Qubix

Prepare and deploy Maps Views in Oracle BI

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Senior Consultant

20. hroug godišnja konferencija

Rovinj, 14.10.2015

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Leading Innovation in Business Analytics

About Qubix

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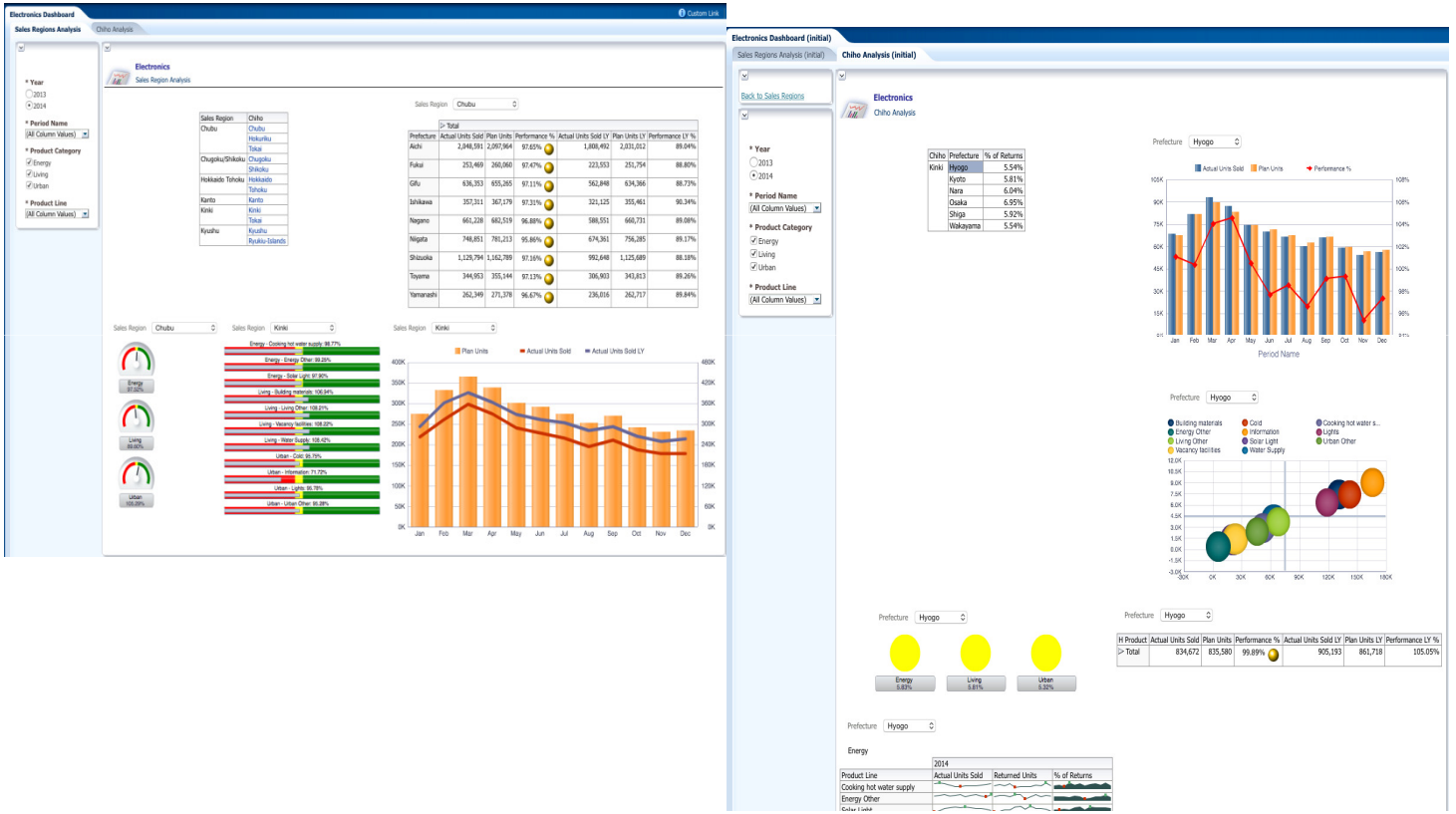
About me

- 20+ Years in IT
- 10 years working for Oracle, 4 years CIO
- MSc. in Economy, BSc. in IT
- Senior Consultant for Business Intelligence solutions
- Major work area today is Business Intelligence, currently investigating BI Cloud Services, and focusing in Data Science and Machine Learning

Qubix @ HROUG 2015

Šta	Tko	Gdje	Kada
Korištenje agregata i kombiniranje izvora podataka u Oracle BI	Žiga Vaupot	Dv 5 Apartmani	srijeda, 14. listopad 2015., 09:00
Priprema i implementacija Karte pogleda u Oracle BI	Žiga Vaupot	Dv 5 Apartmani	srijeda, 14. listopad 2015., 10:00
Planiranje i budžetiranje Cloud usluge!	Andrew Mason	Dv 4 Mali klub	srijeda, 14. listopad 2015., 15:00
Sklad Oracle Cloud za EPM i BI su: Baxters recepti za uspjeh	Andrew Mason	Dv 5 Apartmani	četvrtak, 15. listopad 2015., 12:30

Starting point: Dashboard



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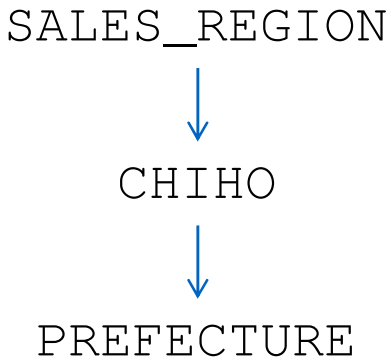
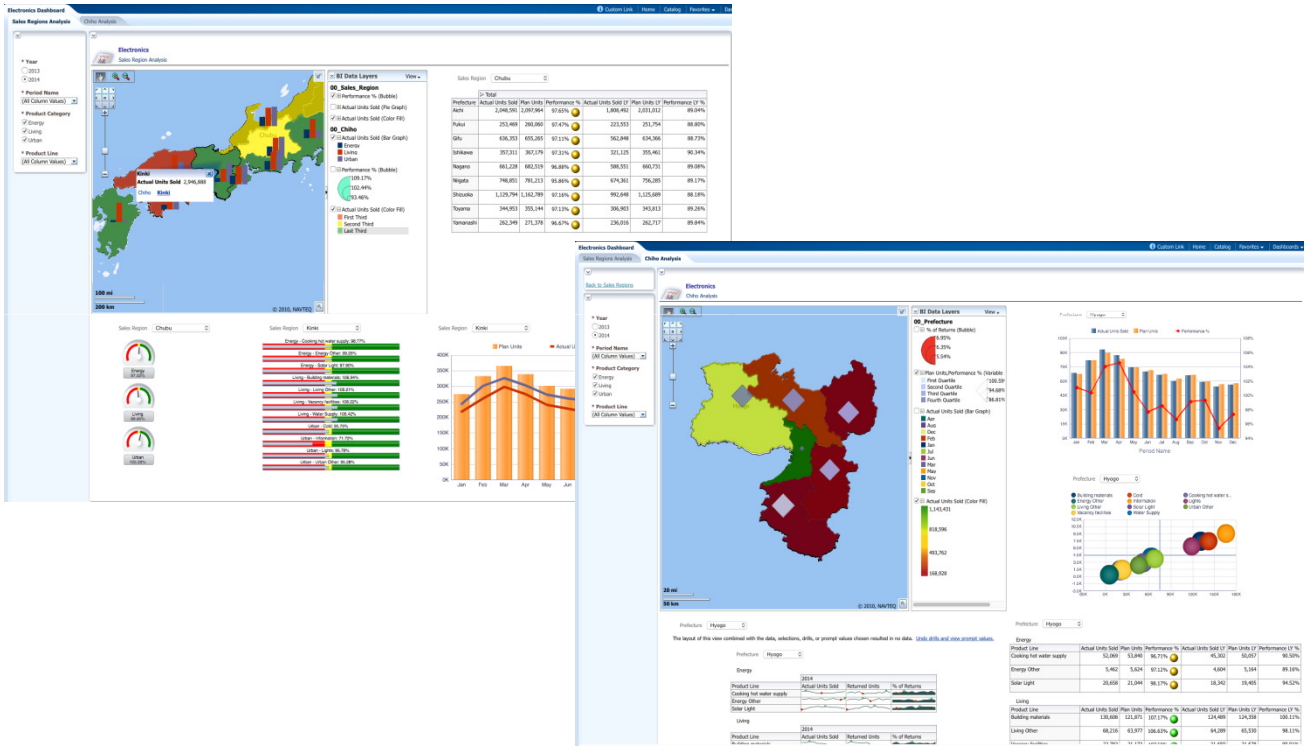
Starting point: MAP_PREFECTURE table

	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	ADMINID	NUMBER(38,0)	Yes	(null)	1	(null)
2	COUNTRY	VARCHAR2(3 BYTE)	Yes	(null)	2	(null)
3	CHIHO	VARCHAR2(25 BYTE)	Yes	(null)	3	(null)
4	PREFECTURE	VARCHAR2(25 BYTE)	Yes	(null)	4	(null)
5	SALES_REGION	VARCHAR2(25 BYTE)	Yes	(null)	5	(null)
6	POPULATION	NUMBER(38,0)	Yes	(null)	6	(null)
7	GEOMETRY	SDO_GEOMETRY	Yes	(null)	7	(null)

