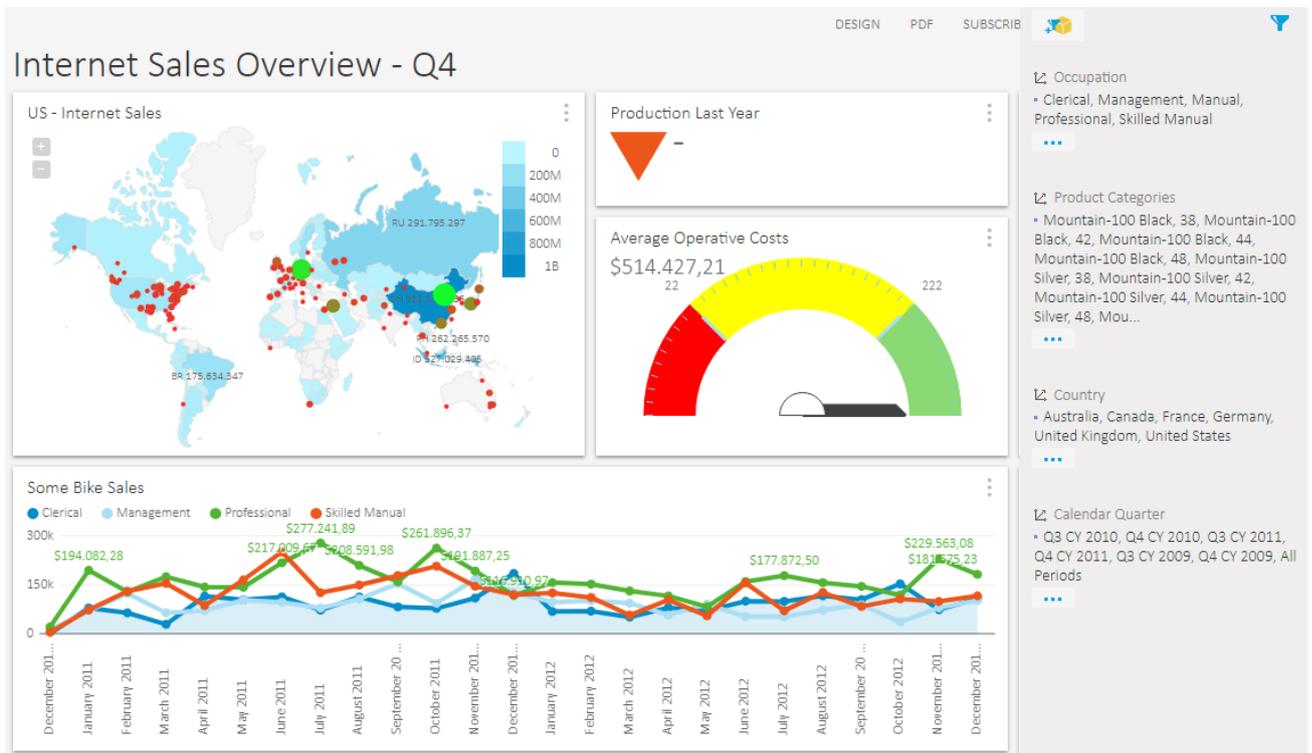


9.1.1. OLAP/Analytic Model filters inheritance to child dashboards

The dashboard could contain tiles that have 'Child dashboard' configured to open as a separate dashboard in the new browser tab. If the parent dashboard has filters defined, opening 'Child dashboard' will pass (inherit) all OLAP/Analytic Model filters from parent to child dashboard.



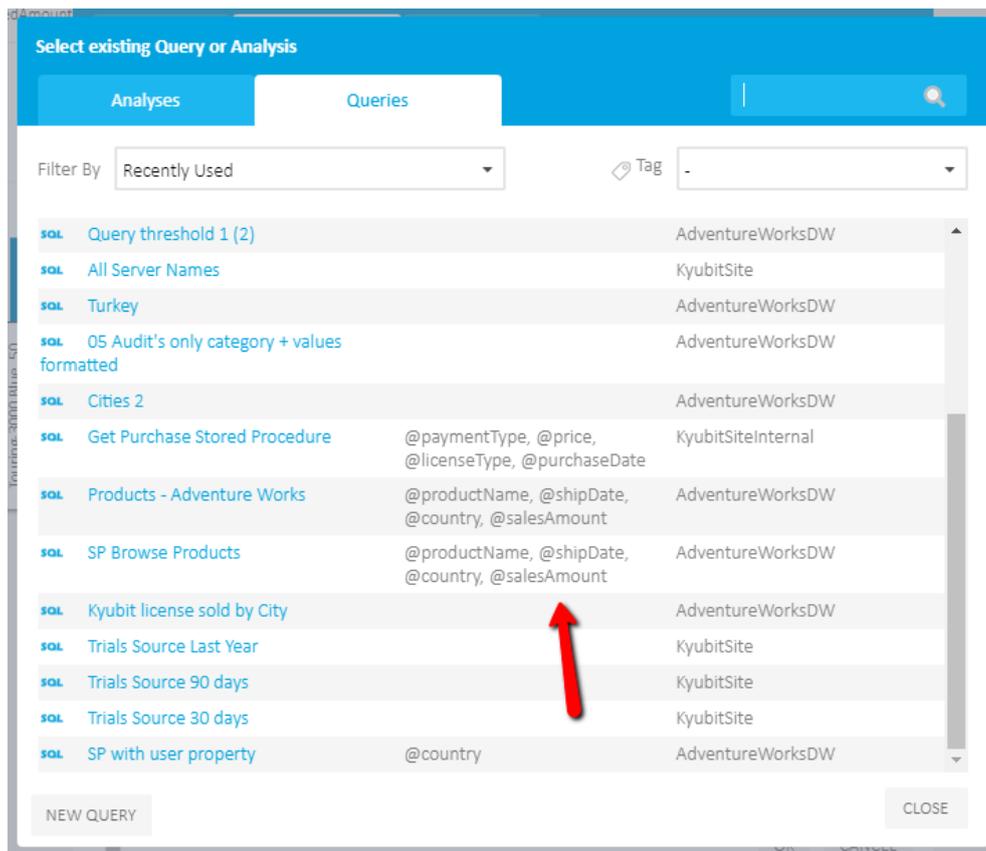
Child dashboard has gray OLAP filters that are inherited by opening from parent dashboard.



9.2. SQL data filtering

Data on the 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 create the dashboard chart that is based on the 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 a drop-down list of values that comes from SQL queries defined as 'Query Type' = 'Filter values'.

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



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

New Dashboard

Products 2013

@productName, @shipDate, @country, @salesAmount

Product Name	Region Name	Amount	Ship Date
AWC Logo Cap	Canada	8,9900	0,7192 04.02.2014
All-Purpose Bike Stand	Canada	159,0000	12,7200 04.02.2014
Fender Set - Mountain	Canada	21,9800	1,7584 04.02.2014
AWC Logo Cap	Canada	8,9900	0,7192 04.02.2014
Fender Set - Mountain	Canada	21,9800	1,7584 04.02.2014
Sport-100 Helmet, Red	Canada	34,9900	2,7992 04.02.2014
HL Mountain Tire	Canada	35,0000	2,8000 04.02.2014
Mountain Tire Tube	Canada	4,9900	0,3992 04.02.2014
AWC Logo Cap	Canada	8,9900	0,7192 04.02.2014

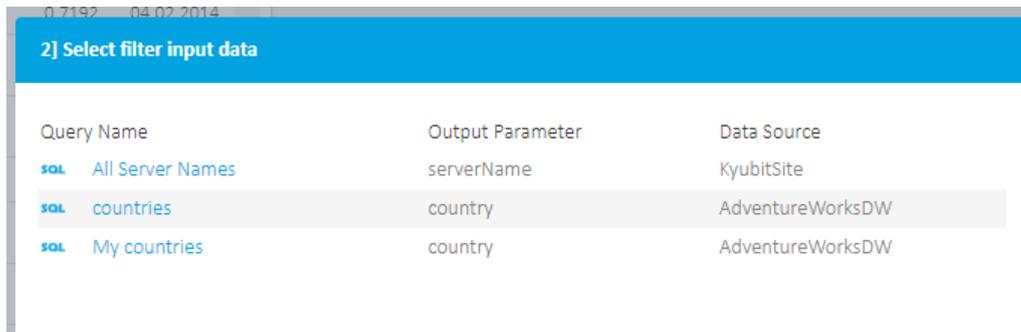
Adding a filter ...

1] Select type of filter value input

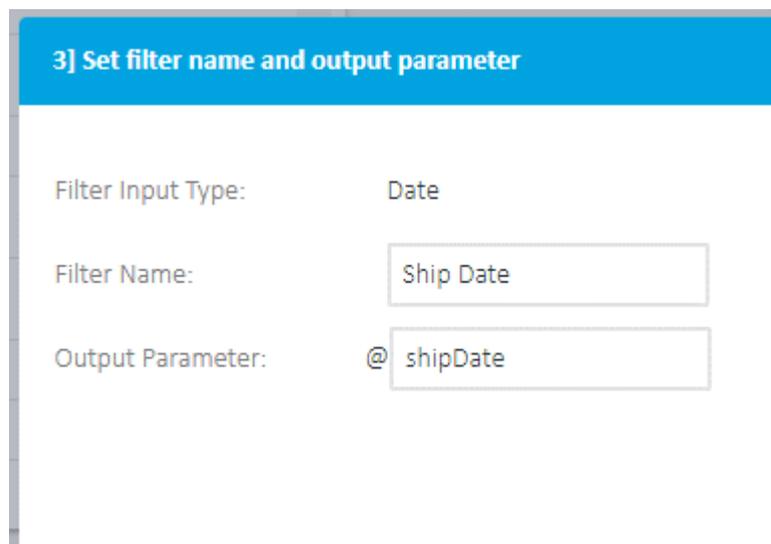
Text	<input type="text" value="aI"/>	SELECT
Number	<input type="text" value="1I"/>	SELECT
Date	<input type="text" value=""/>	SELECT
Dropdown	<input type="text" value="a"/>	SELECT
Multiselect	<input type="text" value=""/>	SELECT

CLOSE

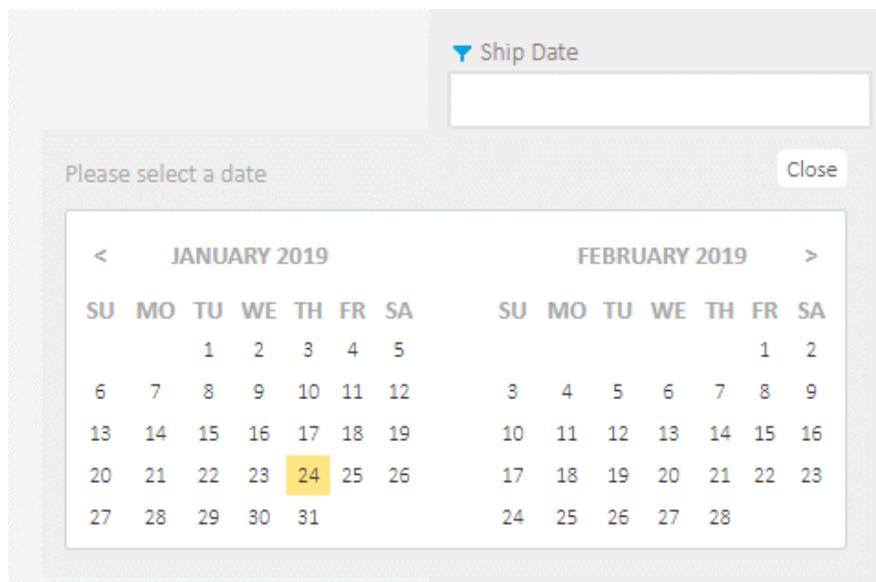
Adding a SQL filter will show a dialog to choose another query that return drop-down list of values that would be used to filter data or to select static input field that would be used for filtering. 'Number' or 'Date Time' filter type.



