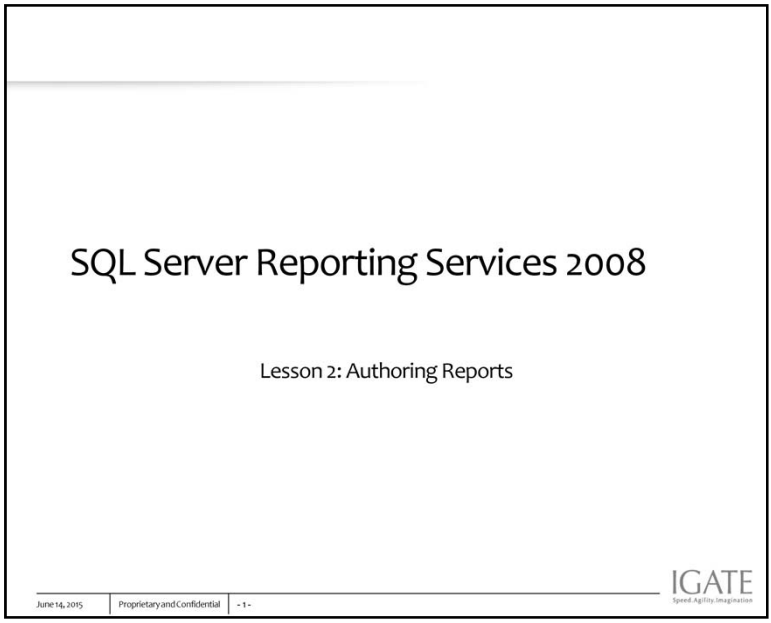
SQL Server Reporting Services 2008
Lesson 2: Authoring Reports
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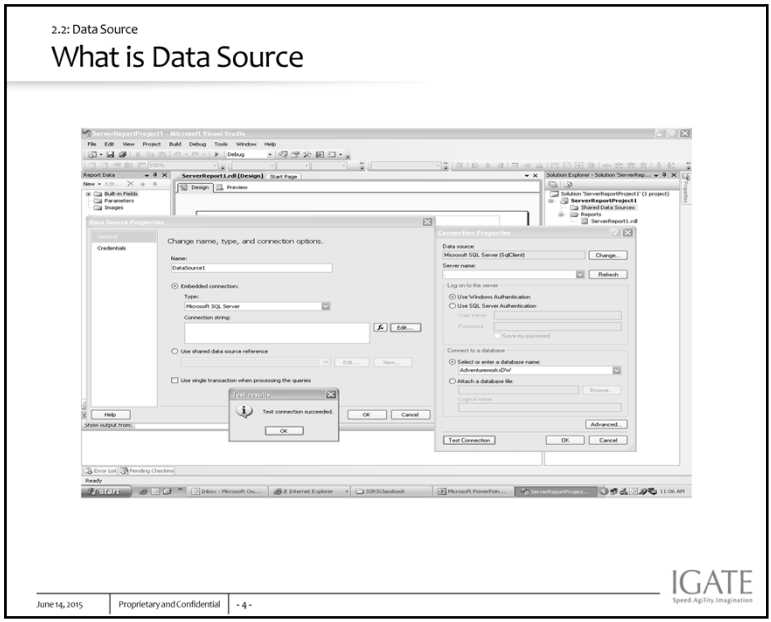
Lesson Objectives

- **Authoring various types of reports**
  - Data Source
  - Data Sets
  - Data Regions
  - Grouping
  - Summation