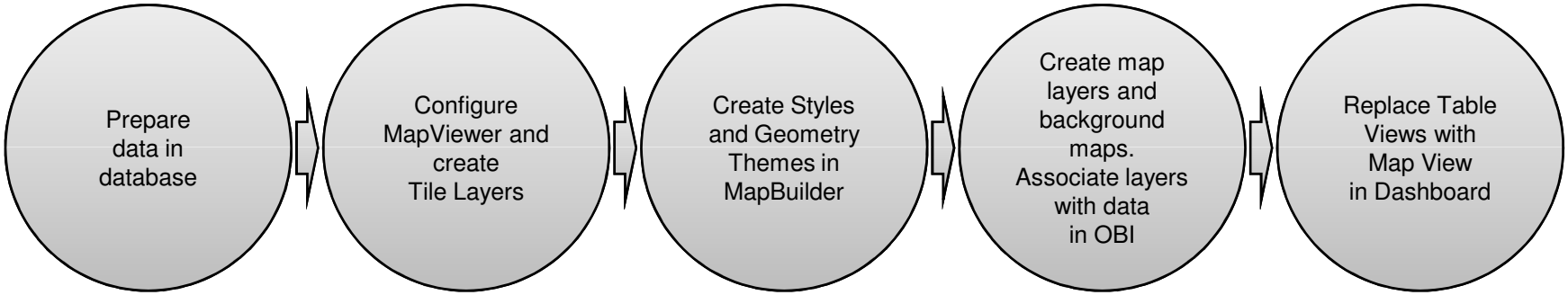
	ADMINID	COUNTRY	CHIHO	PREFECTURE	SALES_REGION	POPULATION	GEOMETRY
1	392030200	JPN	Kanto	Tochigi	Kanto	2087003	[MDSYS.SDO_GEOMETRY]
2	392030300	JPN	Kanto	Gunma	Kanto	2076340	[MDSYS.SDO_GEOMETRY]
3	392050200	JPN	Chubu	Nagano	Chubu	2194556	[MDSYS.SDO_GEOMETRY]
4	392040200	JPN	Hokuriku	Toyama	Chubu	1138856	[MDSYS.SDO_GEOMETRY]
5	392030100	JPN	Kanto	Ibaraki	Kanto	3096359	[MDSYS.SDO_GEOMETRY]
6	392050300	JPN	Chubu	Gifu	Chubu	2143327	[MDSYS.SDO_GEOMETRY]
7	392040400	JPN	Hokuriku	Fukui	Chubu	831069	[MDSYS.SDO_GEOMETRY]
8	392030400	JPN	Kanto	Saitama	Kanto	6867677	[MDSYS.SDO_GEOMETRY]
9	392030500	JPN	Kanto	Chiba	Kanto	6192786	[MDSYS.SDO_GEOMETRY]
10	392050100	JPN	Chubu	Yamanashi	Chubu	897671	[MDSYS.SDO_GEOMETRY]



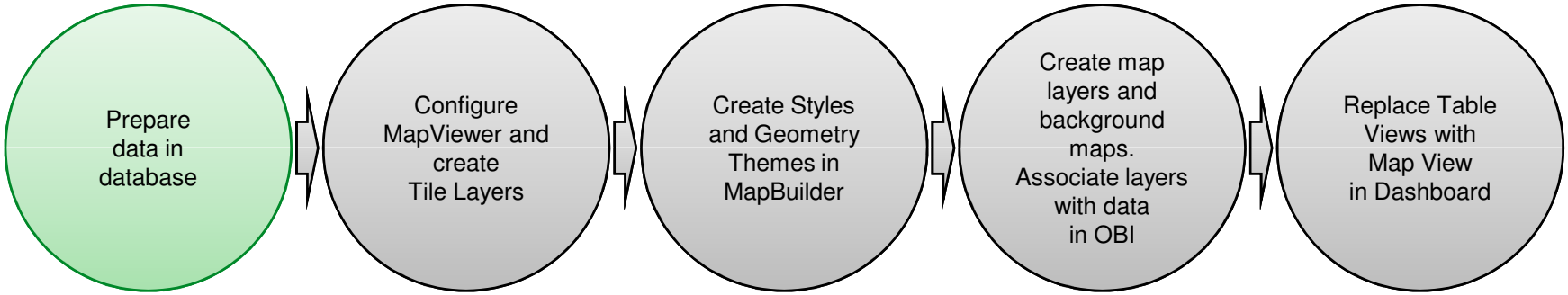
What we want to achieve?
Dashboard with interactive map analysis



Process



Process



MAP_PREFECTURES table

	ADMINID	COUNTRY	CHIHO	PREFECTURE	SALES_REGION	POPULATION	GEOMETRY
1	392030200	JPN	Kanto	Tochigi	Kanto	2087003	[MDSYS.SDO_GEOMETRY]
2	392030300	JPN	Kanto	Gunma	Kanto	2076340	[MDSYS.SDO_GEOMETRY]
3	392050200	JPN	Chubu	Nagano	Chubu	2194556	[MDSYS.SDO_GEOMETRY]
4	392040200	JPN	Hokuriku	Toyama	Chubu	1138856	[MDSYS.SDO_GEOMETRY]
5	392030100	JPN	Kanto	Ibaraki	Kanto	3096359	[MDSYS.SDO_GEOMETRY]
6	392050300	JPN	Chubu	Gifu	Chubu	2143327	[MDSYS.SDO_GEOMETRY]
7	392040400	JPN	Hokuriku	Fukui	Chubu	831069	[MDSYS.SDO_GEOMETRY]
8	392030400	JPN	Kanto	Saitama	Kanto	6867677	[MDSYS.SDO_GEOMETRY]
9	392030500	JPN	Kanto	Chiba	Kanto	6192786	[MDSYS.SDO_GEOMETRY]
10	392050100	JPN	Chubu	Yamanashi	Chubu	897671	[MDSYS.SDO_GEOMETRY]

SDO_GEOMETRY data type

SDO_TYPE (polygon)

Spatial Reference (Coordinate) system ID (SRID)

SDO_POINT_TYPE

Starting offset = 1
Element type = 1003; simple element
Interpretation = 1, simple polygon whose vertices are connected by straight line segments.

```
MDSYS.SDO_GEOMETRY(2003, 8307, NULL, MDSYS.SDO_ELEM_INFO_ARRAY(1,1003,1),
MDSYS.SDO_ORDINATE_ARRAY(139.964492797852,37.1502304077148,139.953704833984,37.1512184143066,
…, 139.964492797852,37.1502304077148))
```

Array of pairs (x,y) that stores the coordinate values that make up the boundary of a spatial object

Enable MAP_PREFECTURES to be used in spatial analysis

- Two steps:
  1. Register MAP_PREFECTURES table with USER_SDO_GEOM_METADATA view
  2. Create SPATIAL INDEX on MAP_PREFECTURES.GEOMETRY

Register table with USER_SDO_GEOM_METADATA view

```
select * from USER_SDO_GEOM_METADATA where table_name = 'MAP_PREFECTURES';

no rows selected
```

```
insert into USER_SDO_GEOM_METADATA(TABLE_NAME, COLUMN_NAME, DIMINFO, SRID)
VALUES('MAP_PREFECTURES', 'GEOMETRY',
          MDSYS.SDO_DIM_ARRAY(MDSYS.SDO_DIM_ELEMENT('X', -180, 180, 0.05),
          MDSYS.SDO_DIM_ELEMENT('Y', -90, 90, 0.05)), 8307);
commit;
```

```
select * from USER_SDO_GEOM_METADATA where table_name = 'MAP_PREFECTURES';
```

	TABLE_NAME	COLUMN_NAME	DIMINFO	SRID
1	MAP_PREFECTURES	GEOMETRY	MDSYS.SDO_DIM_ARRAY([MDSYS.SDO_DIM_ELEMENT],[MDSYS.SDO_DIM_ELEMENT])	8307

Create SPATIAL index

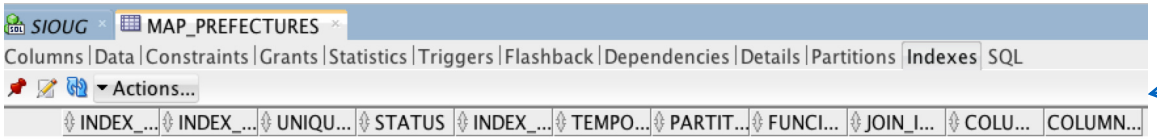
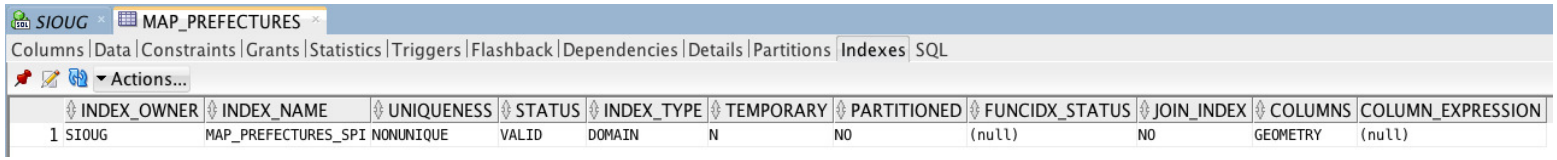


table MAP_PREFECTURES has no indexes

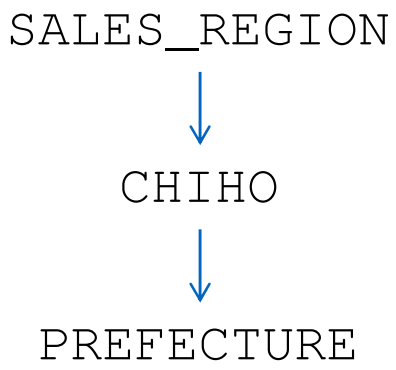
```
create index MAP_PREFECTURES_SPI on MAP_PREFECTURES(GEOMETRY)
indextype is mdsys.spatial_index;

index MAP_PREFECTURES_SPI created.
```



	INDEX_OWNER	INDEX_NAME	UNIQUENESS	STATUS	INDEX_TYPE	TEMPORARY	PARTITIONED	FUNCIDX_STATUS	JOIN_INDEX	COLUMNS	COLUMN_EXPRESSION
1	SIOUG	MAP_PREFECTURES_SPI	NONUNIQUE	VALID	DOMAIN	N	NO	(null)	NO	GEOMETRY	(null)

MAP_PREFECTURES is now ready for spatial analysis, but …

- … remember the starting point.