(Selecting query for a drop-down list of values for filtering. A 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 the 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 the 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 the 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) The declared variable must end with '=null' (like in the above sample)
- 2) In 'Where' clause, the referenced variable must be in brackets '@color' (like in the above sample)

We have added on the beginning of the query, declaration of the 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 guarantees that the query will be successfully executed if the 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 chart from the filtering

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

The screenshot shows the configuration interface for a dashboard tile titled "Bike Categories". The "Options" tab is selected, displaying a donut chart. The chart data is as follows:

Category	Percentage	Value
Touring Bikes	20.2%	\$11,997,505.77
Mountain Bikes	38.4%	\$22,831,365.45
Road Bikes	41.5%	\$24,697,134.16

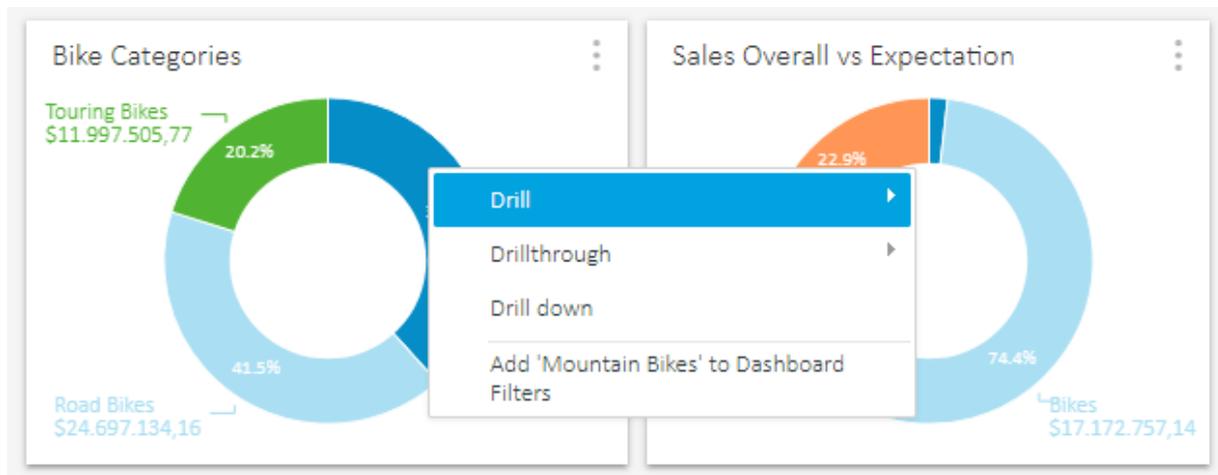
A red arrow points to the "FILTERING CONFIGURATION" button located below the chart.

The "Filtering Configuration" dialog box is shown with the following settings:

- Exclude from dashboard filtering
- Automatic
Tiles based on OLAP analysis automatically accept filters based on same data source. Query based tiles automatically accept filters when query input parameter is equal to filter output parameter.
- Explicit
Manually select which filters on the dashboard will be accepted by the tile.

9.4. Chart drill-down, drill-through actions on the dashboard

All dashboard tiles based on the **OLAP/Analytic Model** data source could be **drilled-down**, sliced or **drilled-through** in place within the dashboard. Right click on the **OLAP/Analytic Model** dashboard chart and selected one of the available analytic actions.



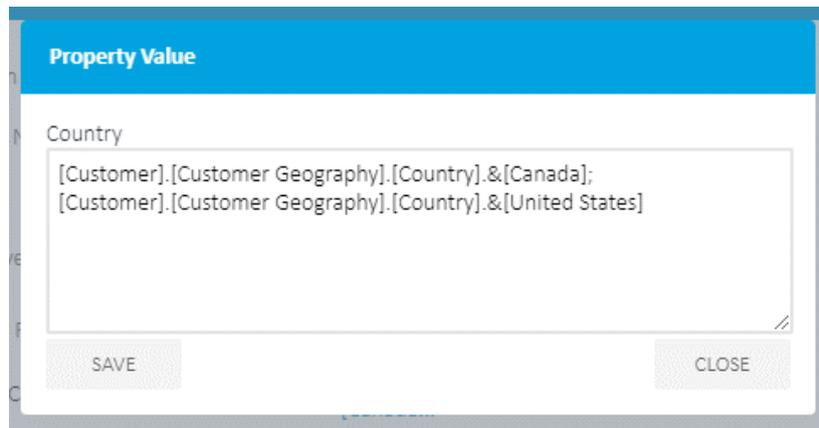
9.5 'User Properties' as Dashboard filters

The dashboard could be filtered using current user properties to show the data of interest for the 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.

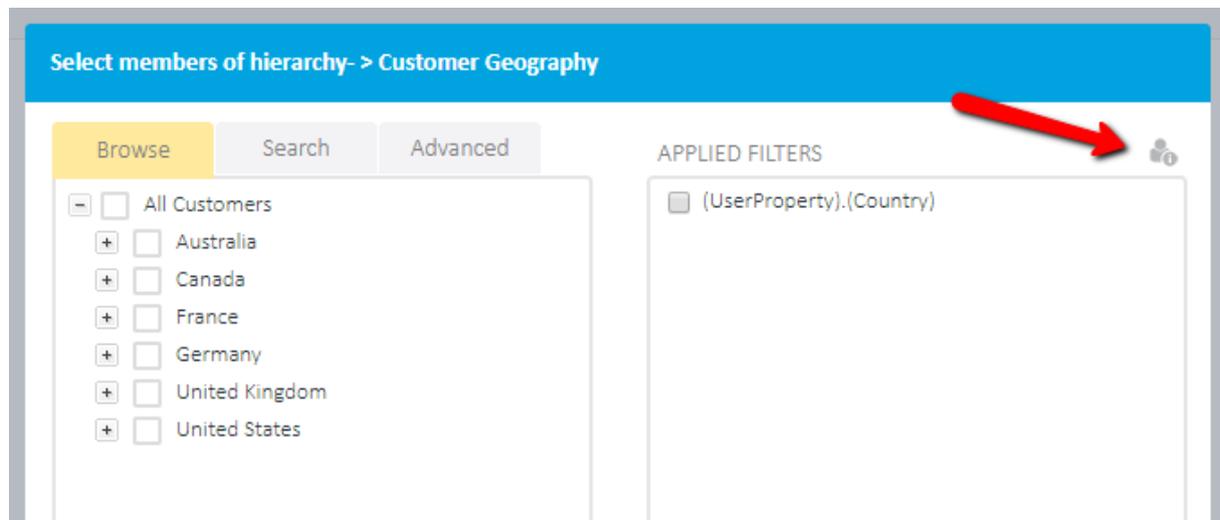
👤
Patrick Brown

Login Name	<input type="text" value="kyubit\test1"/>
Real Name	<input type="text" value="Patrick Brown"/>
Role	<input type="text" value="Creator"/>
Active	<input type="text" value="Active"/>
User Properties	
Country	[Customer].[Customer Geography].[Country].& [Canada...
Department	[Department].[Departments].[Department Level 01]
Product	(Empty)



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

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



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

9.5. Define dashboard filter values using URL query string

If the 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. In this example, we added the filter with title 'Customer Geography' which is identified with parameter ID = '[Customer].[Customer Geography]'. In order to supply the value for this filter using URL, we add the member unique name for the 'France' member -> [Customer].[Customer Geography].[Country].&[France] ...

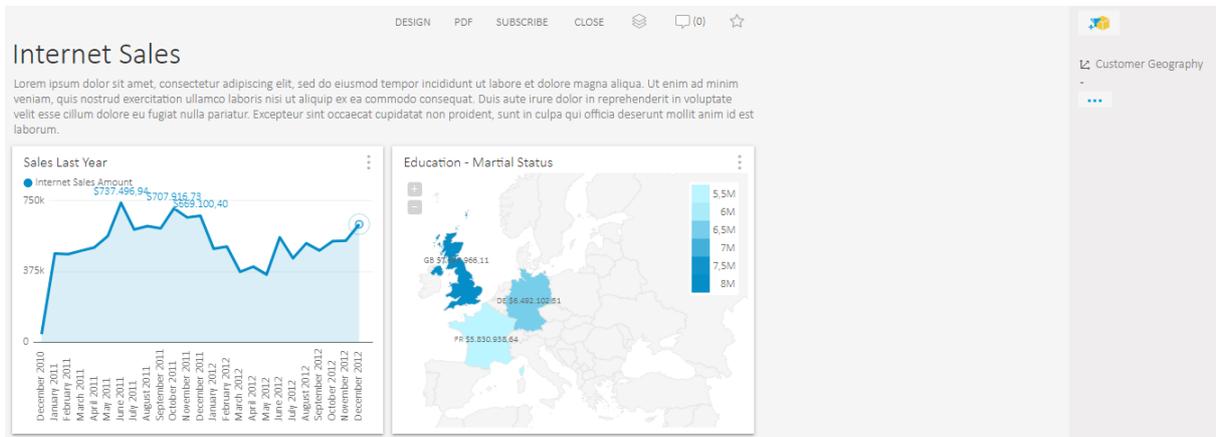
@[Customer].[Customer Geography]=[Customer].[Customer Geography].[Country].%26[France]

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

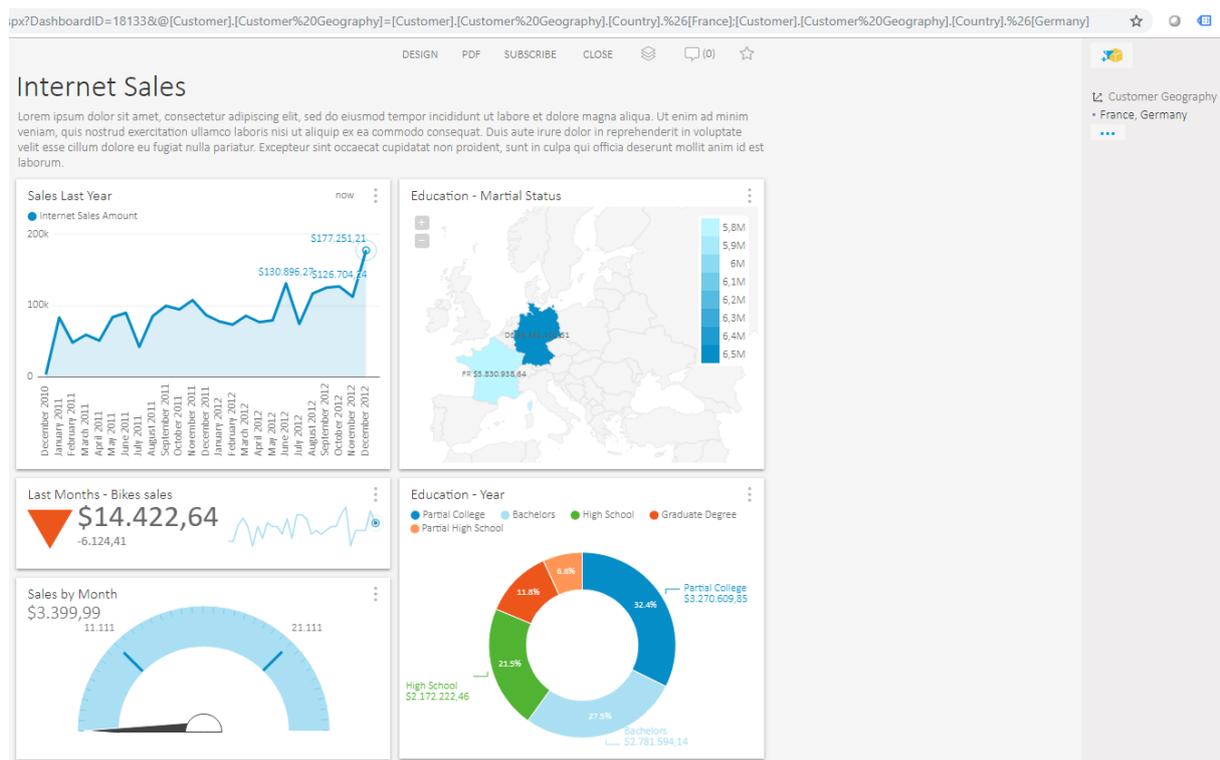
**@[Customer].[Customer Geography]=[Customer].[Customer Geography].[Country].%26[France];
[Customer].[Customer Geography].[Country].%26[Germany]**

... creating final URL ...

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



URL filters applied ...