2.1: Reporting Authoring

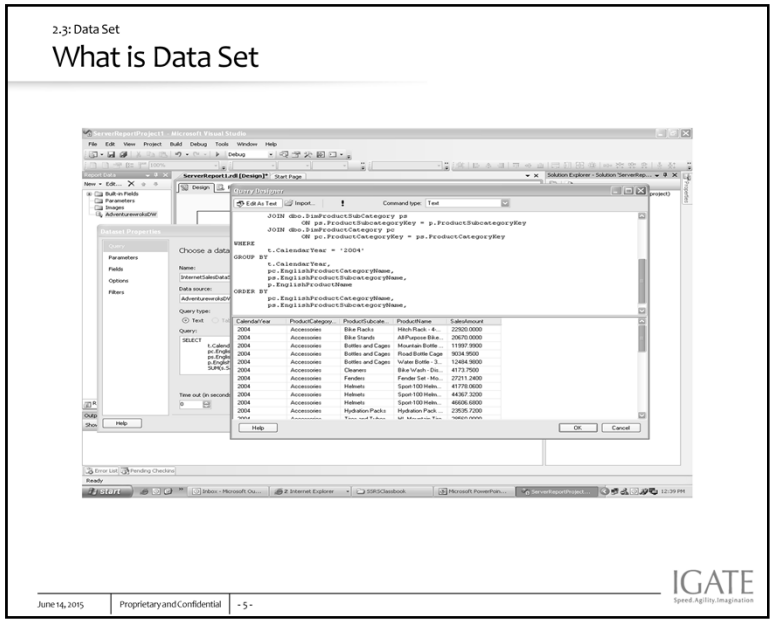
Report Authoring using Report Designer

- **We can create different types of reports using SSRS report designer.**
  - Tabular Report
  - Group Report
  - Drill down Report
  - Drill through Report
  - Free Form Report
  - Matrix Report
  - Charts Report
  - Hierarchical Group Report



Data source is the information getting displayed for report. It provides data for executing queries to the report processor like connection string, authentication details, etc. To add new data source in Report project:

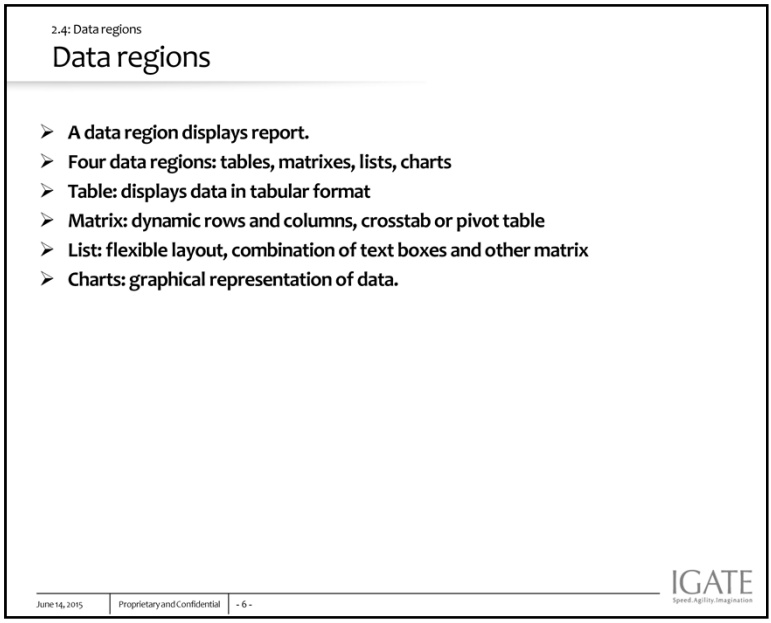
1. In Report Data pane, click New, select Data Source.
2. Name data source as **AdventureWorksDS**.
3. Select embedded connection for Microsoft Sql Server.
4. In Connection strings. Select Edit button that opens Connection Properties window.
5. Select server name and select database name.
6. Test the connection. If it gets successfully tested, click on OK.



Once data source is created, we need to add Data set for retrieving data for report. A dataset is a container that provides data values to Report processor.

To add a dataset:

1. In Report Data pane, click New, and select Dataset.
2. Name the dataset.
3. Import Query Designer, write query for fetching details. Click on Run button to ensure that query returns values.
4. Click OK to close Query Designer window.
5. Dataset appears below Datasource.