- But (another BUT) there is nothing like MAP_CHIHO and MAP_SALES_REGION table in our database schema!

Luckilly, we have SDO

- For example, you can “aggregate” (topological union) polygons

```
SDO_AGGR_UNION(
     AggregateGeometry SDOAGGRTYPE
) RETURN SDO_GEOMETRY;
```

So, we can now create a new table with spatial data – MAP_CHIHO

```
create table MAP_CHIHOS as (
          select CHIHO, SALES_REGION,
          SDO_AGGR_UNION(MDSYS.SDOAGGRTYPE(geometry, 0.05)) GEOMETRY
from MAP_PREFECTURES
group by CHIHO, SALES_REGION);
```

	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	CHIHO	VARCHAR2(25 BYTE)	Yes	(null)	1	(null)
2	SALES_REGION	VARCHAR2(25 BYTE)	Yes	(null)	2	(null)
3	GEOMETRY	SDO_GEOMETRY	Yes	(null)	3	(null)

	CHIHO	SALES_REGION	GEOMETRY
1	Chubu	Chubu	[MDSYS.SDO_GEOMETRY]
2	Kanto	Kanto	[MDSYS.SDO_GEOMETRY]
3	Kinki	Kinki	[MDSYS.SDO_GEOMETRY]
4	Tokai	Chubu	[MDSYS.SDO_GEOMETRY]
5	Kyushu	Kyushu	[MDSYS.SDO_GEOMETRY]
6	Tohoku	Hokkaido Tohoku	[MDSYS.SDO_GEOMETRY]
7	Chugoku	Chugoku/Shikoku	[MDSYS.SDO_GEOMETRY]
8	Shikoku	Chugoku/Shikoku	[MDSYS.SDO_GEOMETRY]
9	Hokkaido	Hokkaido Tohoku	[MDSYS.SDO_GEOMETRY]
10	Hokuriku	Chubu	[MDSYS.SDO_GEOMETRY]
11	Ryukiu-Islands	Kyushu	[MDSYS.SDO_GEOMETRY]

And now?

- Well, repeat the two steps:
  - Register MAP_CHIHO with USER_SDO_GEOM_METADATA

```
insert into USER_SDO_GEOM_METADATA(TABLE_NAME, COLUMN_NAME, DIMINFO, SRID)
   VALUES('MAP_CHIHOS', 'GEOMETRY',
          MDSYS.SDO_DIM_ARRAY(MDSYS.SDO_DIM_ELEMENT('X', -180, 180, 0.05),
          MDSYS.SDO_DIM_ELEMENT('Y', -90, 90, 0.05)), 8307);
commit;
```

  - Create a new spatial index for MAP_CHIHO

```
create index MAP_CHIHOS_SPI on MAP_CHIHOS(GEOMETRY)
indextype is mdsys.spatial_index;
```

Let's create also MAP_SALES_REGIONS and enable it for spatial analysis

- Create MAP_SALES_REGIONS

```
create table MAP_SALES_REGIONS as (
   select SALES_REGION,
          SDO_AGGR_UNION(MDSYS.SDOAGGRTYPE(geometry, 0.05)) GEOMETRY
   from MAP_CHIHOS
   group by SALES_REGION);
```

- Register MAP_SALES_REGIONS with USER_SDO_GEOM_METADATA

```
insert into USER_SDO_GEOM_METADATA(TABLE_NAME, COLUMN_NAME, DIMINFO, SRID)
   VALUES('MAP_SALES_REGIONS', 'GEOMETRY',
          MDSYS.SDO_DIM_ARRAY(MDSYS.SDO_DIM_ELEMENT('X', -180, 180, 0.05),
          MDSYS.SDO_DIM_ELEMENT('Y', -90, 90, 0.05)), 8307);
commit;
```

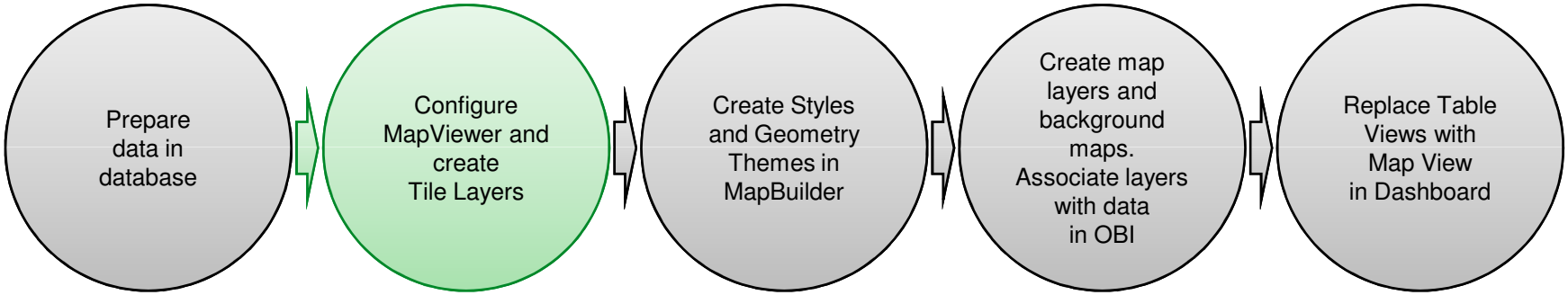
- Create spatial index

```
create index MAP_SALES_REGIONS_SPI on MAP_SALES_REGIONS(GEOMETRY)
indextype is mdsys.spatial_index;
```

This is it. We have now spatial tables ready to be used.

- 3 tables:
  - MAP_PREFECTURES,
  - MAP_CHIHOS,
  - MAP_SALES_REGIONS
- 3 records in USER_SDO_GEOM_METADATA table, one for each table
- 3 spatial indexes, one on each table.

Process



What is MapViewer?

- Oracle Fusion Middleware MapViewer enables developers to incorporate highly interactive maps and spatial analysis into business applications. A component of Oracle Fusion Middleware, it lets you combine application content with maps and data from a variety of web services and data formats. It is also fully integrated with Oracle Spatial and Graph. In addition, it is included in Oracle products such as Oracle Business Intelligence.

Why do we need MapViewer?

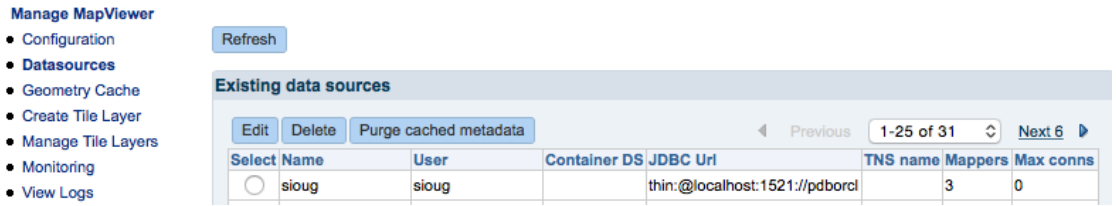
- Configure data sources for spatial data
- Create Tile Layer based on Oracle Map, Google Map or similar

Configure data sources

- Specify JDBC connection in mapViewerConfig.xml:

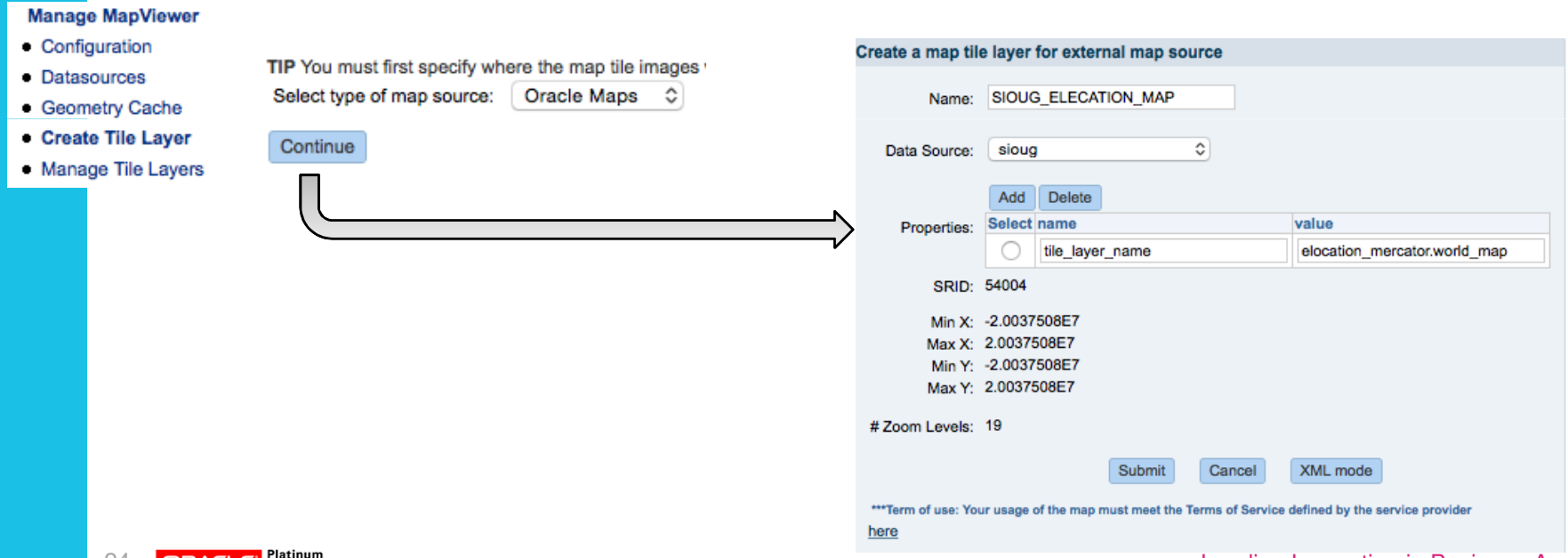
```
<map_data_source name="sioug"
                 jdbc_host="localhost"
                 jdbc_sid="//pdborcl"
                 jdbc_port="1521"
                 jdbc_user="sioug"
                 jdbc_password="!sioug"
                 jdbc_mode="thin"
                 number_of_mappers="3"
                 allow_jdbc_theme_based_foi="true"
                 editable="false"
   />
```