9.6. Dashboard filters configuration

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

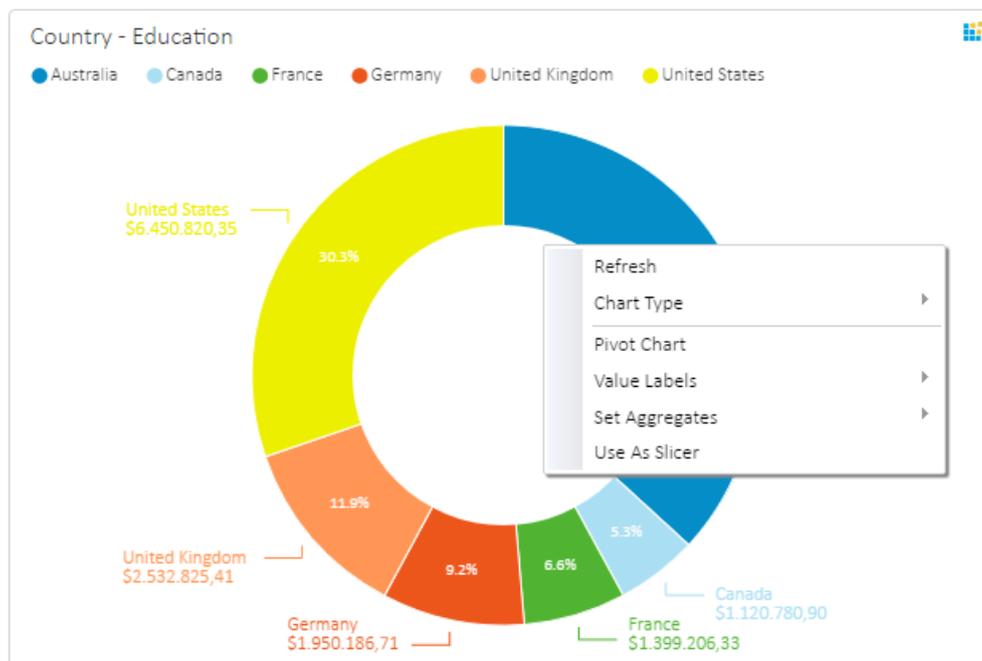
'Explicit Filtering Configuration' is the process in which a dashboard designer could select for each dashboard tile which dashboard filters it will use when retrieving data from data sources. On this way, a dashboard designer can fine tune, how filters will be implemented for each tile on the dashboard.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

The screenshot shows the configuration interface for a dashboard tile titled 'Country - Education'. The 'Data' tab is selected, and the query 'Country - Education' is entered. The chart type is set to 'Column Chart'. A bar chart displays data for six countries: Australia, Canada, France, Germany, United Kingdom, and United States. The chart is grouped by education level: Bachelors (blue), Partial College (light blue), Graduate Degree (green), and Partial High School (orange). The y-axis represents values up to 3.5M. A red arrow points to the 'Filtering Configuration' button at the bottom right of the chart area.

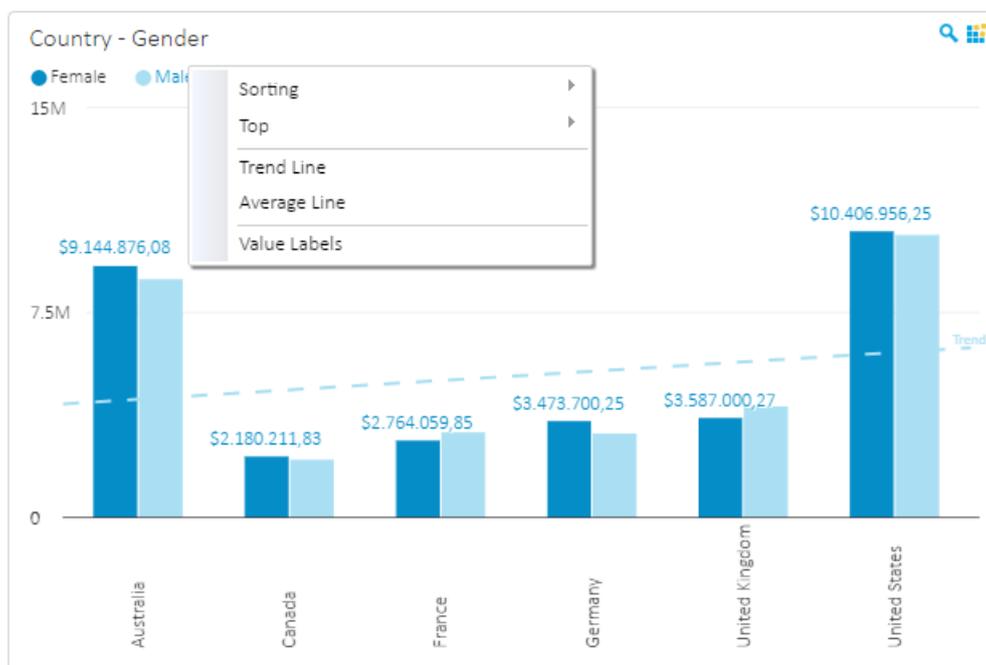
The 'Filtering Configuration' dialog box is shown. It has two radio buttons: 'Automatic' and 'Explicit'. The 'Explicit' option is selected. Below the radio buttons, there is a section for 'Accept Filters' with a dropdown menu. The dropdown menu is open, showing the following options: '(None)', 'Occupation', 'Gender', and '(Remove)'. The 'Occupation' option is highlighted. At the bottom of the dialog, there are 'Add Filter', 'OK', and 'Cancel' buttons.

9.7. End-User actions on the dashboard chart

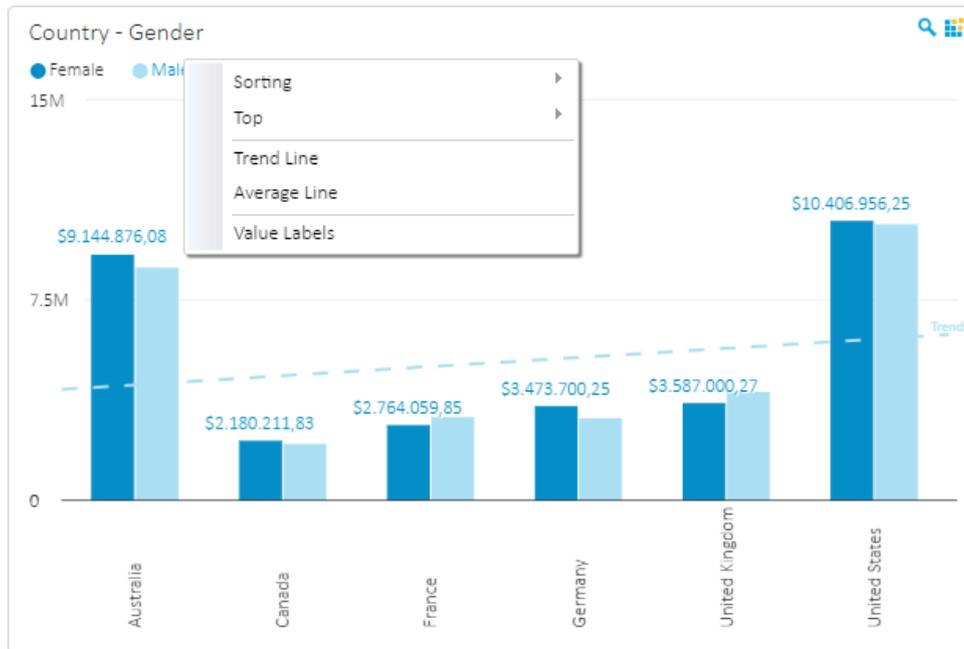
After the dashboard is rendered in the production usage to end-users, there are several options a user can choose to additionally arrange and visually analyze data. Right-click on the dashboard tile to show main user actions, such as 'Refresh' tile data, change 'Chart Type', pivot tile data category 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 the existing tile chart values or click on 'Use as Slicer' option to set tile chart to act as a dashboard slicer.



Right-click on the chart legend shows additional actions that could be used on a 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 a particular series of values on the chart.



9.8. Use a chart as 'Slicer' chart

From version 3.7 of Kyubit Business Intelligence app, end-user while working on the dashboard can choose several chart types and turn them into 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/Analytic Model data. At the same time, more than one chart on the dashboard could be set to work in a 'Slicer' mode, giving many possibilities to slice and analyze data of interest on the dashboard.

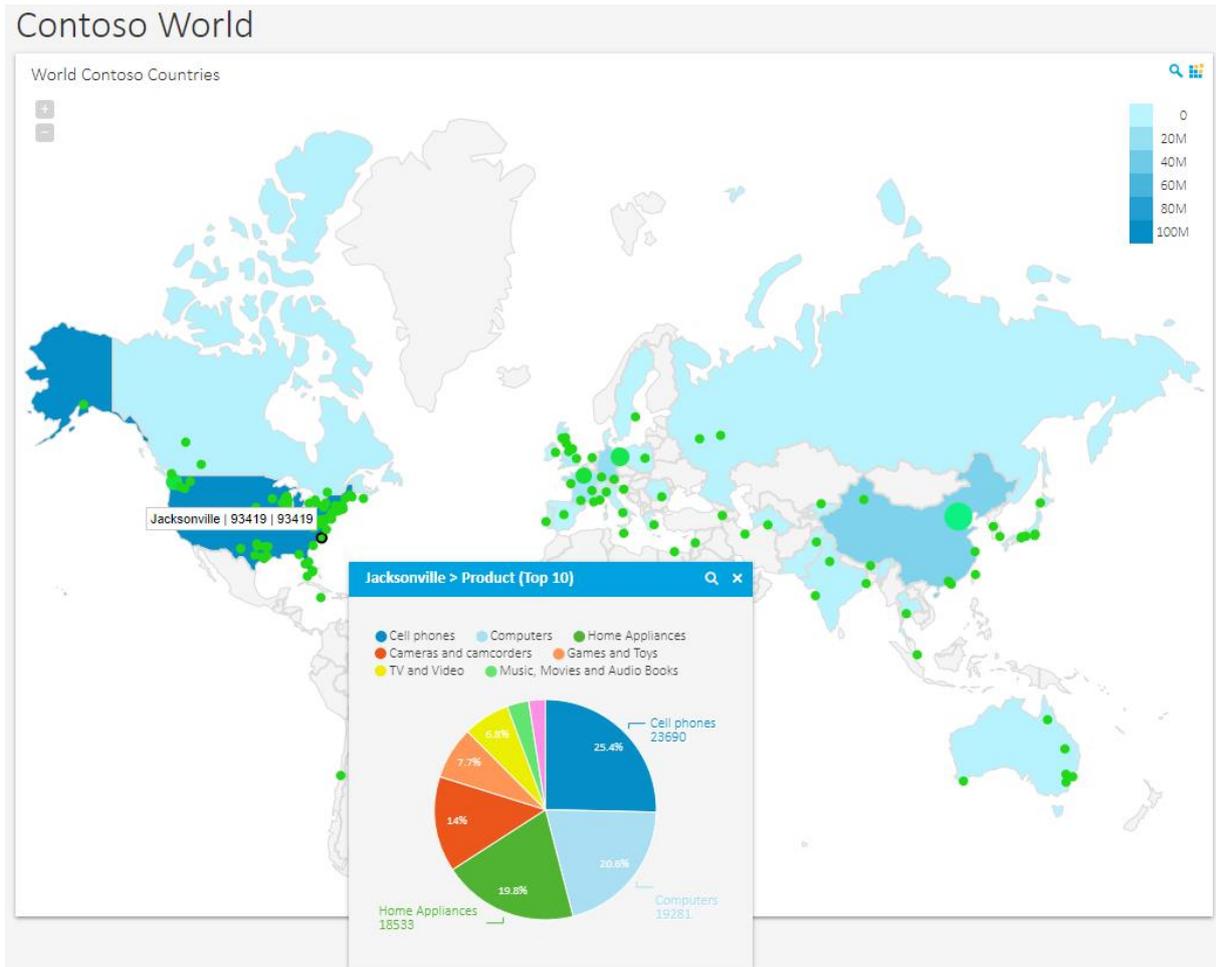


9.9. 'Quick Explore' dashboard analytic feature

'Quick Explore' feature is designed to get quick insight about specific chart segment related to some other dimension. For example, if chart displays the product sales values, with 'Quick explore' feature a user could get quick insight how specific product sales was in the past, by using 'Quick explore' with Time dimension. **Quick explore dimension** and **Quick explore chart type** could be defined on the dashboard chart during design time or production time by the designer or end-user.