2.4: Data regions
Data regions
A data region displays report.
Four data regions: tables, matrixes, lists, charts
Table: displays data in tabular format
Matrix: dynamic rows and columns, crosstab or pivot table
List: flexible layout, combination of text boxes and other matrix
Charts: graphical representation of data.
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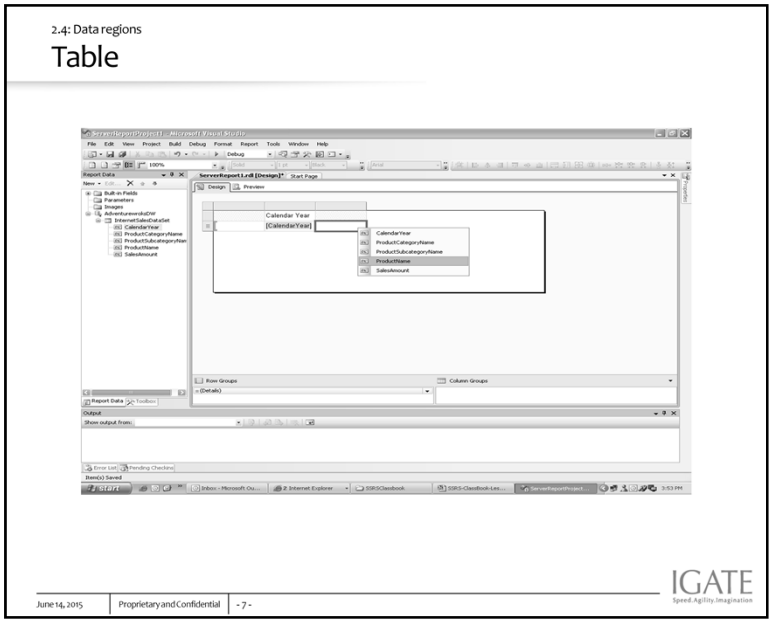
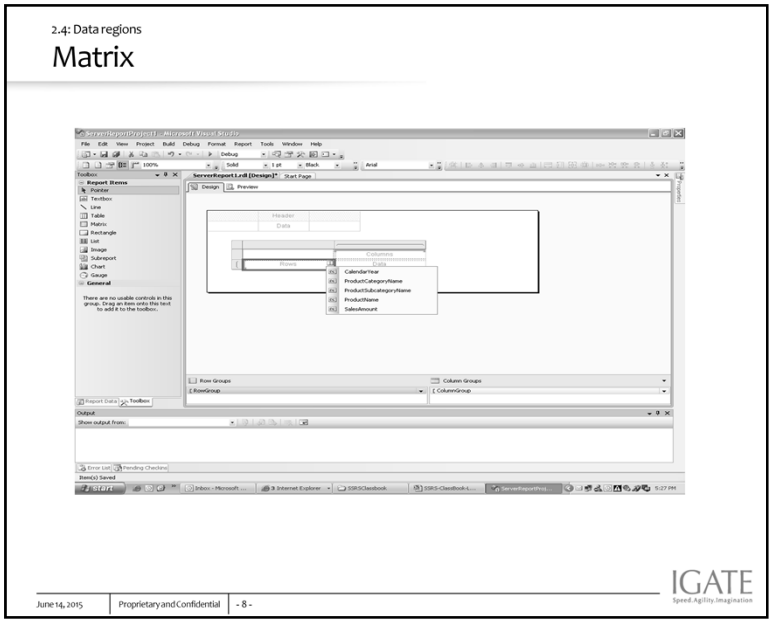


Table has rows and columns combination. It has fixed length depends on rows returned by dataset query. You can specify header for the columns or footer for aggregated values. To add table to report:

1. Go to Toolbox. Double click on Table.

To add fields to table:

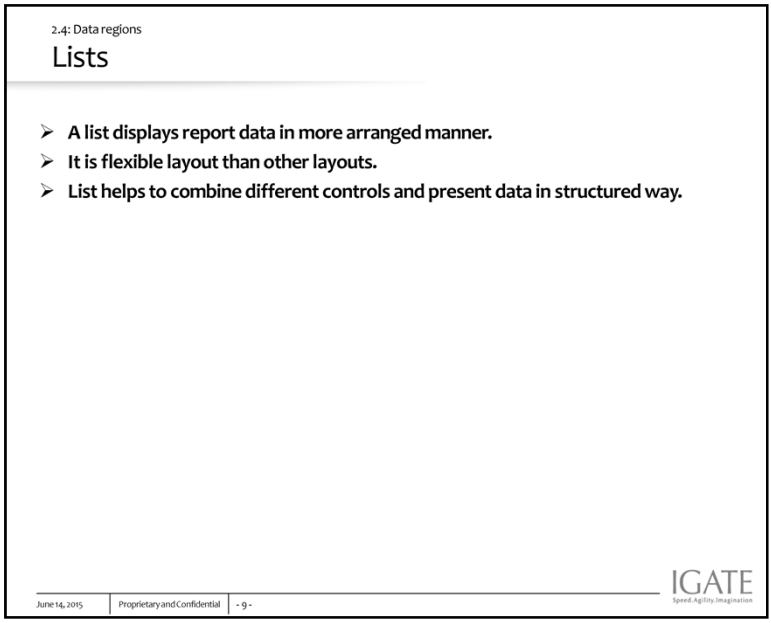
1. Open Report Data window.
2. Drag any column field listed into data tab. By adding field value to column we bound dataset to table.
3. Click on Preview tab to view the report.
4. Close the output window.