- Save & Restart and then check datasources

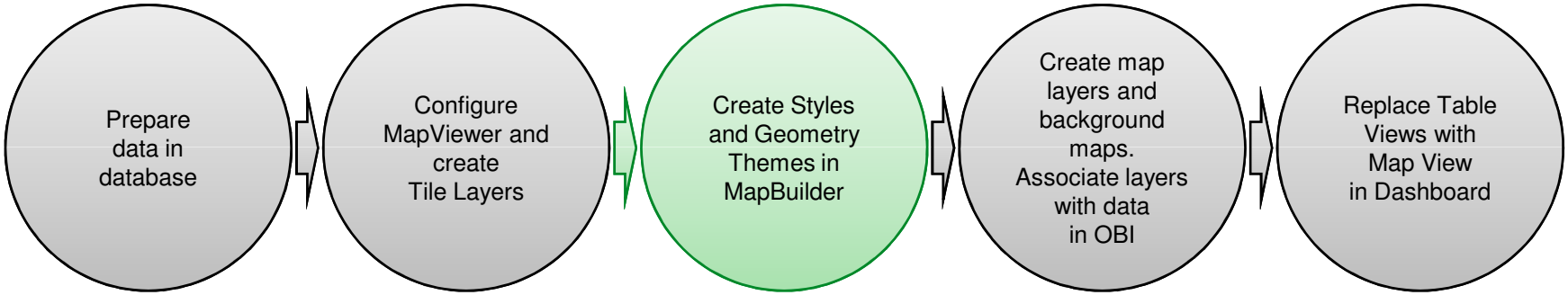


Create Tile Layer

- Tile layer could be understood as a background map, onto which all other layers will be added



Process



Most of the “map” stuff happen in Map Builder*

- Oracle Map Builder is a standalone application that lets you create and manage the mapping metadata (about styles, themes, and base maps) that is stored in the database.
- Whenever possible, you should use Oracle Map Builder instead of directly modifying MapViewer metadata views to create, modify, and delete information about styles, themes, and maps.

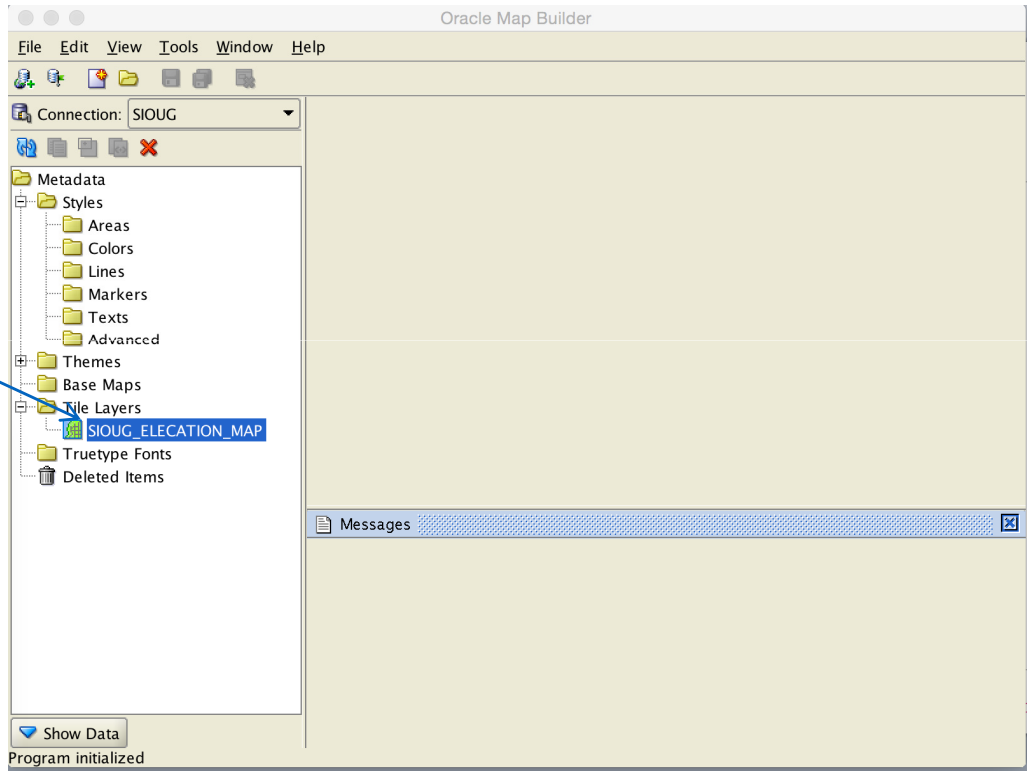
*Oracle® Fusion Middleware User's Guide for Oracle MapViewer

Map Builder UI

Tile Layer we've just created in MapViewer.

Later, this will be called Base or Background map.

Be aware that the terminology used in MapViewer/Map Builder differs from the one used in Oracle Business Intelligence (don't ask why).

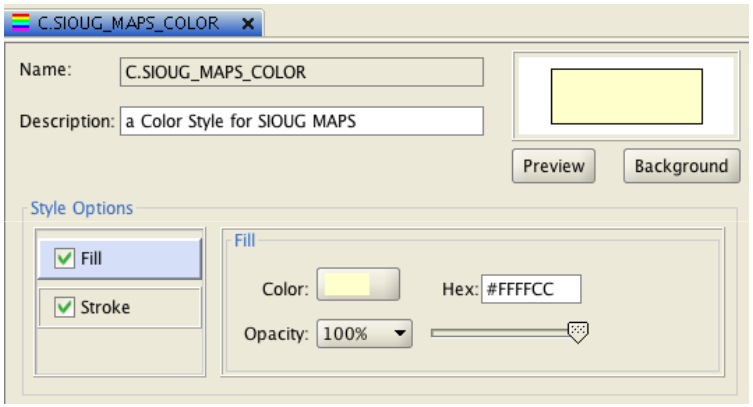


Tasks in Map Builder

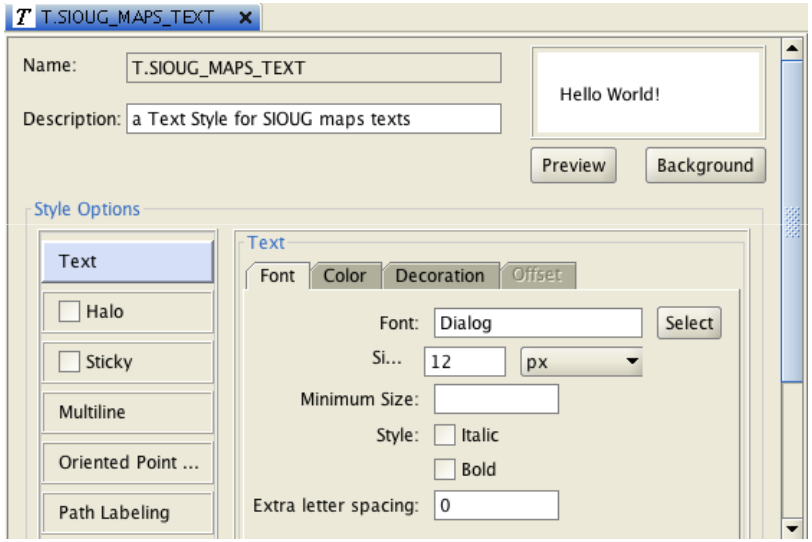
- Create Styles for Colors, Texts, Areas, … and other spatial objects used in maps
- Create Geometry Themes, which are called call these Layers (☺) in OBI people