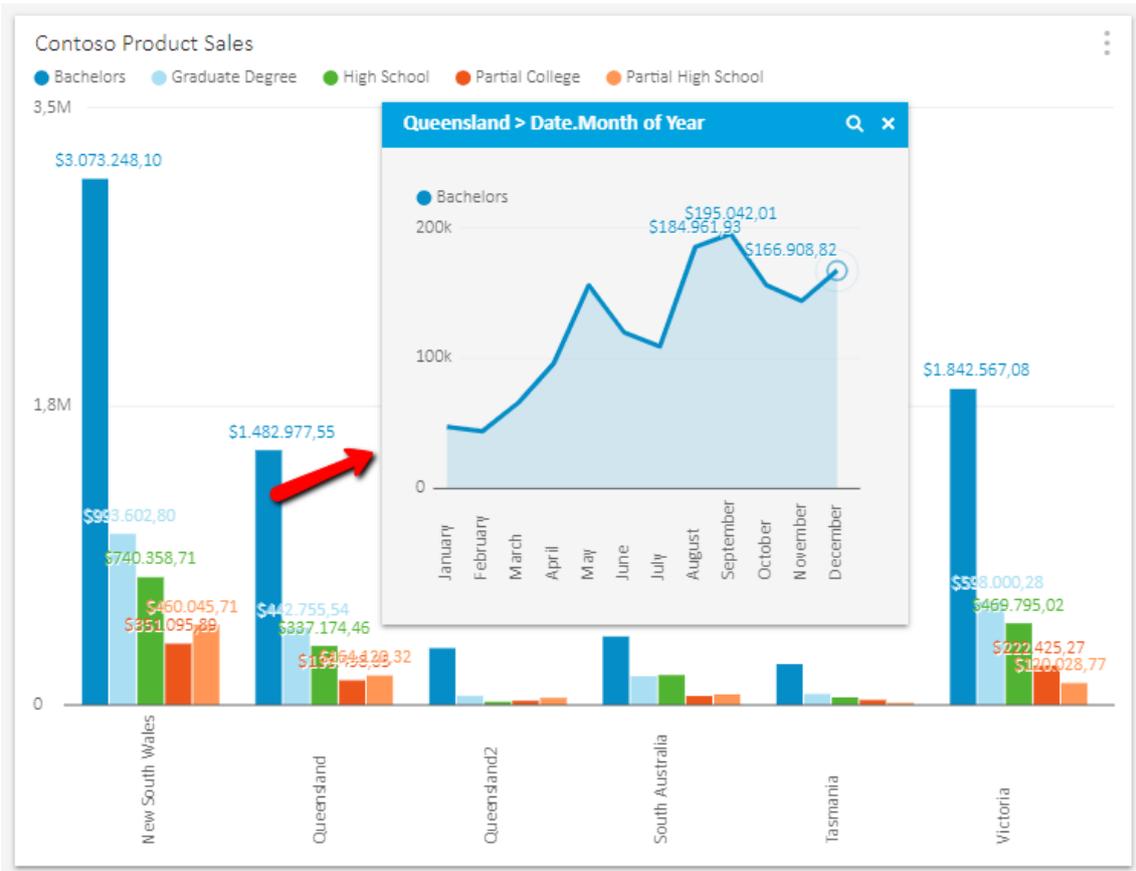
Once 'Quick Explore' feature is set, it is enough to click on the any chart segment to get small chart visualization of the selected member using other dimension.

'Quick Explore' display additional dimension in a small separate window ...

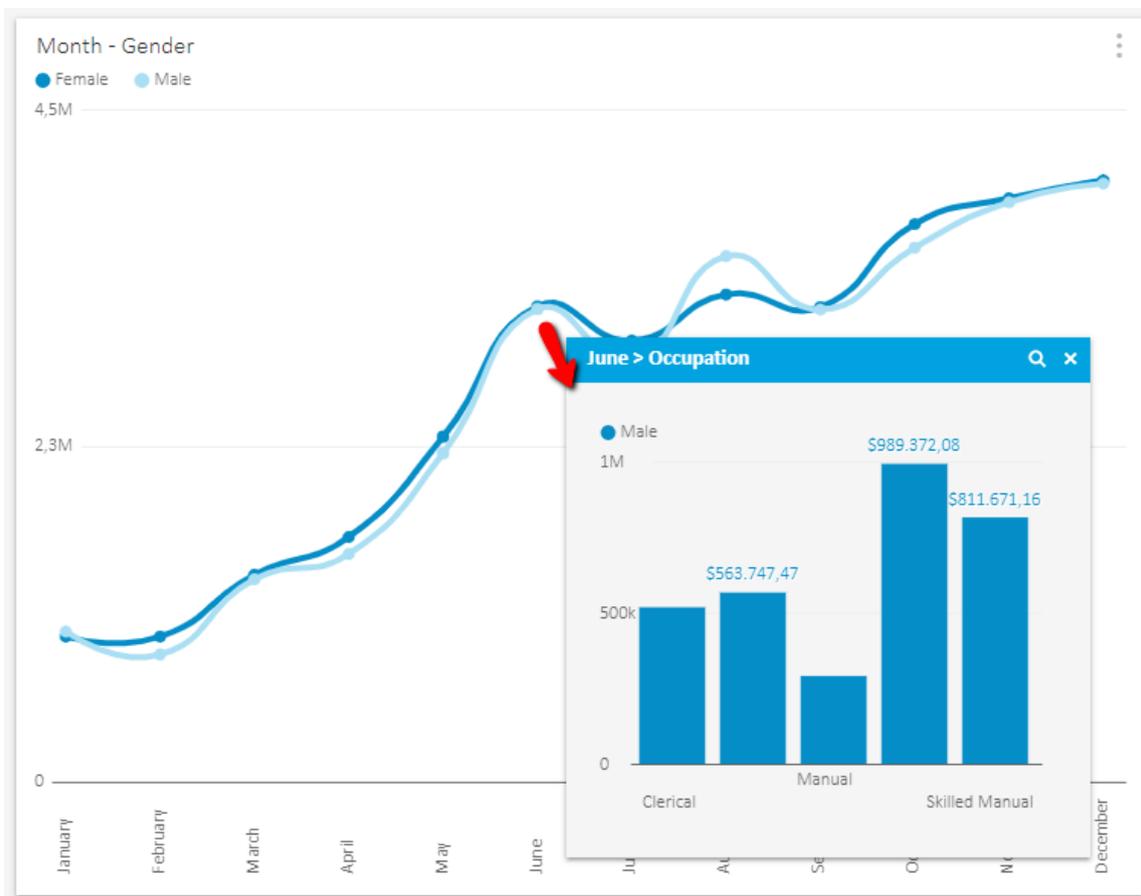


For example, when a user clicks on 'Jacksonville' city, 'Quick Explore' window will pop-up showing Jacksonville sales data by the products. Same could be applied for any measure and using various charts. 'Quick Explore' chart could be further drilled-down to a particular dimension or displayed as an enlarged chart in the full screen mode.

Click on the Queensland/Bachelors column open 'Quick Explore' values for the same item over the months ...

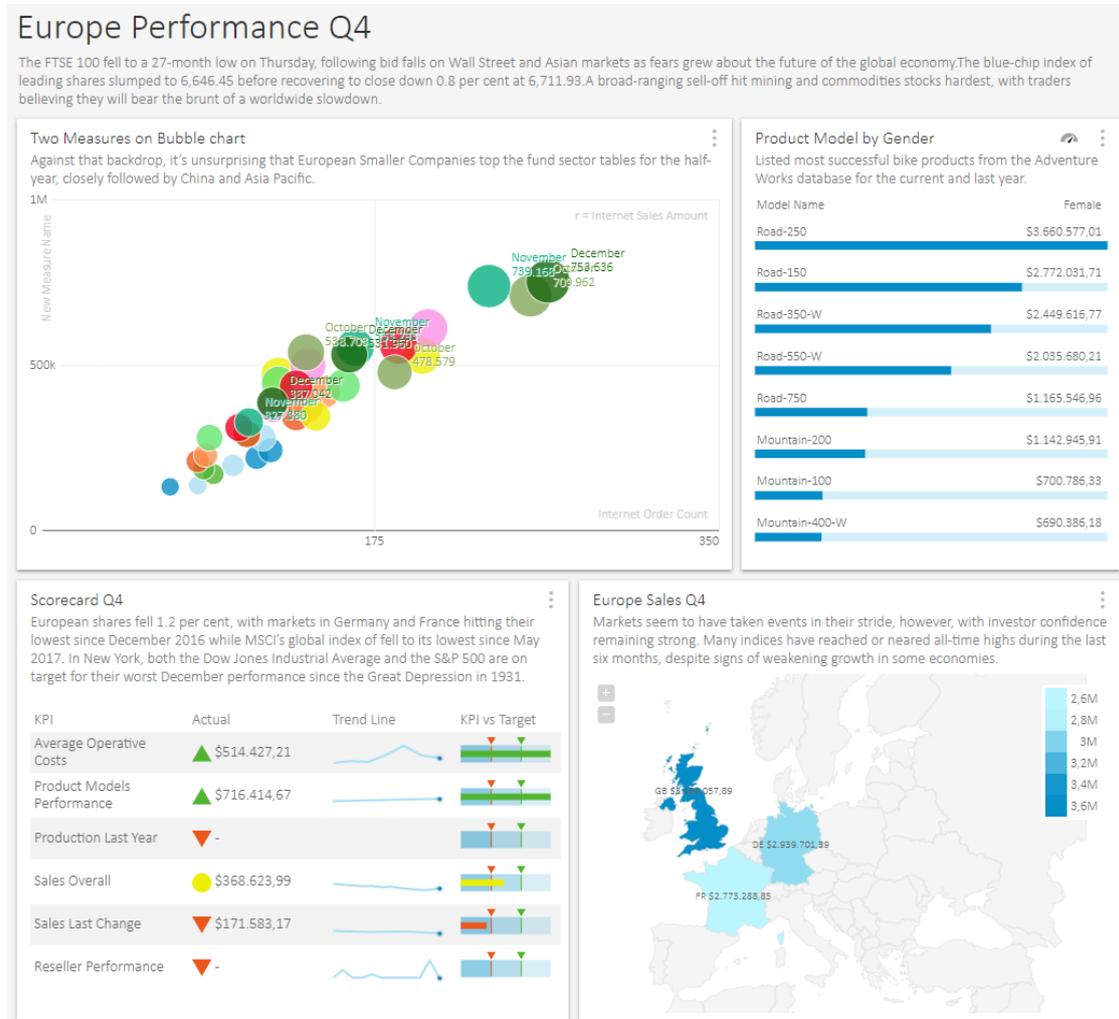


Click on the Male/June chart point opens 'Quick Explore' window with 'Occupation' data for the same point ...



10. Dashboard descriptive text features

The dashboard and its charts contain features to include text that would additionally describe the content for the end-user. Dashboard itself contains header and footer text that should generally describe dashboard overall content, while individual dashboard charts could have chart description text that explains the data on the particular dashboard chart.



10.1. 'Dynamic Text' on the dashboard

The text of the Dashboard can contain dynamic values from previously created analysis and queries. For example, now you can quickly set description text explaining which is the most sold product this year using the words.