Unlike tables, matrix data region has dynamic rows and columns. It displays data like crosstab or pivot table.

To create matrix report:

1. Go to Toolbox. Click on Matrix.
2. Drag and drop data fields from data set in columns.



List is more flexible layout than matrix. You can create layout as a combination of text boxes and other data regions.

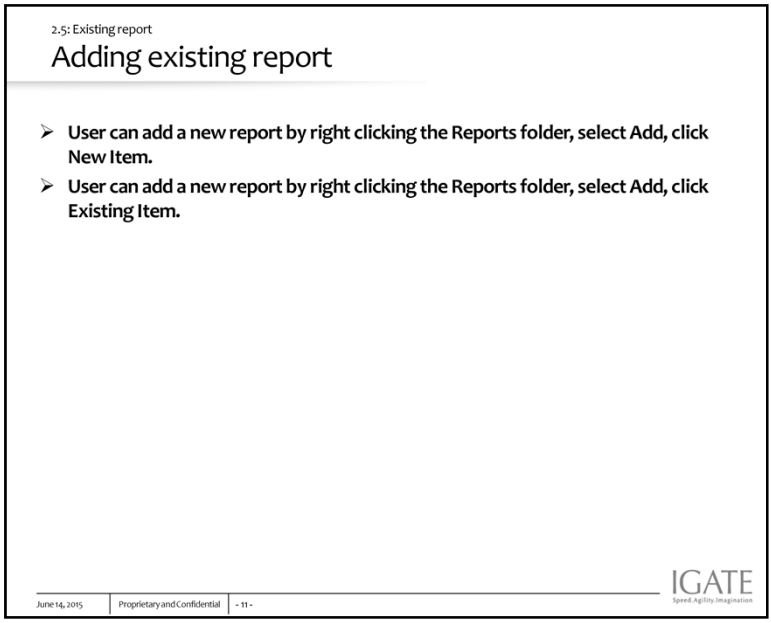
To display text box and a matrix in a list:

1. Drag a matrix control on design tab.
2. Associate it with data.
3. Drag List control from Toolbox window on matrix area.
4. Right click in matrix, Click Tablix2 to select matrix. Drag matrix into list.
5. Right click in list, select Tablix3b to select list.
6. In properties window for list, select DatasetName as created dataset.
7. In Grouping pane, right click Details1 group, and click Group Properties. Click Add.
8. In Group On drop-down list, select group criteria and click OK.
9. Drag a text box from Toolbox and place it above matrix. Bind data to it.
10. Save and review the report.

2.4: Data regions

Charts

- Charts are visual presentation of summarized data.
- It gives graphical or pictorial view of data for analysis
- Charts provide better understanding of data in the form of graphs.
- Reports can be created using only charts or can be merged with statistical reports.
- User can insert chart inside table, matrix or list.