Create Styles

- Color



- Text



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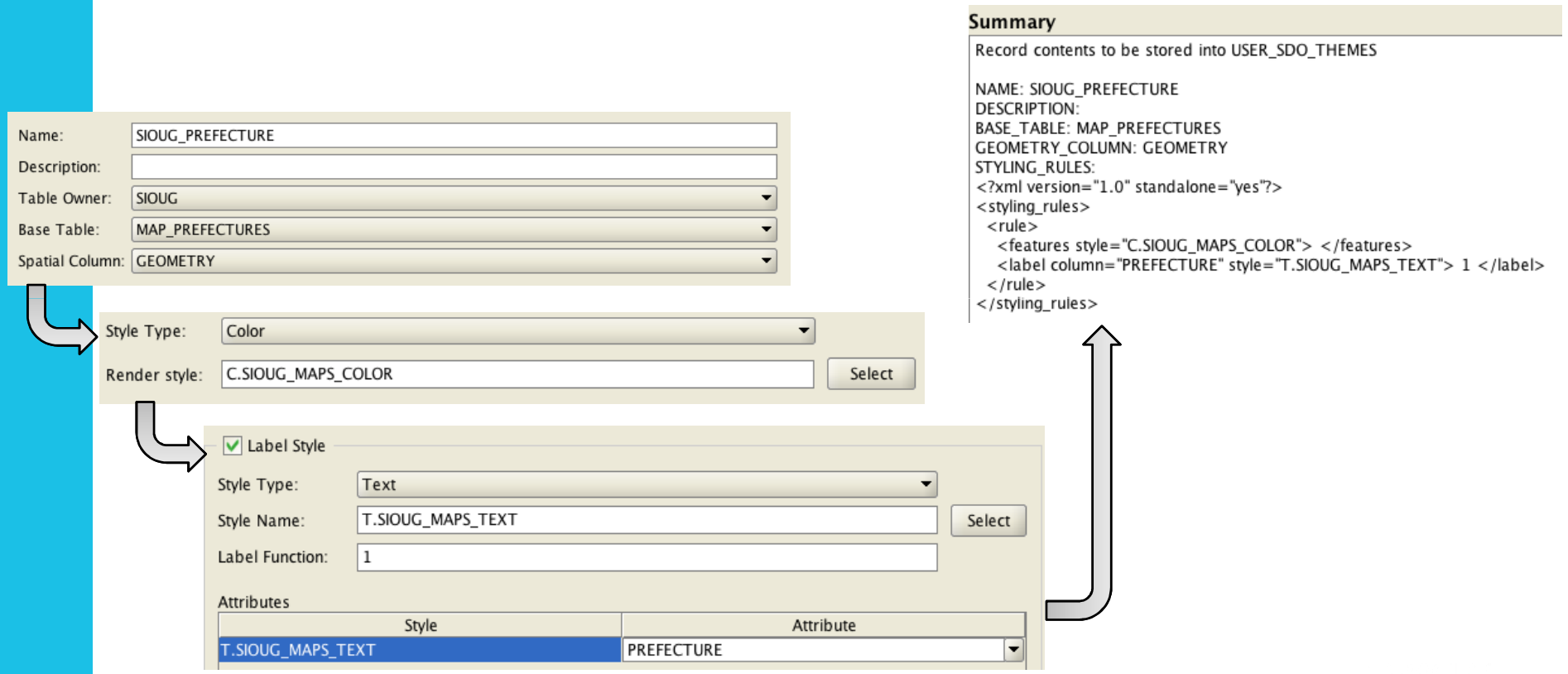
Create Geometry Themes

- Create Geometry Theme For each MAP_xxx table in our database schema:
  - MAP_SALES_REGION
  - MAP_CHIHO
  - MAP_PREFECTURE
- Geometry Theme Wizard takes you through 4 steps in defining a new Geometry Theme

Geometry Theme Wizard steps



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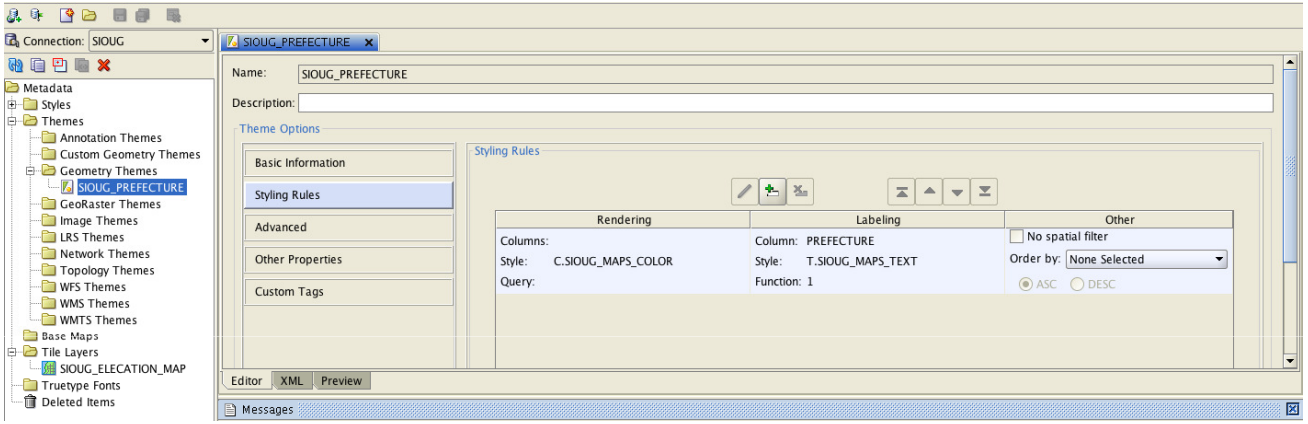
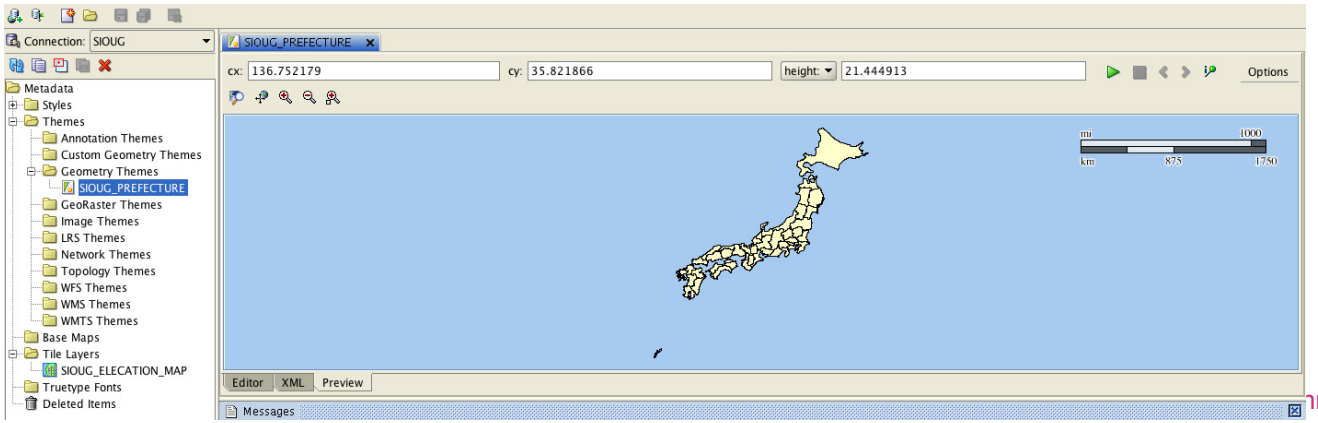
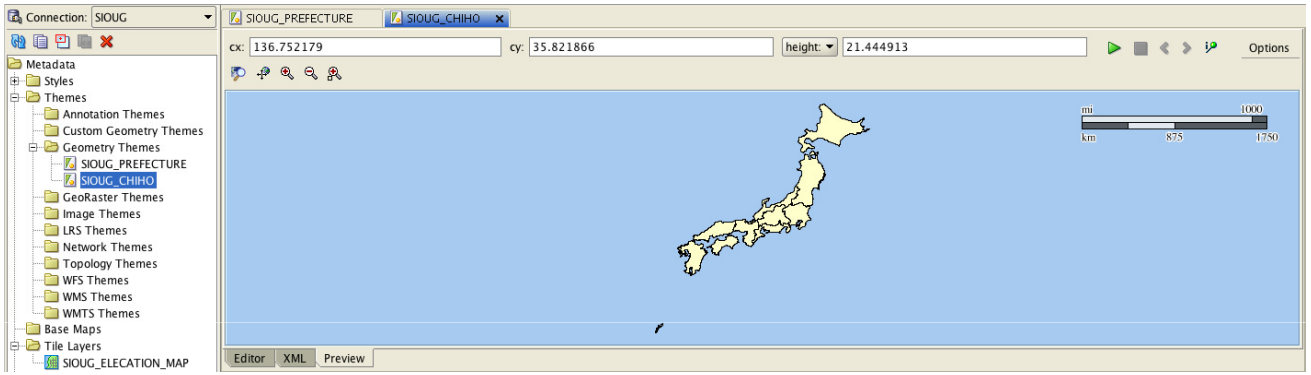
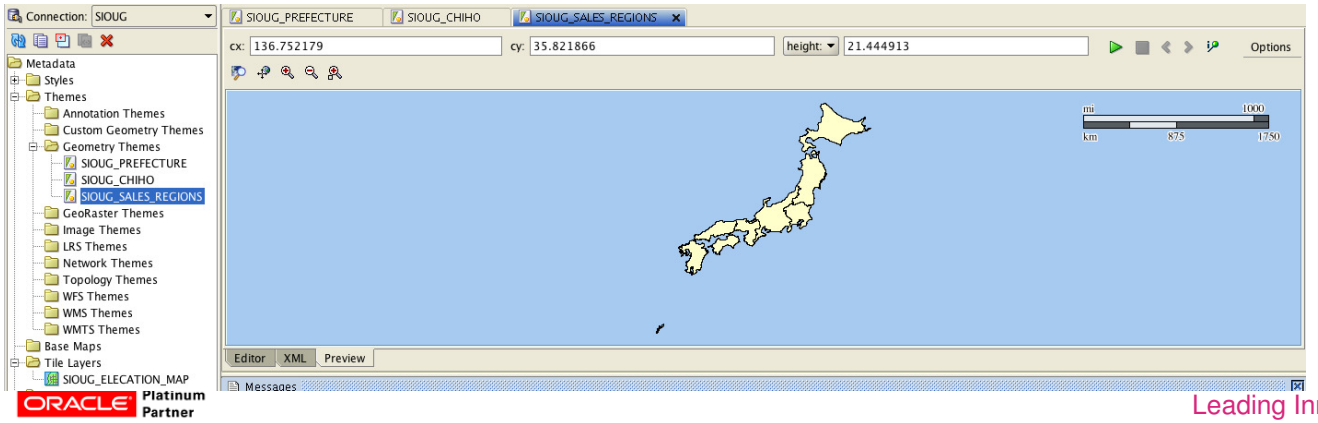
More properties and Preview