Title > Region Sales by Fiscal Year

General
Data
Options

Name

Description

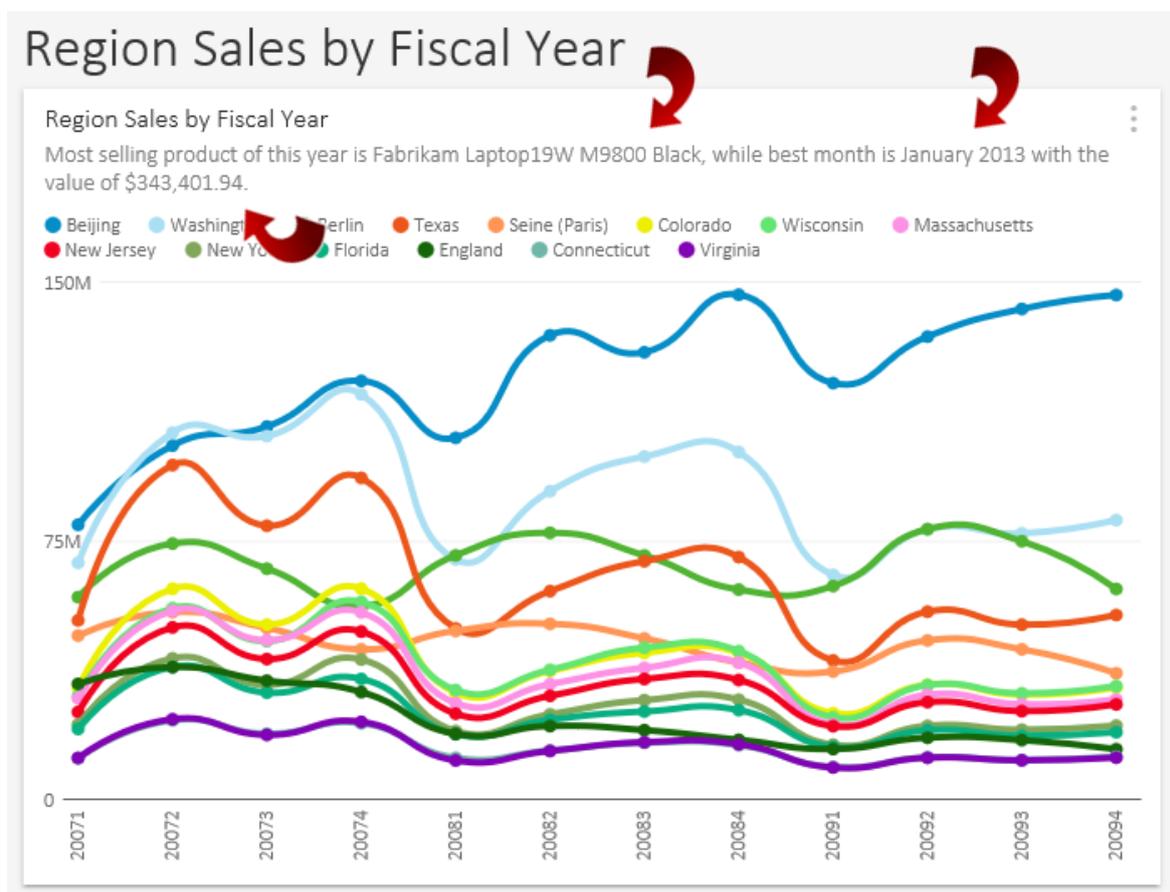
'Dynamic Text' picker icon ({}) suggests that this text input could contain dynamic values that are result of existing query/analysis execution. First cell in the query/analysis will be taken as relevant and its data will be inserted in the existing text input on the position as specified. Dynamic text placeholder that consist of double curly brackets will be replaced by the value from query or analysis. Dashboard designer could manually set dynamic text by adding query/analysis ID into double curly brackets (for example, {{A101}} for analysis with ID 101 or {{Q202}} for the query with ID of 202) or he could click on the 'Dynamic Text' picker icon ({}), which will open dialog to search and select existing query or analysis and its ID will be embedded to existing text at the precise position where cursor was positioned at the time picker was selected.

'Dynamic Text' with first **item name** from query or analysis is defined with ID inside curly brackets.

For example, {{A101}}

'Dynamic Text' with first **item value** from query or analysis is defined with ID inside curly brackets with hashtag (#) after ID number.

For example, {{A101#}}



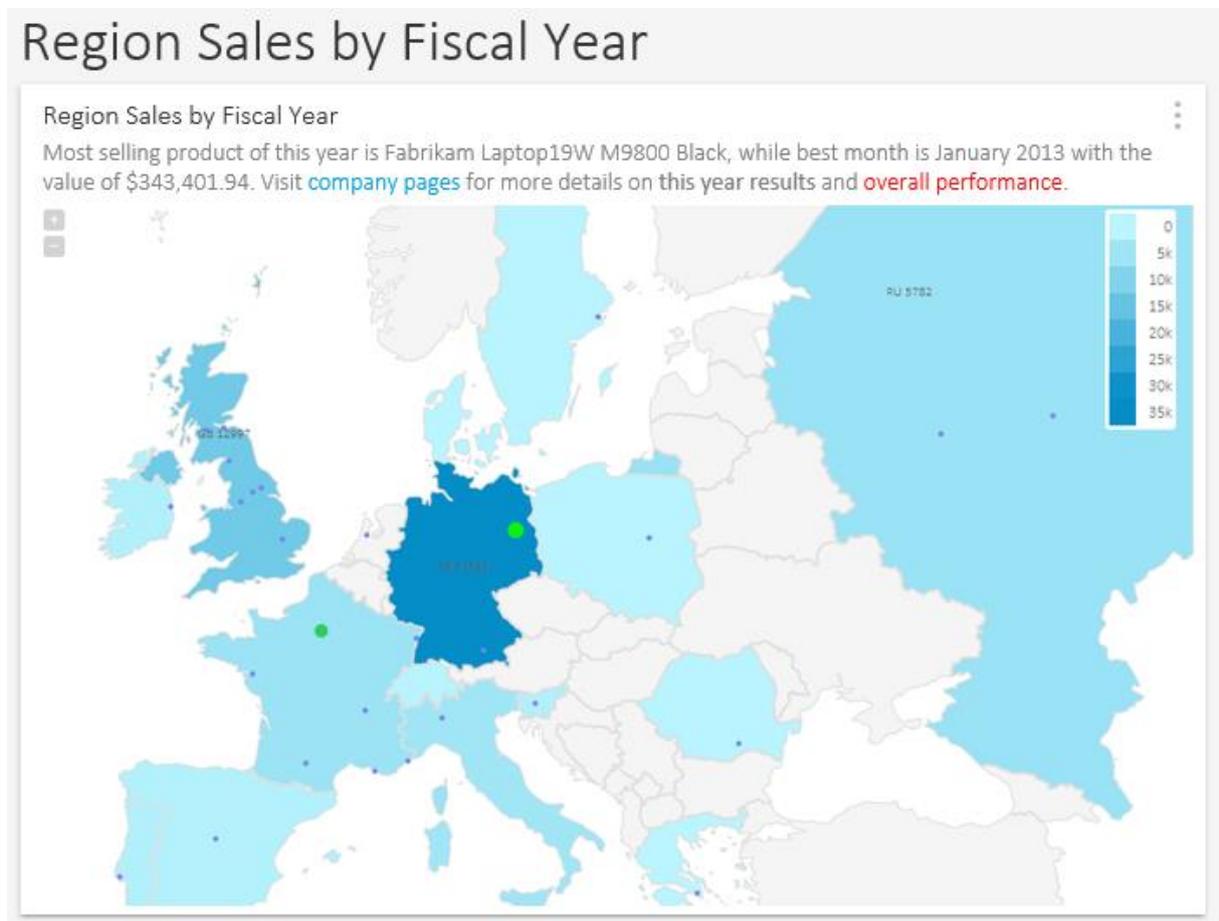
10.2. HTML support for dashboard descriptive text

The text of Dashboard Header/Footer and Tile Description can contain HTML, which is a convenient way to provide enhanced text for end-users but also to add a custom link or similar. Inside dashboard header/footer or tile description simply enter HTML text, that will be rendered on the dashboard. This feature should not be used to add some complex HTML to text descriptions. While exporting dashboard to PDF, plain text (without HTML) will be used.

Tile > Region Sales by Fiscal Year

General	Data	Options
Name	Region Sales by Fiscal Year	
Description	Most selling product of this year is {{A12237}}, while best month is {{A15}} with the value of {{A15#}}. Visit company pages for more details on this year results and overall performance .	

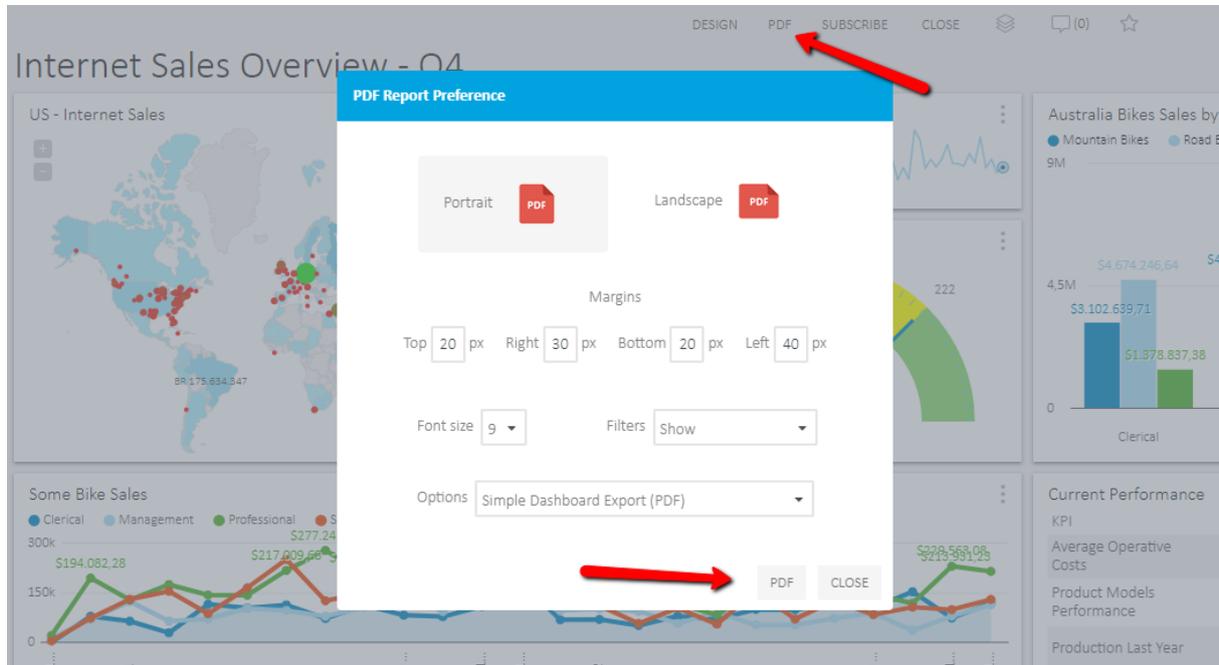
Rendered dashboard chart with HTML in the description text ...



11. Exporting dashboard to a PDF file

A user can export complete dashboard or particular dashboard chart to the PDF file at any time. PDF export features include **Simple** and **Detailed** dashboard export and additional options for end-user to select PDF document settings.

Simple export ...



Simple export PDF file ...



A **'Simple'** dashboard export, creates PDF file that contains all the charts on the single page. If dashboard contains 'Table' charts, those are rendered on the subsequent pages, because it is not possible to render many rows and columns on the single page.

A **'Detailed'** dashboard export created PDF file that contains each dashboard chart on a separate page. First page is dashboard title and index of dashboard charts. User can opt to export charts with values, in which case below every chart there will be table of chart values used to render visualization.

PDF Report Preference

Portrait Landscape

Margins

Top px Right px Bottom px Left px

Font size Filters

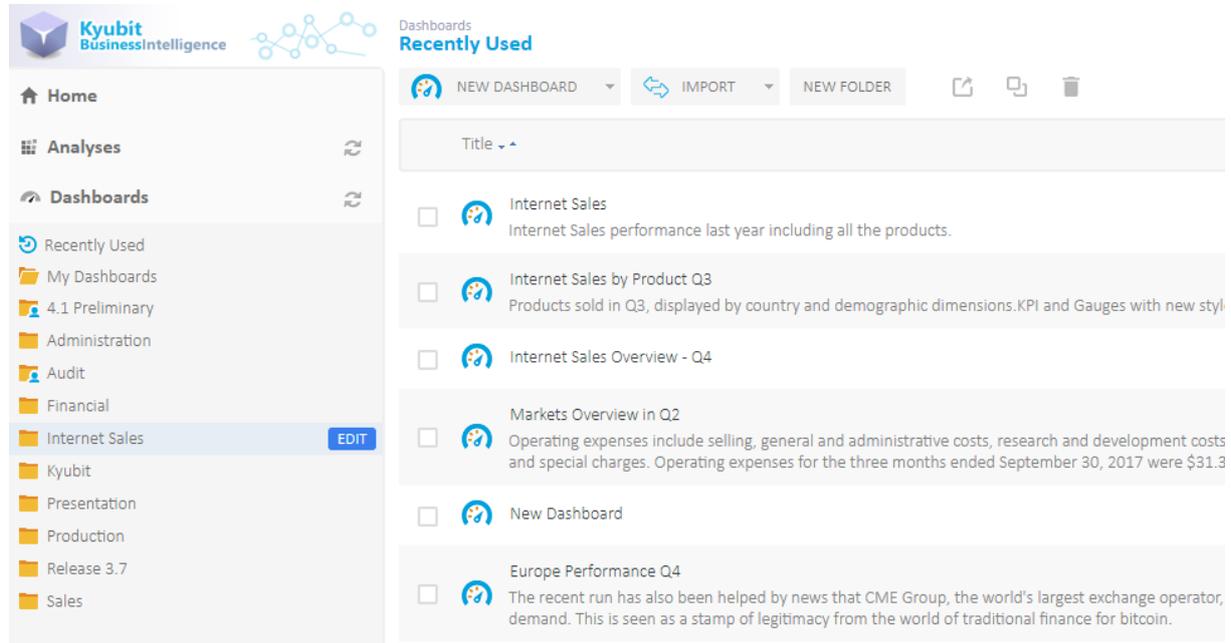
Options

Rendered 'Detailed' PDF export of the dashboard ...