2.5: Existing report
Adding existing report
User can add a new report by right clicking the Reports folder, select Add, click New Item.
User can add a new report by right clicking the Reports folder, select Add, click Existing Item.
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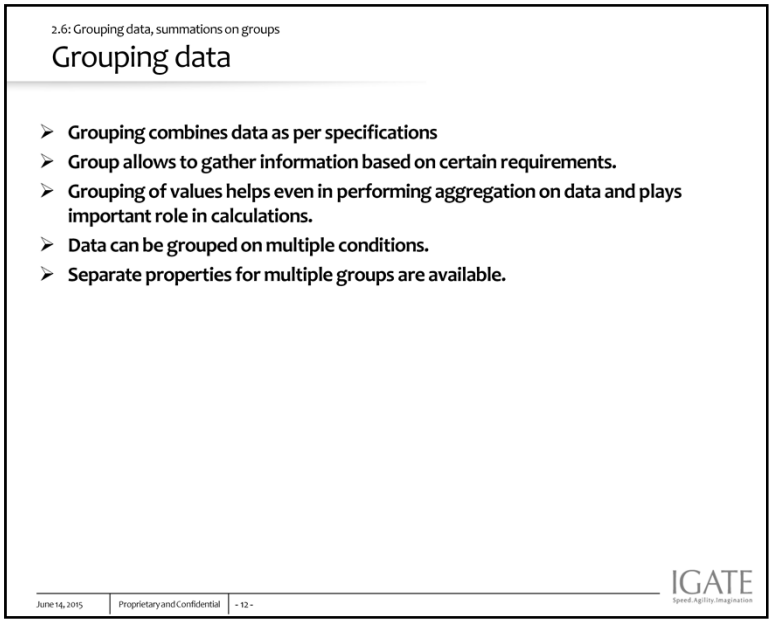
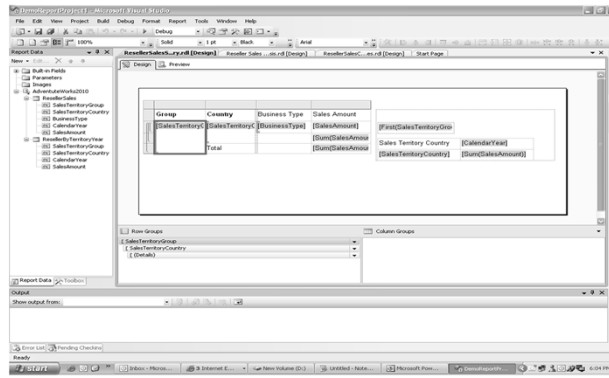


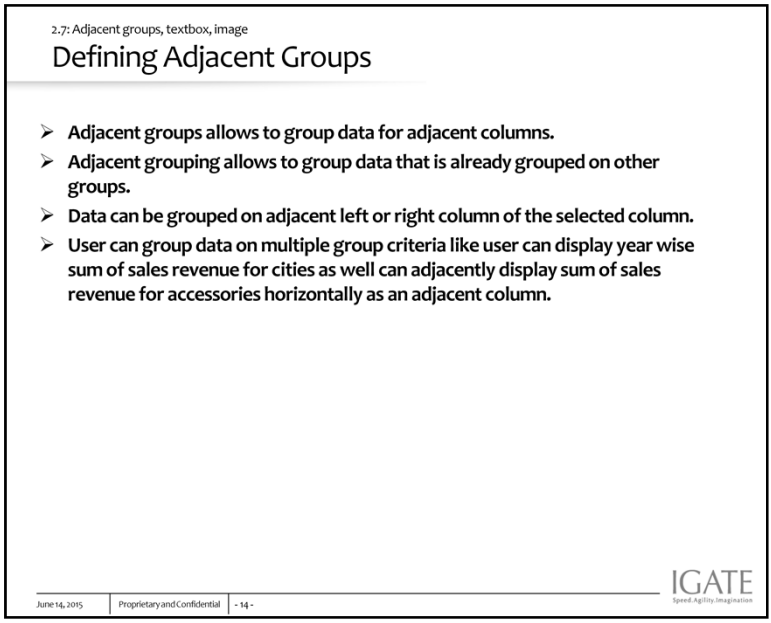
To Group data in table:

1. Click on Design tab.
2. Right click second row of the first column, select Add group.
3. In Row group, select Parent Group. There is Column Group option as well.
4. In the Tablix Group dialog box, select Group criteria for one of the row values.
5. Click OK to close the Tablix Group dialog box.
6. Right click the second row of the first column, select Add Group, in Row Group section, click Child Group.
7. Click the first row of the first column, highlight Group1, name the Group.
8. Click the first row of the second column, highlight Group2, and name the Group.
9. In Grouping pane, right click Group1, click Group Properties.
10. Select Group criteria.
11. Click OK to close Group properties dialog box.
12. In Grouping pane, right click Group2, click Group Properties.
13. Select Group criteria.
14. Click OK to close Group properties dialog box.
15. Save the project
16. Preview the report.

