Customizing SQL Server 2016 Mobile Report Publisher
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Speaker info

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- Italian, former working as BI developer in an italian bank. Four weeks ago joined Widex a danish company which manufactures hearing aids, as BI Specialist.
- Focused on database development, datawarehousing, cube development, reporting, data analysis, etc.
- Speaker at SQL Saturdays, and other community-driven events in Europe, (MS Cloud Summit, SQL Konferenz, SQL Nexus, SQL Days, ...). Speaker in webinars for PASS Italian VC, DW/BI VC.
- Author for sqlservercentral.com, sqlshack.com, UGISS (User Group Italiano SQL Server).
Agenda

• Intro to Mobile Report Publisher
• Drill-trough and navigation
• Parameters & filtering
• Maps
• Customization & color branding
• Security
• Some tips on data format
Mobile Report Publisher
Mobile Report Publisher

**SQL Server Mobile Report Publisher** is the reporting tool explicitly dedicated to create and delivery mobile BI.

It is based on **Datazen** technology a company acquired from Microsoft on April 2015. Datazen products were merged into SQL Server 2016 to build a complete BI platform for viewing reports on phones and tablets.

With Mobile Report Publisher developers can easily realize reports, dashboards and KPIs and publish immediately on every device. Everything integrated natively into SQL Server Reporting Services 2016.
Mobile Report Publisher

Mobile Report Publisher key features are:

- Quickness and simpleness. It's really easy to use
- Unified dashboards designer for any visualization
- KPI repository
- Automatic rendering in any screen size
- Data sources availability
Layout for mobile devices

Rendering fitted for any device.
Set up a different layout for any device in order to guarantee perfect scaling to all screens size:

• Mobile phones
• Tablets
• Laptops
• Desktops
• Large screens
Mobile Report Publisher

Dashboards are built locally on developer's computer using the Publisher app and then published on Reporting Services or Power BI report server.

Contents are accessed via mobile clients and web browsers which connect to SSRS server securely.
Mobile Report Publisher

What do I need to publish reports?

To create and publish reports you need:
• SQL Server 2016 Mobile Publisher on your pc
• SQL Server 2016 Reporting Services/Power BI Reports Server with:
  o A data source
  o A dataset
• Power BI app on mobile devices (smartphone, tablet)
Mobile Report Publisher

• create a data source
• create a dataset (Product Inventory)
• create a report
• connect to a server
• publish and display reports on the server
• access reports from mobile device
Drill-Through and Navigation
Drill-through

Set up drill-through for navigation through different detail levels

Category

Subcategory

Product

Back and forth
Drill-through

You can also set up a drill-through to a custom URL (any URL), for example a paginated report, or a mobile report placed on a different server.
Drill-through and tabbed report
Parameters & filtering
Parameters

Create a dataset with parameters and afterwards you can use them to filter your mobile report. This approach gives you more flexibility than the internal drill-through and allows the mobile report to be filtered from any calling object.

For Analysis Service write this url:
http://<servername>/reports/mobilereports/<report-folder-name>/<report-name>?<dataset-name>.<field-name>=<parameter-value>

For SQL Server write this url:
http://<servername>/reports/mobilereports/<report-folder-name>/<report-name>?<dataset-name>@<field-name>=<parameter-value>
Parameters

Another type of parameters are **Selection Control parameters**, i.e. parameters bound to a *navigator object* in the report.

Selection control are listed when trying to configure a URL for drill-through.

URL example is:

The special control Time Navigator can be filtered by passing Start and End date to define an interval.
Parameters

Enable – disable report title

By using parameters, you can also enable/disable the report title via URL. To disable the title, simply add “?title=false” to your URL, for example:

http://servername/reports/mobilereport/Sales%20Summary?title=false
Parameters

1. Dataset with parameters
2. Paginated report to filter dataset with parameters
3. Open a mobile report with specific query string parameters
4. Open a mobile report with selection controls parameters
5. Enable/Disable title with parameters
Maps

Mobile Report Publisher provides three different types of maps visualizations:

**Gradient Heat Maps** - filled areas with different color saturation.  
**Range Stop Heat Maps** - comparison between target and real values.  
**Bubble Map** - points over an associate region area. Radius is determined by the displayed value.
Built-in Maps

There are some built-in maps ready for use.

You need to be aware that to display values on the map you must have a data column that matches the key column for the built-in map.
Custom Maps

Beyond the standard map you can create your own custom maps, according to your needs. This kind of maps are made by shapefiles .shp, a format initially defined by Esri. Nowadays, shapefile is universally recognized as standard for mapping.

Basically a shapefile is a vector which stores geographical attributes.

Usually a shapefile consists of few files joint together in a single .zip
Custom Maps

For being used from Mobile Publisher a shapefile must match the following criteria:

- Must be made of at least two files
  - .SHP file for describing geometries and attributes
  - .DBF file for metadata
- The file names must be the same (Germany.shp, Germany.dbf)
- The metadata file must include a column called NAME with the value of the corresponding shape’s key to be used when populating the map with data
- The two file together cannot be bigger than 512 KB
Custom Maps

How to create a shape file?

A shape file is created and edited by specific software called GIS (Geographical Information System).