12. Folders and dashboards access permissions

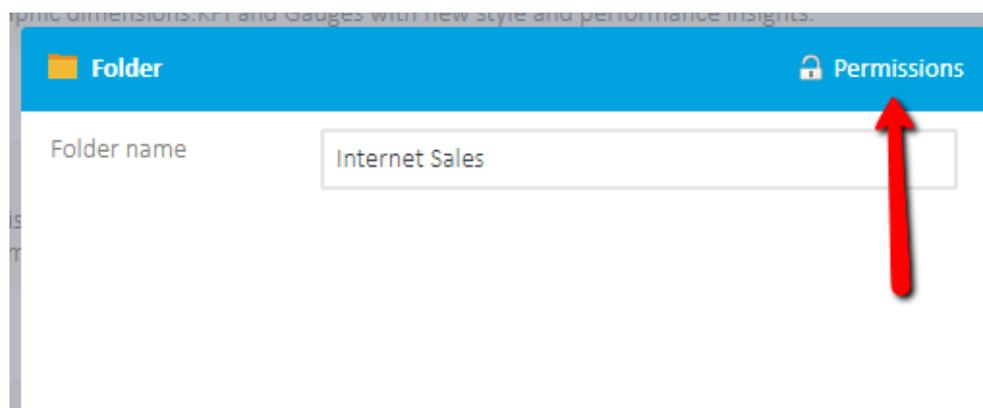
To group more dashboards into a logical group that shares same user permissions, **folders** could be created to contain any number of dashboards. When created, dashboard by default is located in 'My Dashboards' folder, visible only to the dashboard creator. At any time, user can share the dashboard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



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

12.1. 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 Active Directory/Windows/Kyubit users and groups to set the appropriate permissions. (depending on which authentication is configured for Kyubit application)

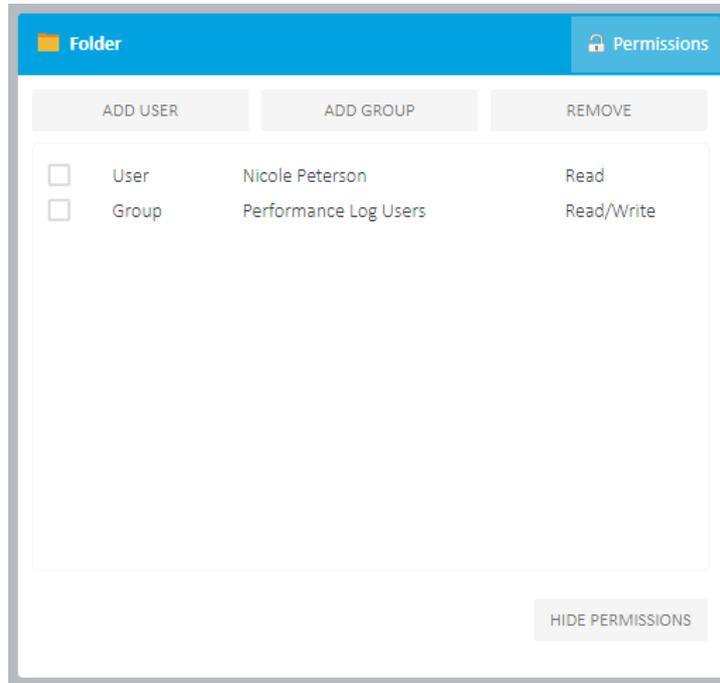
Read/Write permission gives full rights to the user on the folder and all dashboards within that folder.

Read permission gives the right to see the folder and open all dashboards within that 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 the folder and all dashboards within that folder.

Find users

Domain name	Real user name or Group name	
<input type="text" value="Kyubit"/>	<input type="text" value="te"/>	<input type="button" value="FIND"/>
<input type="checkbox"/>	 test11	
<input type="checkbox"/>	 test2	
<input type="checkbox"/>	 test3	
<input type="checkbox"/>	 test5	
<input type="checkbox"/>	Everyone (Unrestricted access)	
<input type="button" value="ADD READ/WRITE ACCESS"/>		<input type="button" value="ADD READ ACCESS"/>
		<input type="button" value="CLOSE"/>

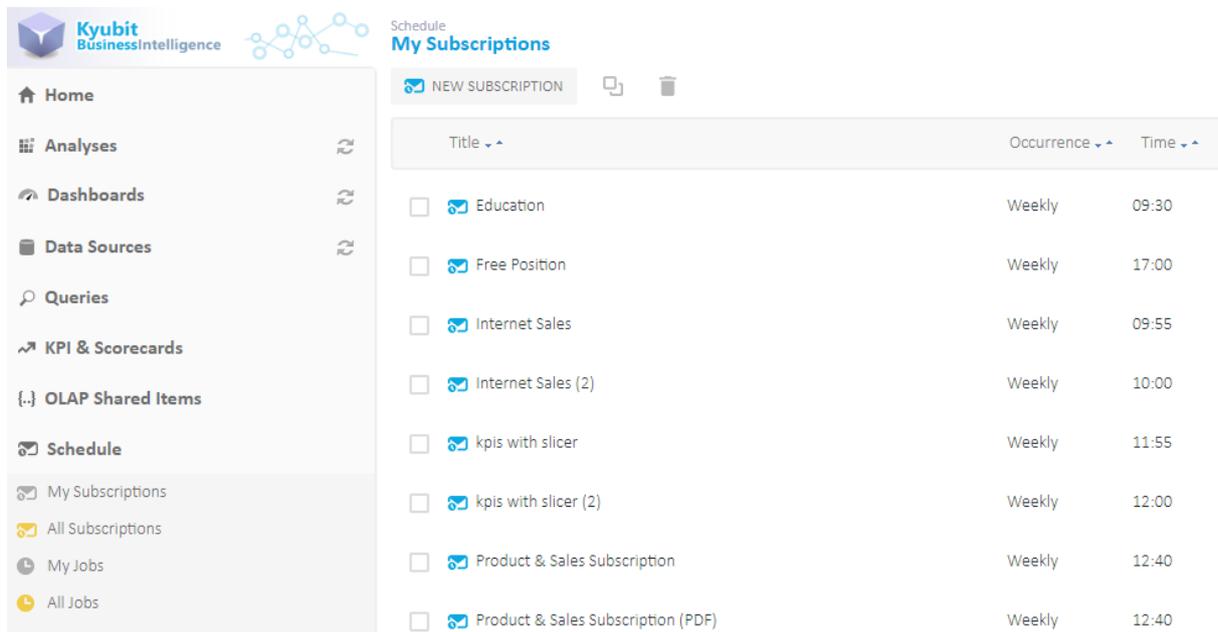


13. Subscriptions

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

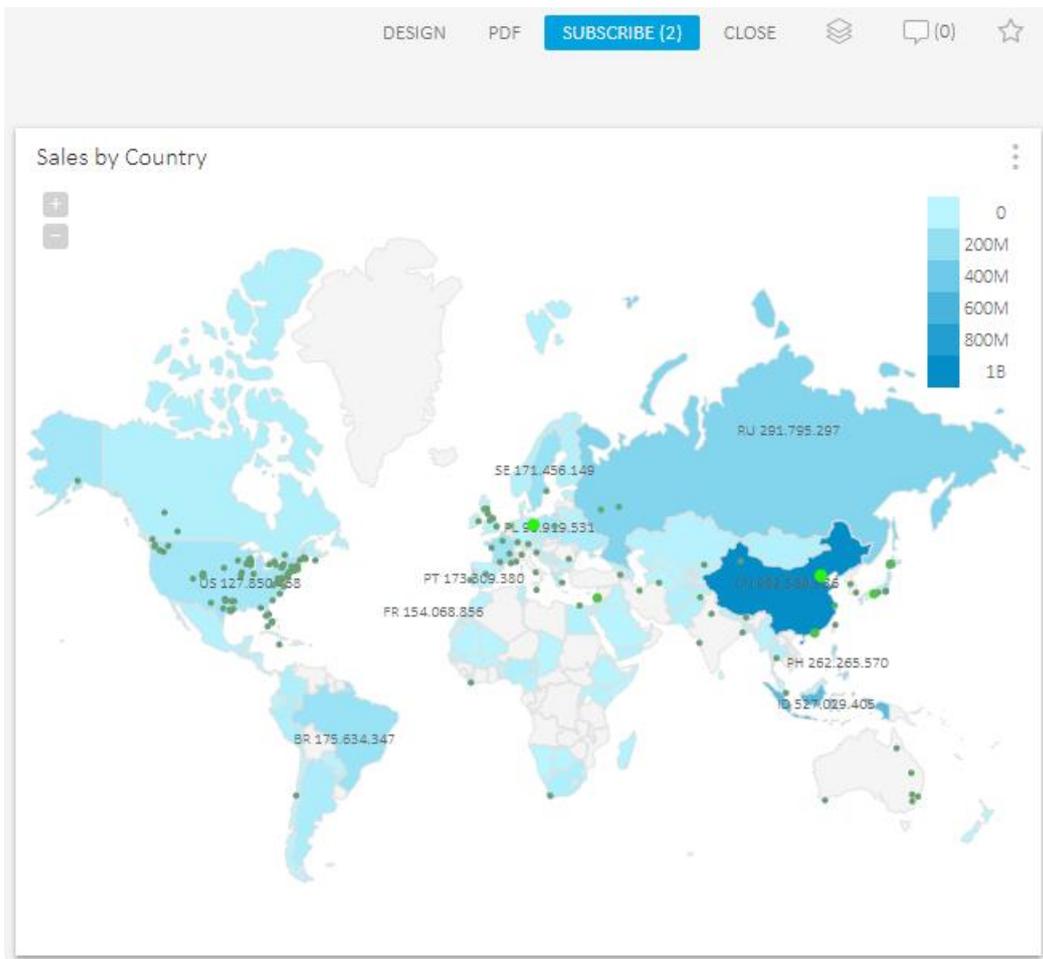
13.1. My subscriptions

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

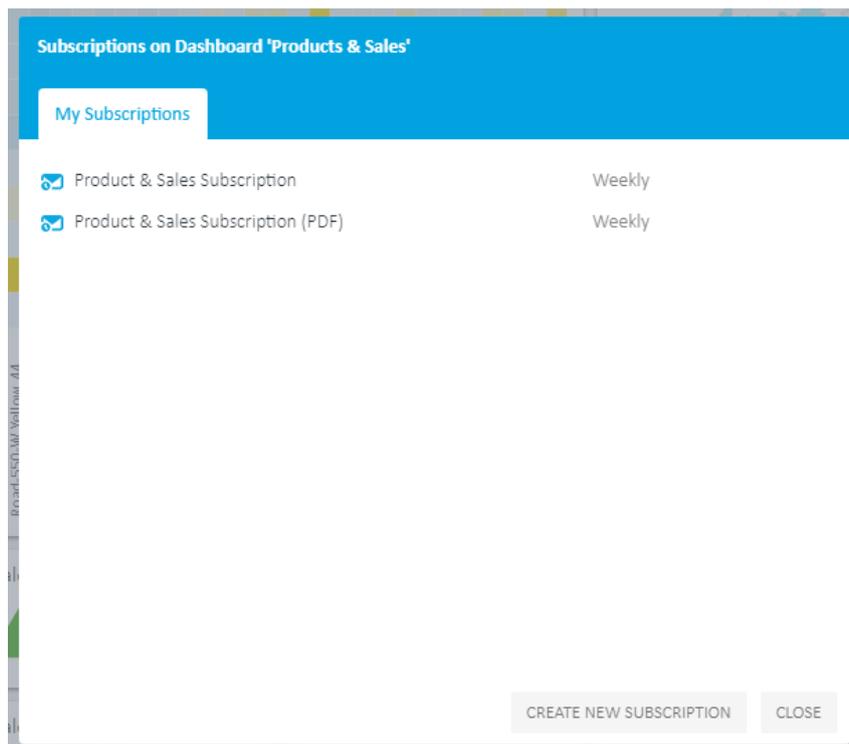


13.2. Subscriptions within the dashboard

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



By clicking on “Subscribe” link, form with existing subscriptions of the current user will be displayed with the option to create a new subscription, edit or delete existing.