2.6: Grouping data, summations on groups

Grouping data (Contd…)





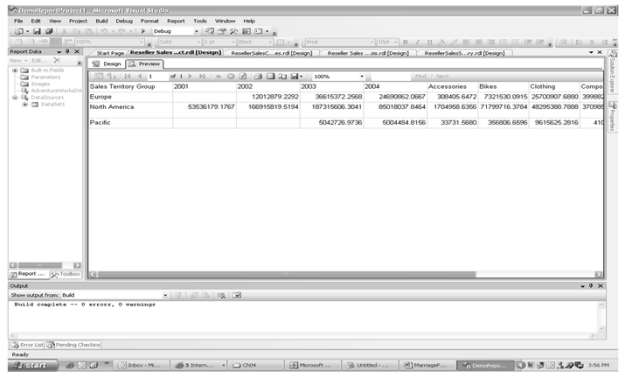
Display yearly territory group wise sum of sales amount and adjacent to it accessories wise territory group wise sum of sales amount.

Steps to add adjacent groups:

1. Go to Design tab.
2. Report is getting displayed for yearly territory group wise sum of sales amount.
3. Right click Year column, Add Group, Adjacent right.
4. In Tablix Group dialog box, Group by select Accessories and click Sales Amount.
5. Save and preview the report.
6. Report gets displayed for sum of Sales Amount for Territory Group for two column categories, one for yearly sum and another for category wise sum.

2.7: Adjacent groups, textbox, image

Defining Adjacent Groups (Contd…)



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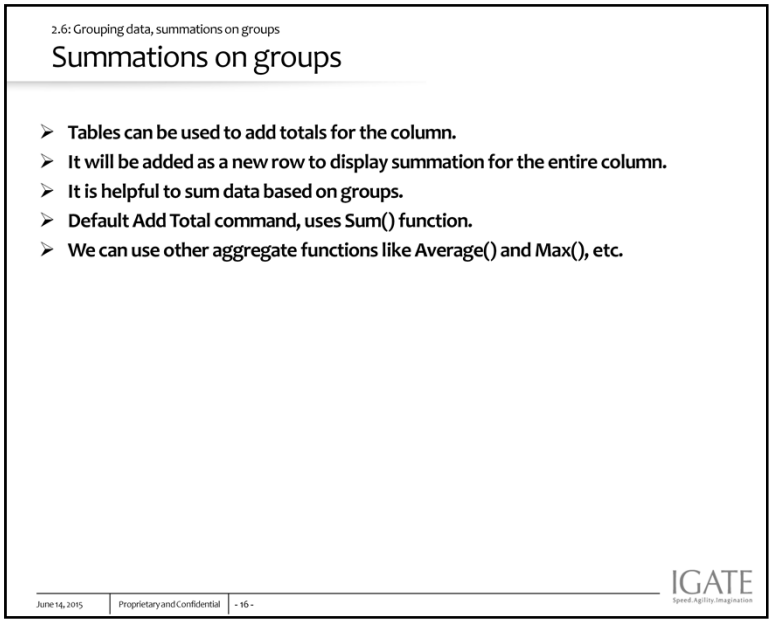
Display yearly territory group wise sum of sales amount and adjacent to it accessories wise territory group wise sum of sales amount.