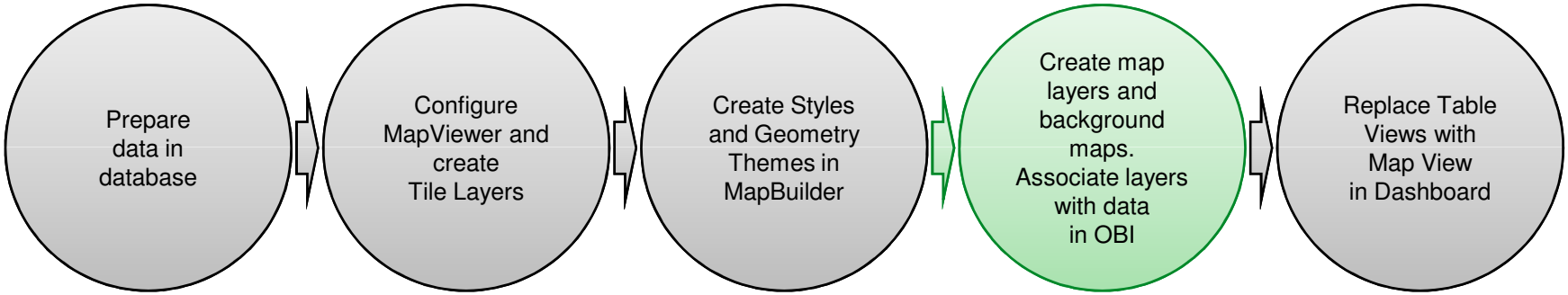


Repeat Geometry Theme creation steps for the two remaining layers

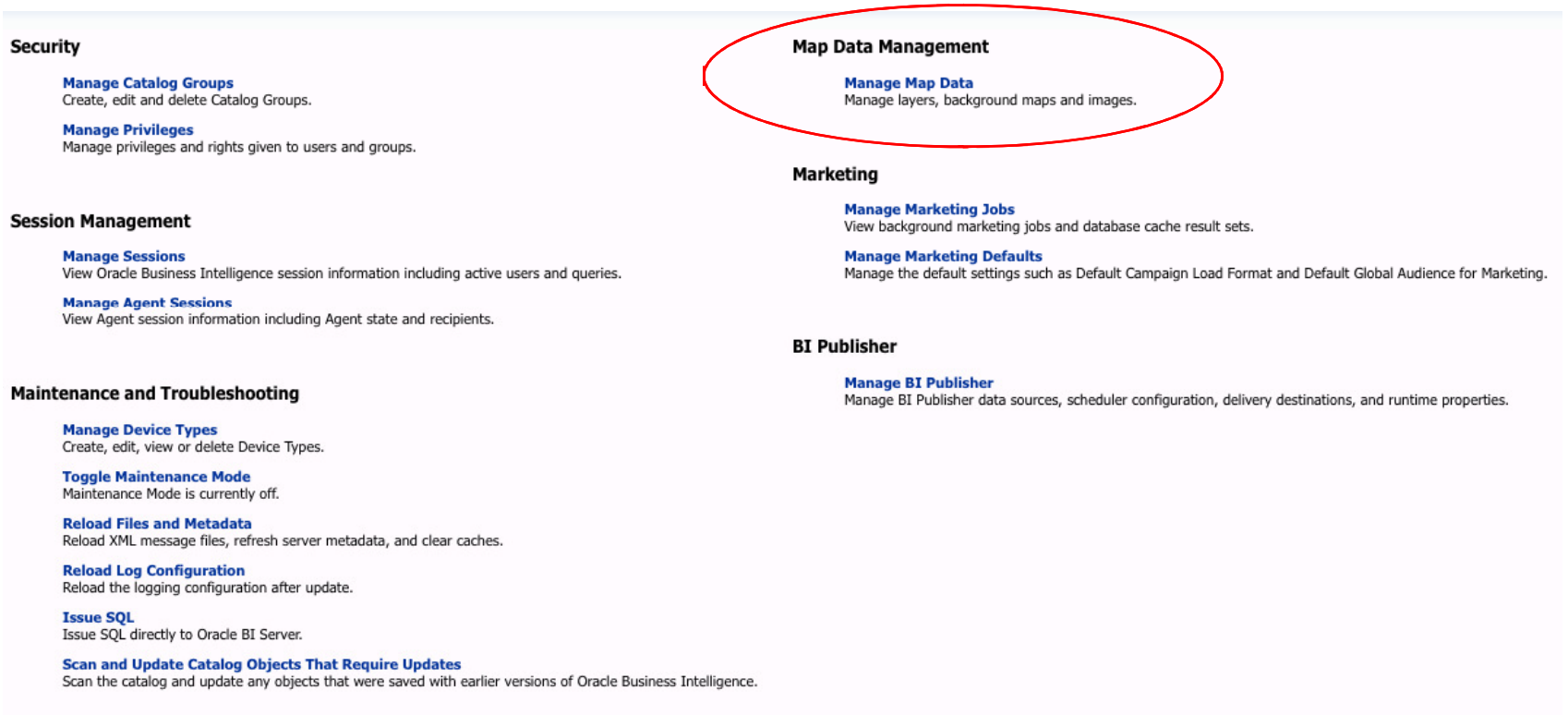




Process



Let's bring it all together now!



Security

Manage Catalog Groups
Create, edit and delete Catalog Groups.

Manage Privileges
Manage privileges and rights given to users and groups.

Session Management

Manage Sessions
View Oracle Business Intelligence session information including active users and queries.

Manage Agent Sessions
View Agent session information including Agent state and recipients.

Maintenance and Troubleshooting

Manage Device Types
Create, edit, view or delete Device Types.

Toggle Maintenance Mode
Maintenance Mode is currently off.

Reload Files and Metadata
Reload XML message files, refresh server metadata, and clear caches.

Reload Log Configuration
Reload the logging configuration after update.

Issue SQL
Issue SQL directly to Oracle BI Server.

Scan and Update Catalog Objects That Require Updates
Scan the catalog and update any objects that were saved with earlier versions of Oracle Business Intelligence.

Map Data Management

Manage Map Data
Manage layers, background maps and images.

Marketing

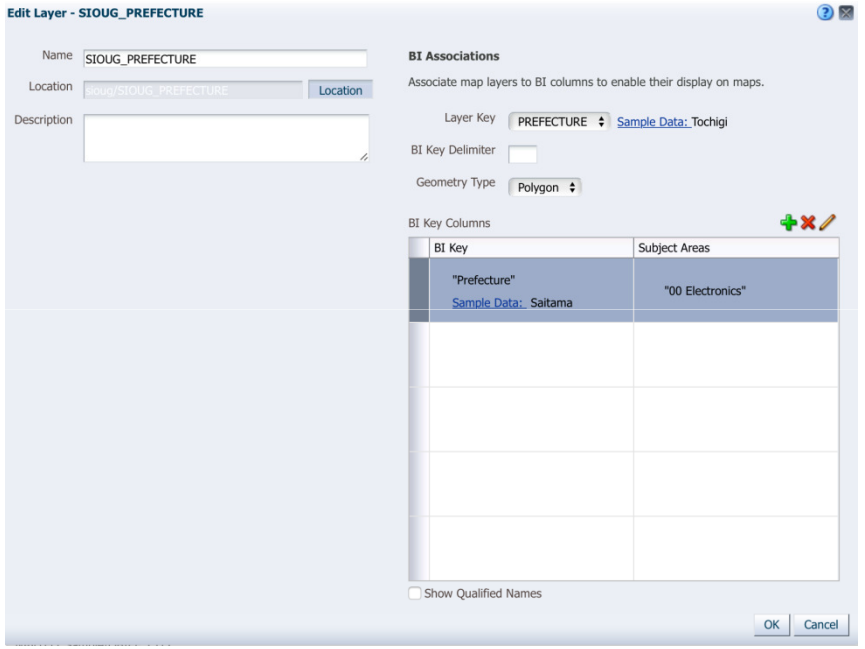
Manage Marketing Jobs
View background marketing jobs and database cache result sets.

Manage Marketing Defaults
Manage the default settings such as Default Campaign Load Format and Default Global Audience for Marketing.

BI Publisher

Manage BI Publisher
Manage BI Publisher data sources, scheduler configuration, delivery destinations, and runtime properties.