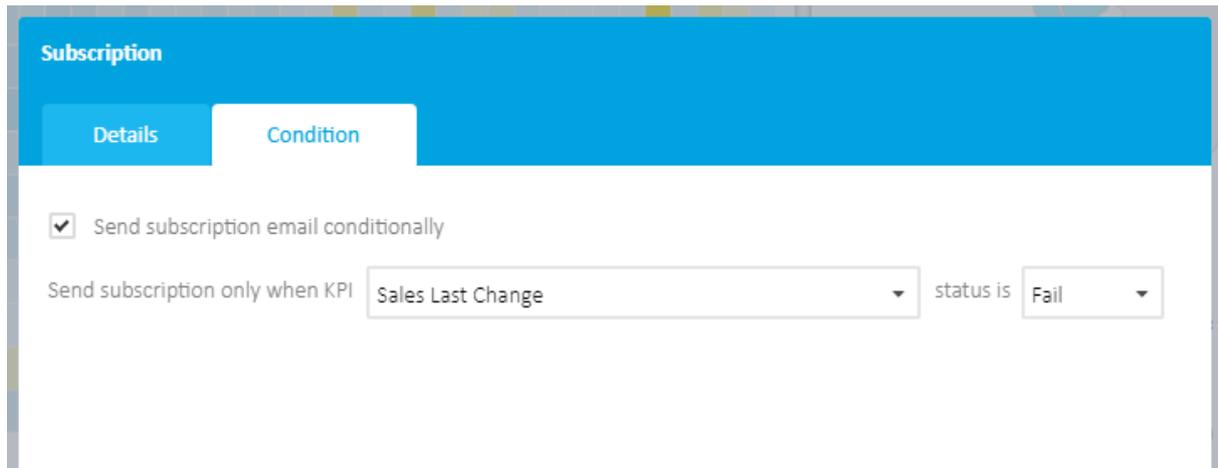
13.3. Subscription details

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

- **Subscription title** sets the name that will appear when delivering the dashboard/analysis inside the email message.
- **Subscription item** selects Kyubit Business Intelligence content (Analysis or Dashboard) to deliver within the subscription. The user can subscribe to all content with at least 'Read' permission.
- **Occurs**, defines the scheduled time to deliver the subscription. There are three different time scheduling categories:
 - **Weekly**, set the weekdays to deliver the subscription
 - **Monthly**, set the month days to deliver the subscription
 - **Once**, set a single day to deliver the subscription
- **Time** sets the time within a day to deliver the subscription
- **CC Recipients**, an optional list of email addresses to deliver the 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 (Simple)**
 - Link + **PDF dashboard document (Detailed)**
- **Disable** - All subscriptions marked as 'disabled' will not be delivered at the scheduled time.

13.4. Send subscriptions conditionally

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

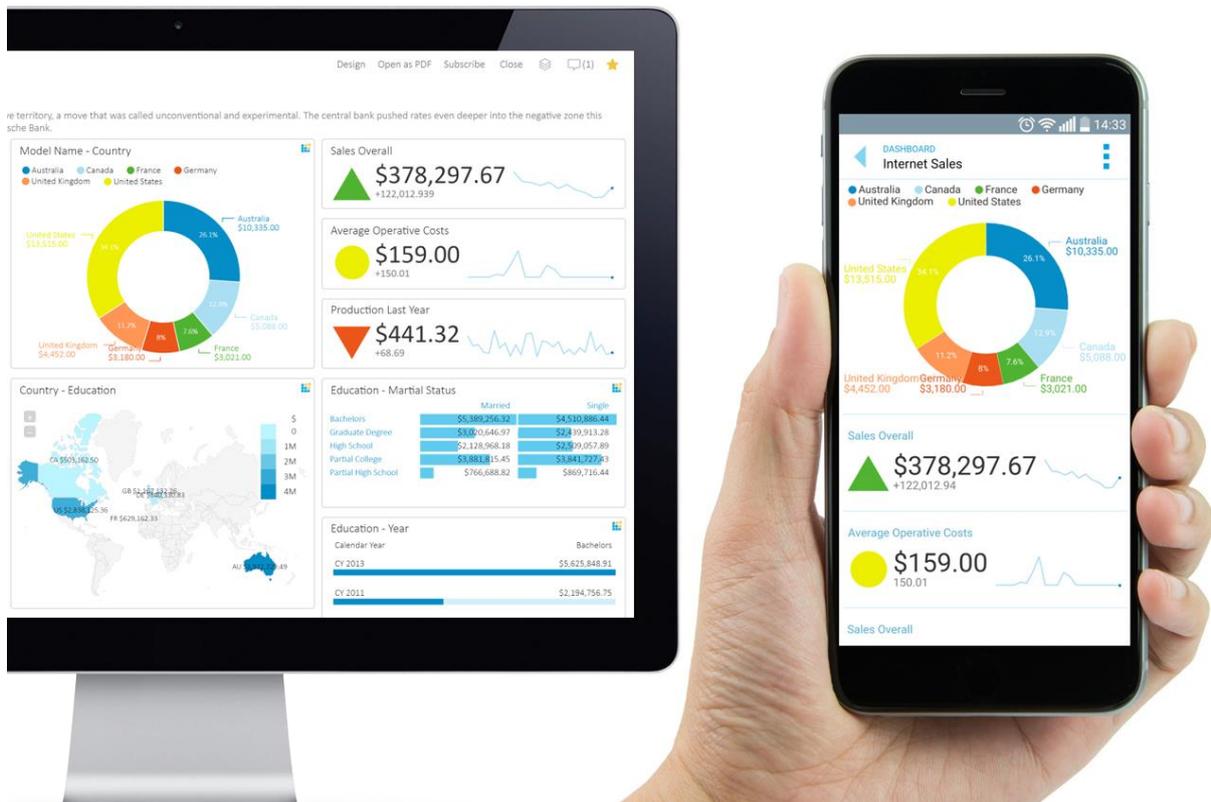


The screenshot shows a 'Subscription' configuration window with two tabs: 'Details' and 'Condition'. The 'Condition' tab is active. It features a checked checkbox labeled 'Send subscription email conditionally'. Below this, there is a label 'Send subscription only when KPI' followed by a dropdown menu containing 'Sales Last Change'. To the right of this dropdown is the text 'status is' followed by another dropdown menu containing 'Fail'.

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

14. Mobile Dashboards View

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



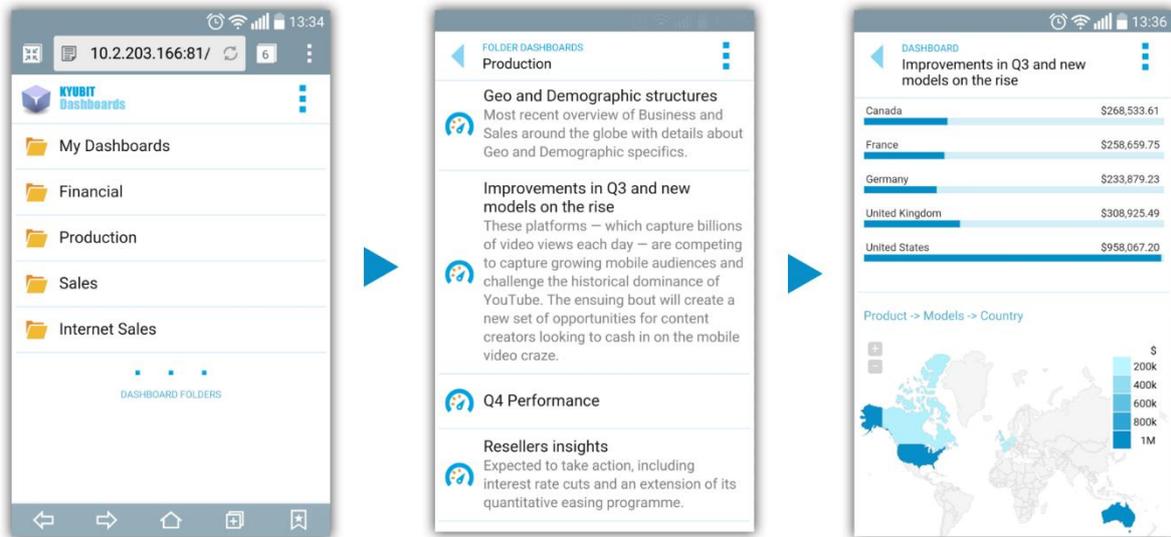
14.1. Connect Mobile Device to Kyubit Business Intelligence

To connect to Kyubit Business Intelligence and display created dashboards, simply open the 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 the 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:

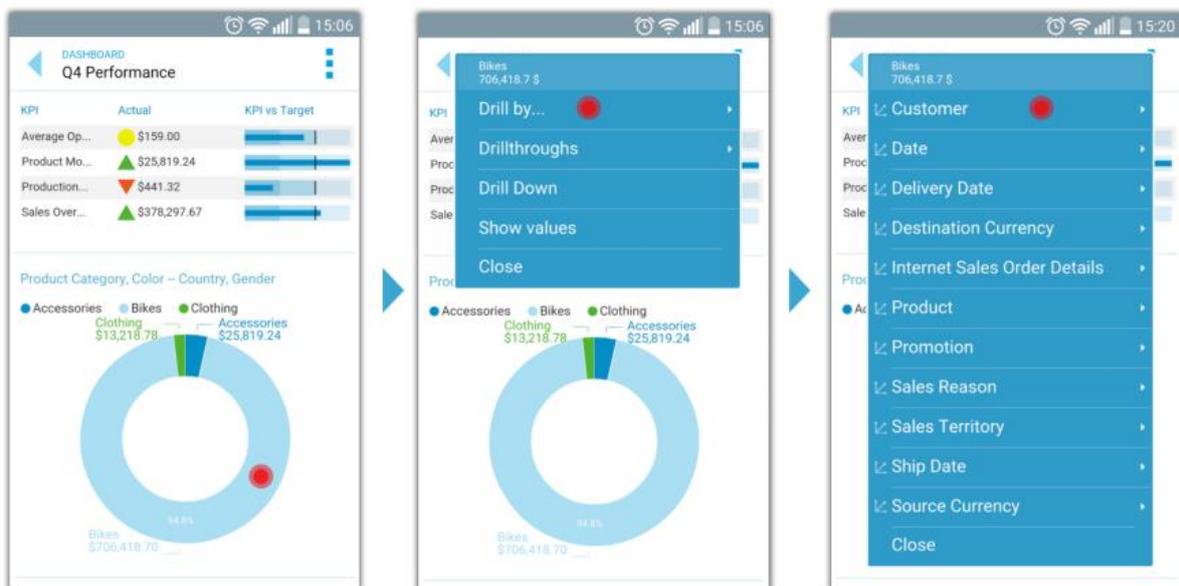
- 1) Find your server IP address. (Command prompt -> IPCONFIG)
- 2) Type URL to the mobile device browser together with the port number and /Mobile/Index.html (For example, <http://10.2.203.166:81/Mobile/Index.html>)
- 3) The first time you will need to enter your Windows/Kyubit credentials to access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