Online there are many resources available, from which you can download shapefiles ready to use:

Diva-GIS: http://www.diva-gis.org/Data

OpenStreetMap: http://openstreetmapdata.com/data

A Microsoft developer Christopher Finlan, made it available many shapefiles specially suited for Mobile Publisher.

https://christopherfinlan.com/2016/05/22/sql-server-mobile-reports-free-maps-of-the-week/
Maps

- Creating a report with a built-in map
- Creating a custom maps and adding to the report
Site customization & color branding
You can customize the entire platform for Reporting Service, applying your company colors and logo.

The brand package for Reporting Services consists of three items and is packaged as a zip file.
- color.json
- metadata.xml
- logo.png (optional)

The file names must be kept as listed above.
The .zip file can be named however you like.
Customization for mobile

The colors.json file contains the section **Theme** which includes items that are specific for mobile reports.

- **Background color**
- **Data points** with options for good (green), bad (red), and neutral (yellow).
- **Accent, maps, colors, panel backgrounds**
Customization for Mobile Publisher

Once you’ve created and uploaded the .zip package, your custom layout will appear in the available color palette from Mobile Publisher.
Security
Security

How to implement security for mobile reporting?
Three possible options:

• Row-level security if you’re using SQL Server 2016
• Filter data with logged user and url parameters if you’re using prior version of SQL Server
• Row-level security for Analysis Services
Row-level security for SQL Server 2016

Works at data source level.
Map to the user the table(s) you want to filter. Create a security policy and a security predicate function based on this mapping. Dynamically filter logged user with the USER_NAME() function.
Security

Url parameter and logged user
Works at dataset level.
Create a dataset with parameter(s) and then filter out records based on the logged user.

```sql
SELECT
    Order, SalesAmount, Sales Territory
FROM  dbo.SalesOrder
WHERE @SalesTerritoryManager = USER_NAME()
```

Call the mobile report with a url including the filter parameters

http://<servername>/reports/mobilereports/Sales/SalesTerritory?datasetSales.@SalesTerritoryManager=<parameter-value>
Security

Row-level security for Analysis Services

Works at data source level.
Define an execution account in the Reporting Services Configuration Manager. Grant this account permissions on your Analysis Services instance.

Map users and roles to the data source you’ll be using for your mobile report.

For every role, set up the filters and limit the rows everyone is allowed to see.
Dealing with data
Built-in data

When you add an element to the dashboard, it is automatically shipped with some fictional data.

Remember to switch the dataset to your own data.
Data format

Some tips for working with the correct data format

Take into account that SQL Server Mobile Report Publisher has a standard behavior according to the data type format it is receiving.

Sometime is could be easier preformatting data at data source level, doing some conversion, aggregation, etc.
Date and time formats

A date is used to filter time intervals. To be identified as date/time column, the field must have one of the following formats:

05/01/2009
2009-05-01
05/01/2009 14:57:32.8
2009-05-01 14:57:32.8
2009-05-01T14:57:32.8375298-04:00
5/01/2008 14:57:32.80 -07:00
1 May 2008 2:57:32.8 PM
Fri, 15 May 2009 20:10:57 GMT

Mobile Report Publisher **does not** recognize date aggregation or functions (days, month, years, etc.)
Date must be passed at a granular level. Is the tool itself that makes aggregations internally.
Data for filtering

Filter are based on a single column. To prepare a filter field for use with a navigator element the filter key(s) must be merged into a single column.

Every number is treated as a digit and can’t be used for filtering. To use a number (for example a year value) in a selector, it must be converted to text before.

<table>
<thead>
<tr>
<th>Date</th>
<th>Category</th>
<th>FilterKey</th>
<th>Metric1</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item A1</td>
<td>14.133,00</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item A2</td>
<td>5.653,20</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item A3</td>
<td>2.826,60</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item A4</td>
<td>8.479,80</td>
</tr>
<tr>
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<td>Category A</td>
<td>Item B1</td>
<td>9.893,10</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item B2</td>
<td>14.133,00</td>
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<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item B3</td>
<td>5.653,20</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item B4</td>
<td>2.826,60</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item C1</td>
<td>8.479,80</td>
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<td>Item C2</td>
<td>9.893,10</td>
</tr>
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<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item C3</td>
<td>14.133,00</td>
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<tr>
<td>01-01-2012 00:00:00</td>
<td>Category A</td>
<td>Item C4</td>
<td>5.653,20</td>
</tr>
<tr>
<td>01-01-2012 00:00:00</td>
<td>Category B</td>
<td>Item A1</td>
<td>11.306,40</td>
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<tr>
<td>01-01-2012 00:00:00</td>
<td>Category B</td>
<td>Item A2</td>
<td>4.522,56</td>
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<td>2.261,28</td>
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<td>01-01-2012 00:00:00</td>
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<td>Item A4</td>
<td>6.783,84</td>
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<tr>
<td>01-01-2012 00:00:00</td>
<td>Category B</td>
<td>Item B1</td>
<td>3.014,40</td>
</tr>
</tbody>
</table>
Questions?

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Please fill in the evaluations

- [x] Excellent
- [ ] Good
- [ ] Satisfactory
- [ ] Poor
Thanks!