Import Layers first, then link Layer key with BI Key Column

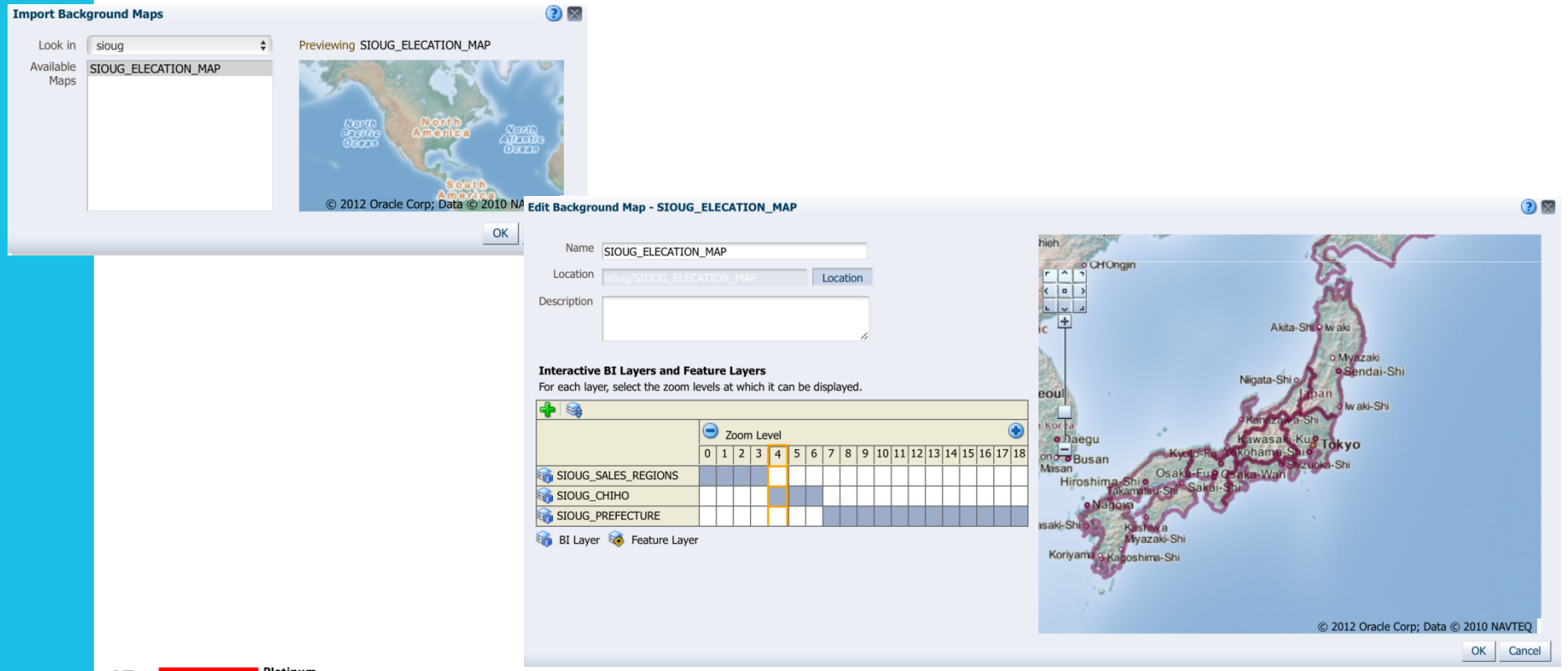


Import layer for all three Layers* you've created with Map Builder

SIOUG_CHIHO		sioug/SIOUG_CHIHO
SIOUG_PREFECTURE		sioug/SIOUG_PREFECTURE
SIOUG_SALES_REGIONS		sioug/SIOUG_SALES_REGIONS

*In Map Builder "Layer" is called "Geometry Theme"

Import Background Map and associate imported Layers with it



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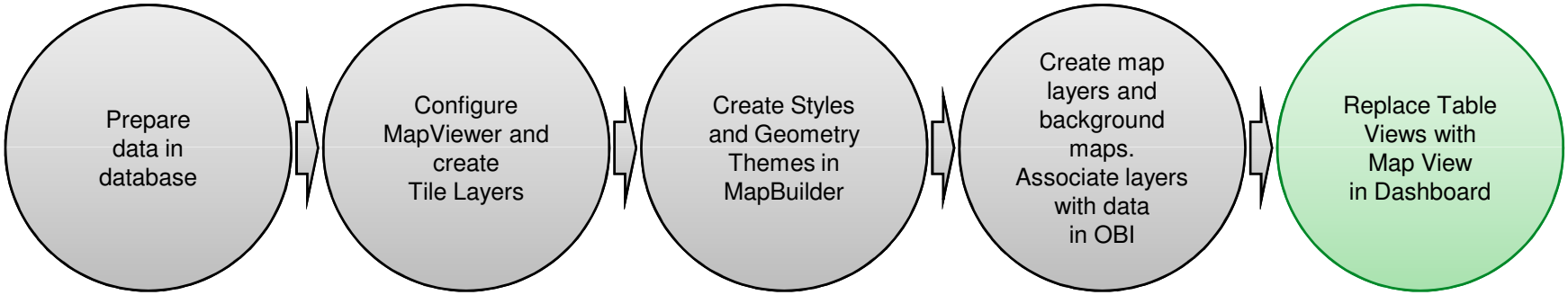
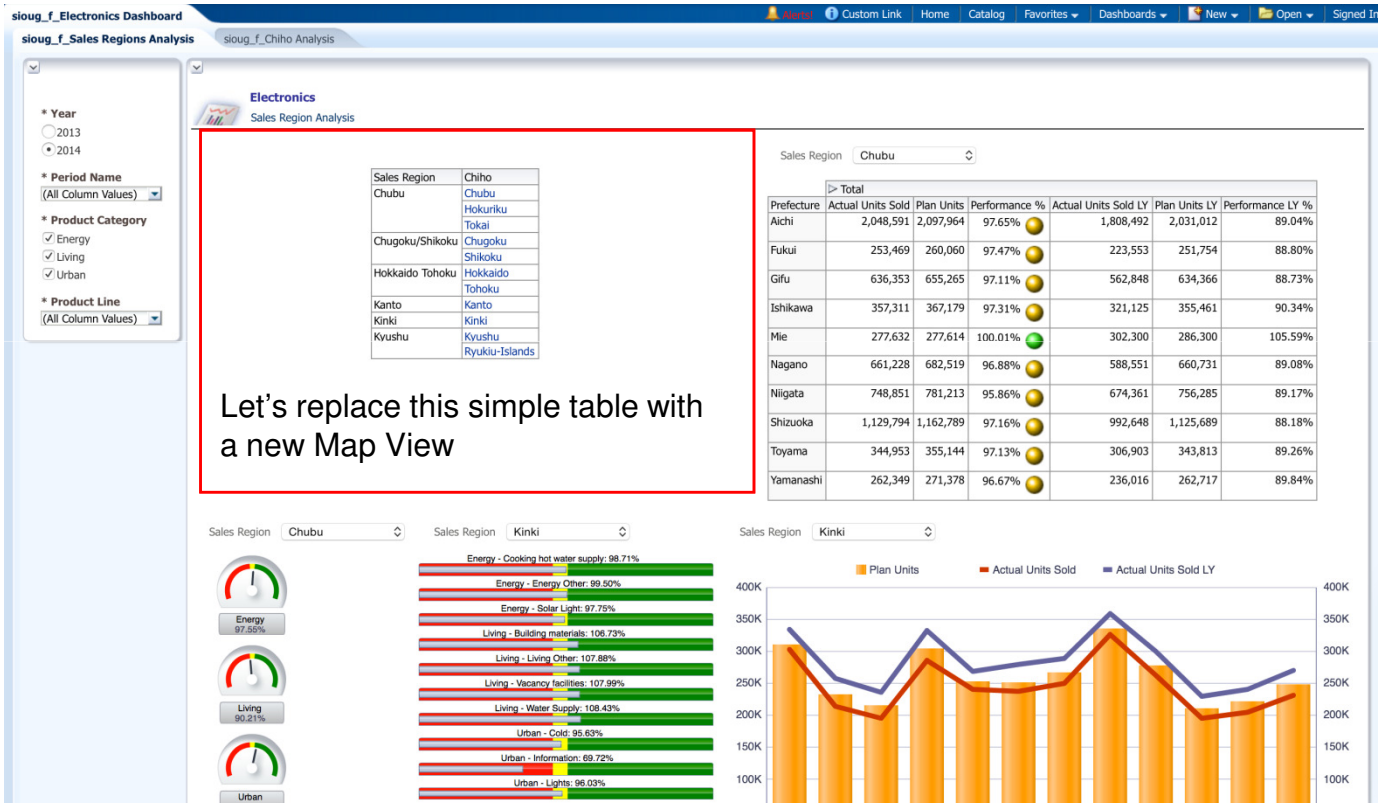
Process



We are almost there.



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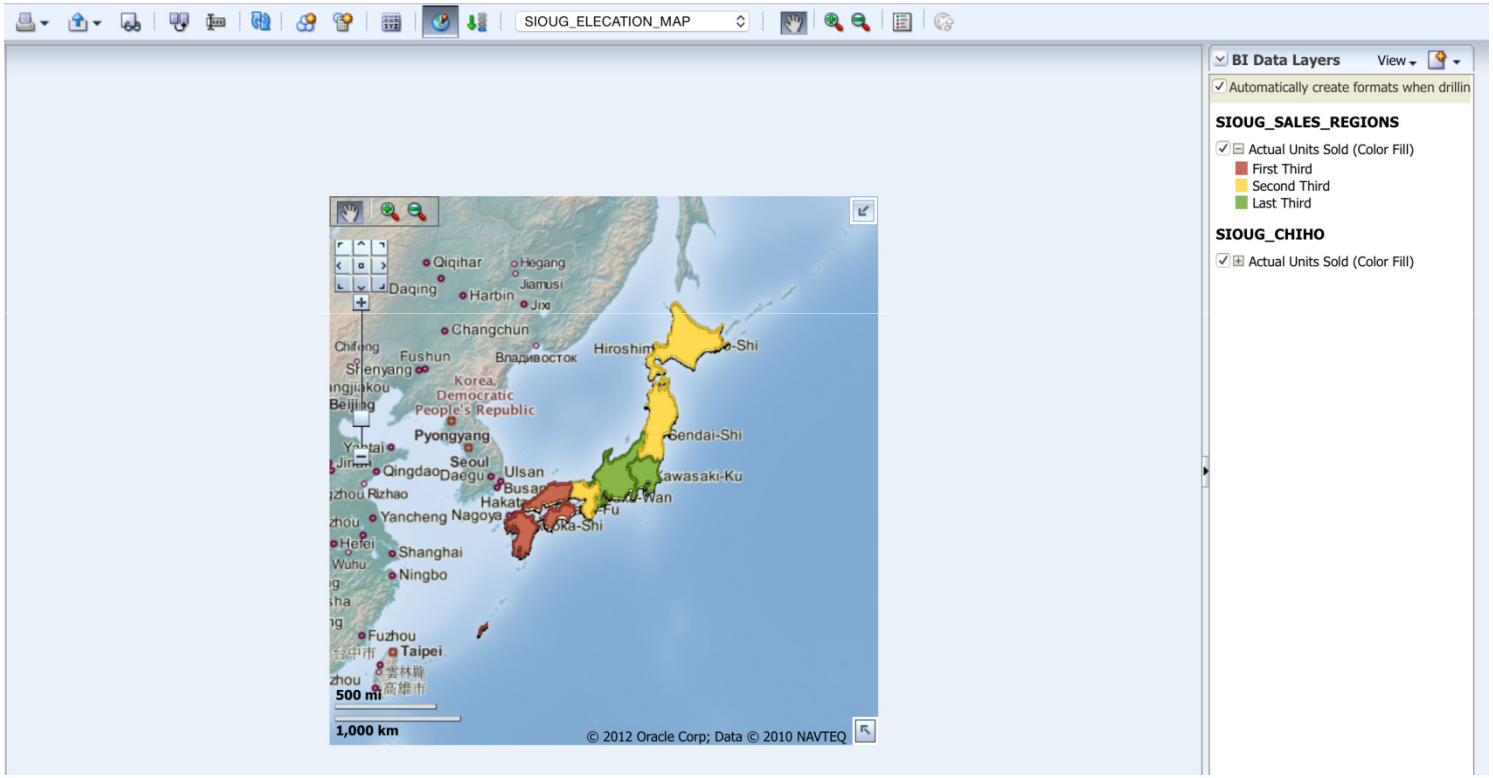
Create a new Map View