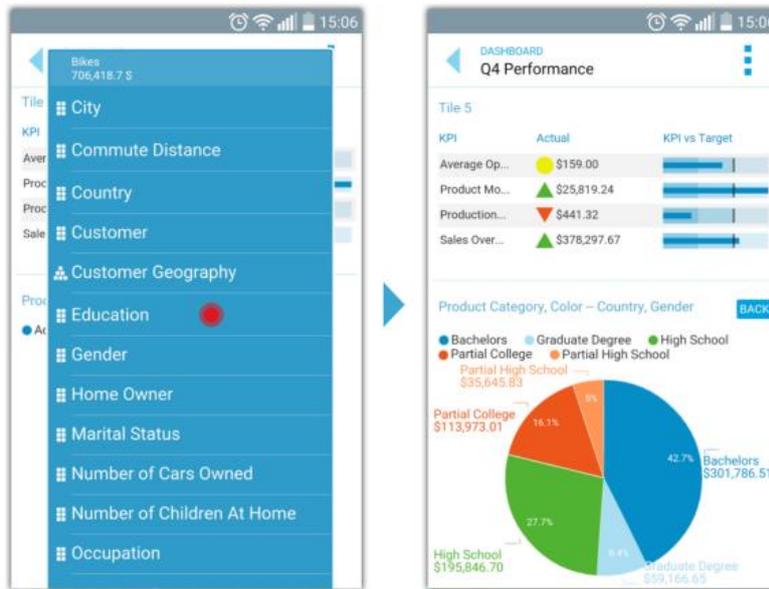


12.2. OLAP Analysis on Mobile Dashboards

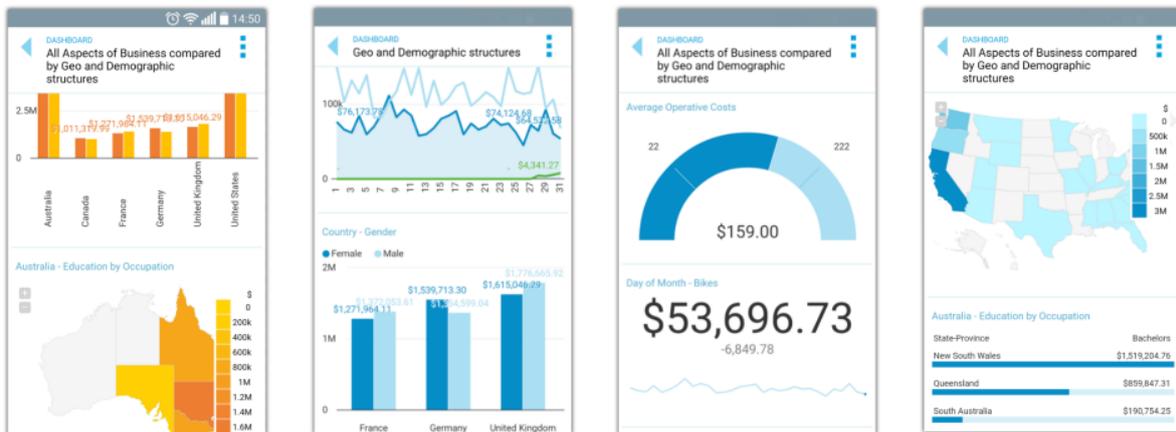
Perform OLAP analysis **Drill-Down** and **Drill-through** actions to find more in-depth details of your data with the touch of your fingers from Dashboards Mobile view. Select OLAP dimension level to Drill the current data with multiple Drill-Down steps or get back to the previous state of analysis.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

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





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



15. Multipage Reports

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

To create a Multipage report, follow these steps:

- 1) Click on a '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 the Description for Multipage Report and Save it.
- 5) Multipage Report is displayed in the Folder with Dashboards and could be shared with other users by moving to any shared folder.

Multi-Page Report

Name: Sales Performance Overview

Description:

Analyses | Dashboards

- Australia - Education by Occupation
- Country - Education
- Country - Gender
- Date - Product Model Name
- Day of Month - Bikes
- Education - Martial Status
- Education - Year
- Employee - Reseller
- Geography expanded
- Home Owner -> Product Model Decomposition
- Home Owner -> Product Model Decomposition
- January Sales - United States
- Model Name - Country
- Month of the Year - Occupation

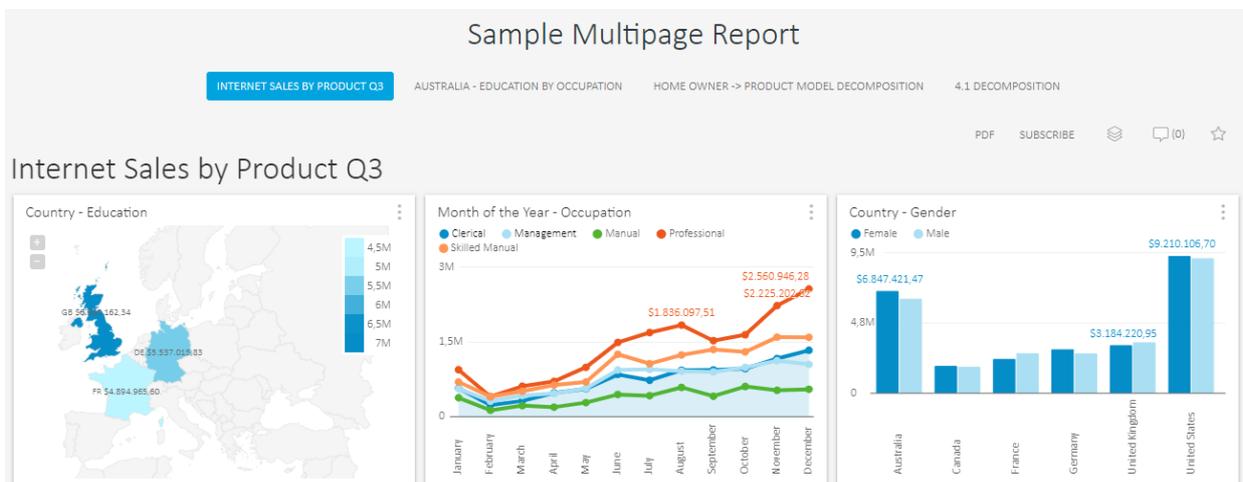
Refresh

Report Pages

- Financial Overview
- Geo and Demographic structures
- Education - Year
- January Sales - United States
- Model Name - Country

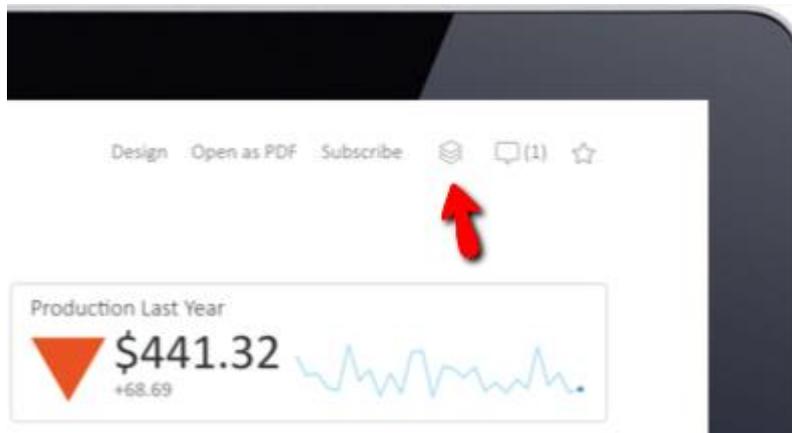
Select/Deselect All | Up | Down

Save | Close



16. Dashboard Data Slideshow

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

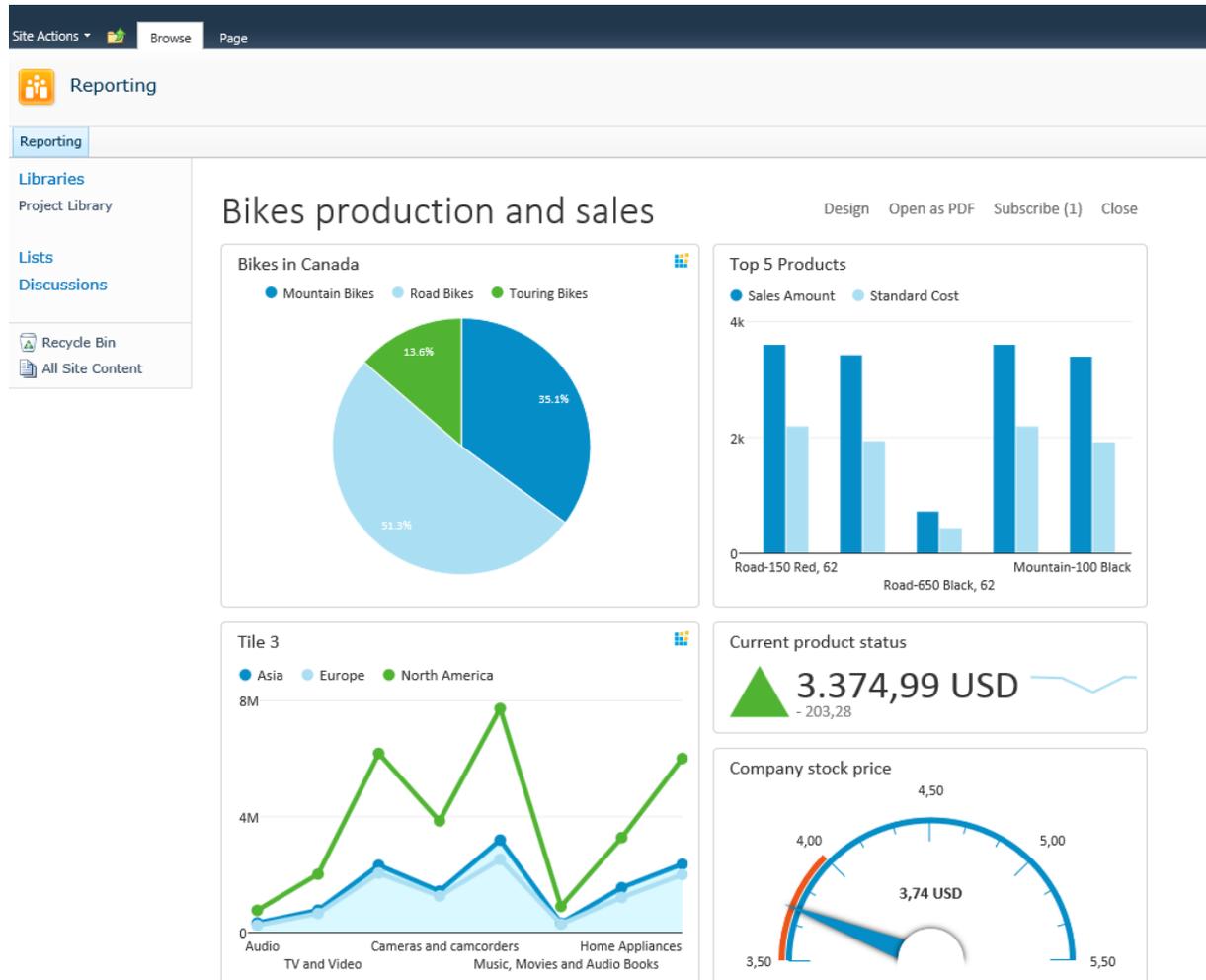


While designing Dashboard user set slides transition duration and caching options that could cache returned data and not query data sources for the same visualization for a defined time in minutes. All dashboard visualizations are transformed to full-screen mode during slideshow presentation, presenting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



17. Integrate dashboards with other web applications and sites

The dashboard created within the Kyubit Business Intelligence application 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 the 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&tileFo
ntSize=11px&hideDesignButton=1&hideCloseButton=1&hideOpenPDFbutton=1&hideSubscribeButton=1"
width="800px" height="1000px" frameborder="0" scrolling="no"></iframe>
```

18. 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.

18.1. Continents

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

18.2. 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

18.3. 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

18.4. 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

18.5. 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

18.6. 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

18.7. 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

18.8. 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

18.9. 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

18.10. 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

18.11. 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

18.12. 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

18.13. 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

18.14. 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

18.15. 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”.

18.16. US – Map of all US counties

This map has special requirements as it contains lots of data.

To relate data with particular county, category items should be names as US State Acronym–US County Name.

For example, “CA-Santa Barbara”.