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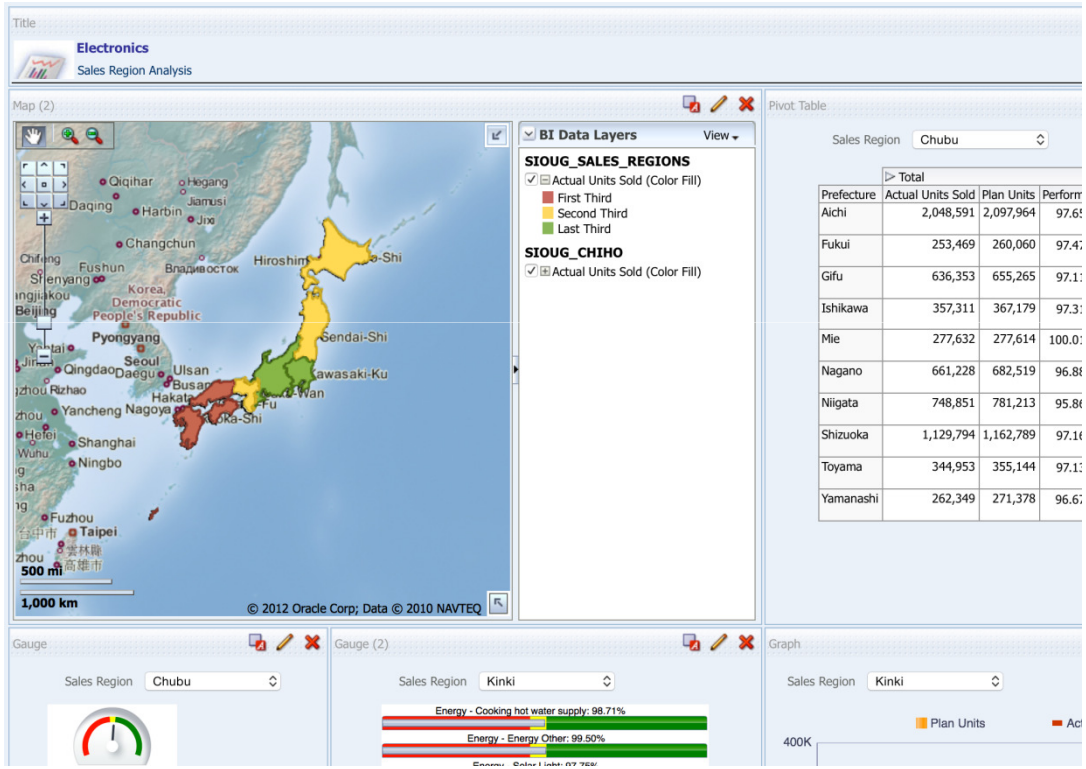
Add it to the existing compound view instead of simple table



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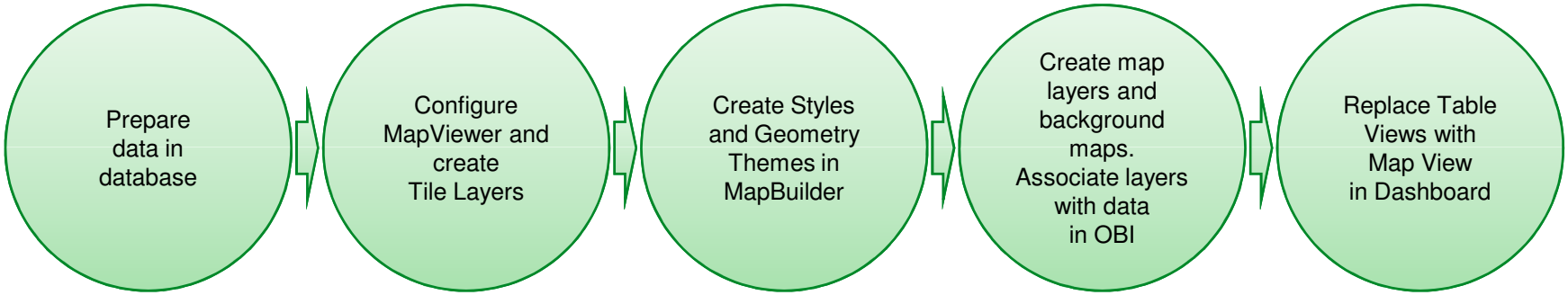
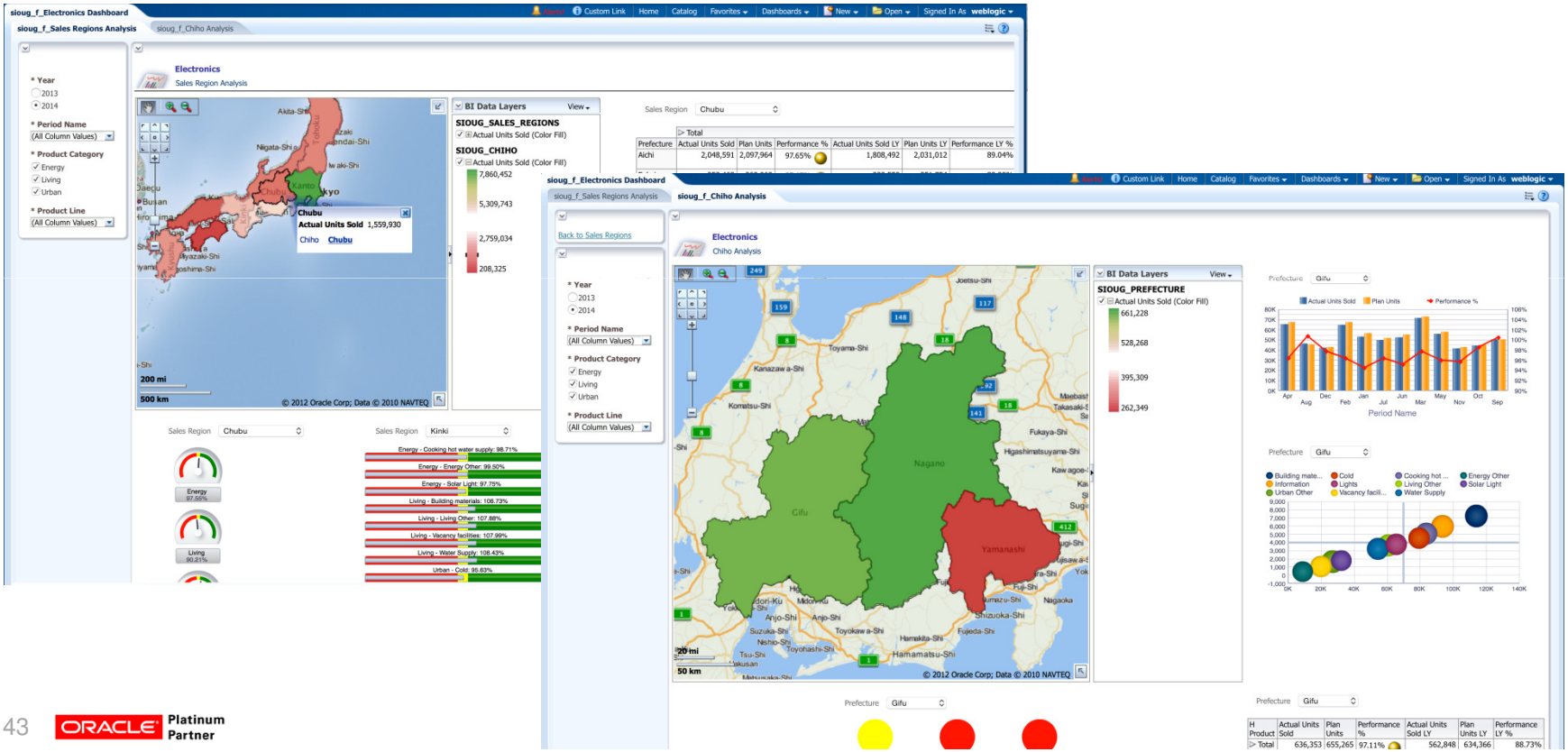
Process



We have nice working dashboard with interactive spatial analysis included



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That's all Folks!

Qubix after SIOUG 2015/HROUG 2015

What	Where	When
Oracle Planning and Budgeting Cloud Service FREE TRAINING	Zagreb	12. – 13. studeni 2015
More information: http://www2.qubix.com/training/cee/zagreb/pbcs		
Oracle Planning and Budgeting Cloud Service FREE TRAINING	Ljubljana	19. – 20. studeni 2015
More information: http://www2.qubix.com/training/cee/ljubljana/pbcs		

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