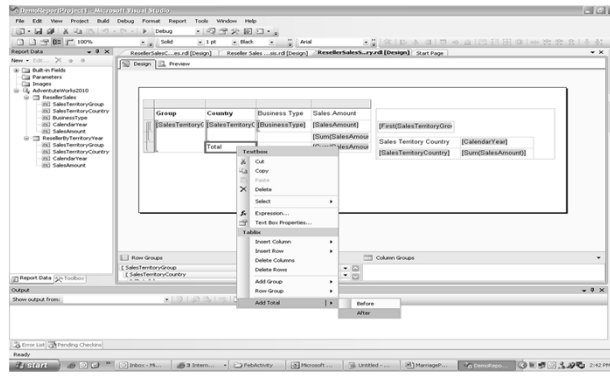
Display yearly sum of sales Amount

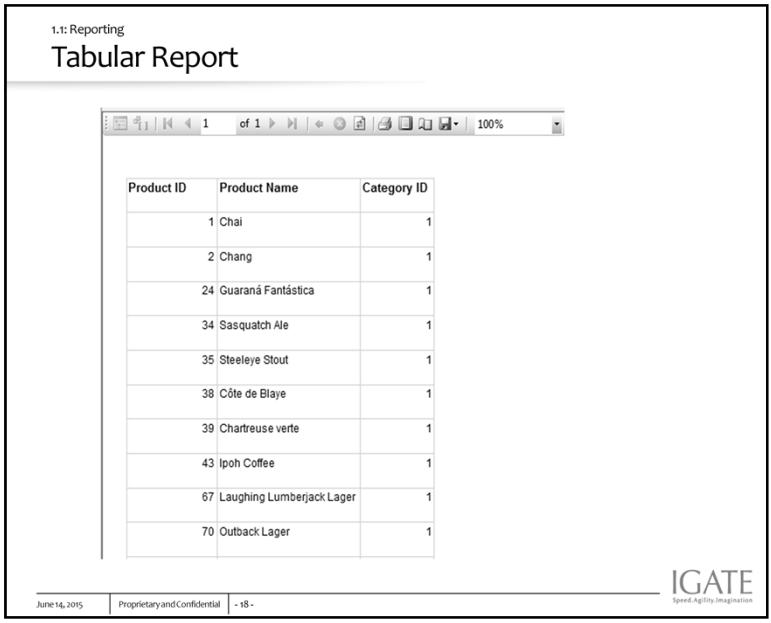
To add total to row Groups:

1. Click on Design tab.
2. Right click text box containing numeric field like SalesAmount and click Add Total.
3. New row appears as a group footer row for the group.
4. Save the report.

2.6: Grouping data, summations on groups

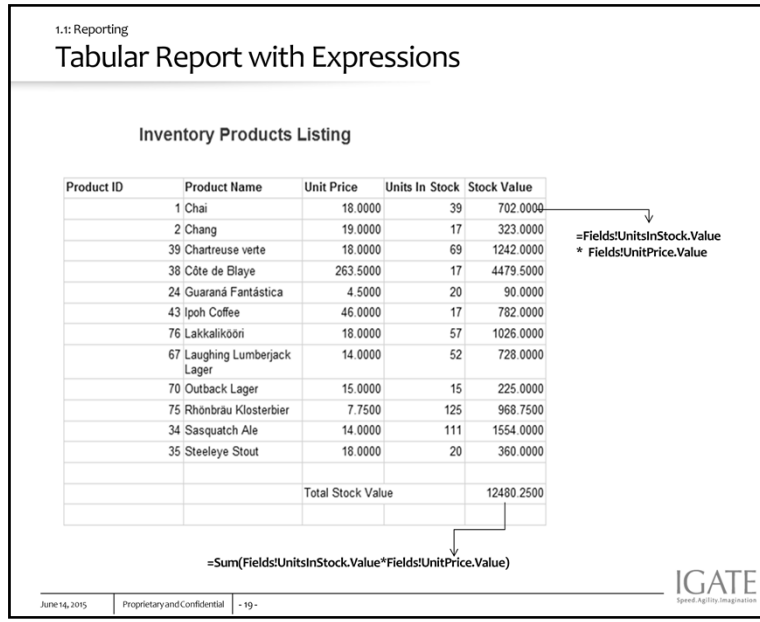
Summations on groups (Contd…)





Usually whenever we design a report, it has fixed number of columns. For example, if we design a report showing a list of all employees, we may choose Employee ID, First Name, Last Name, Email Address, Mobile No. and Gender columns. So here, we know that how many columns we are going to show in a report, and, we fix those columns in the report during design time.

However, the numbers of rows vary and this report could give us one page or more than multiple pages output, but design do not change. It meams that columns are always fixed and rows vary depending upon volume of data. This type of report is known as a **Tabular report**.

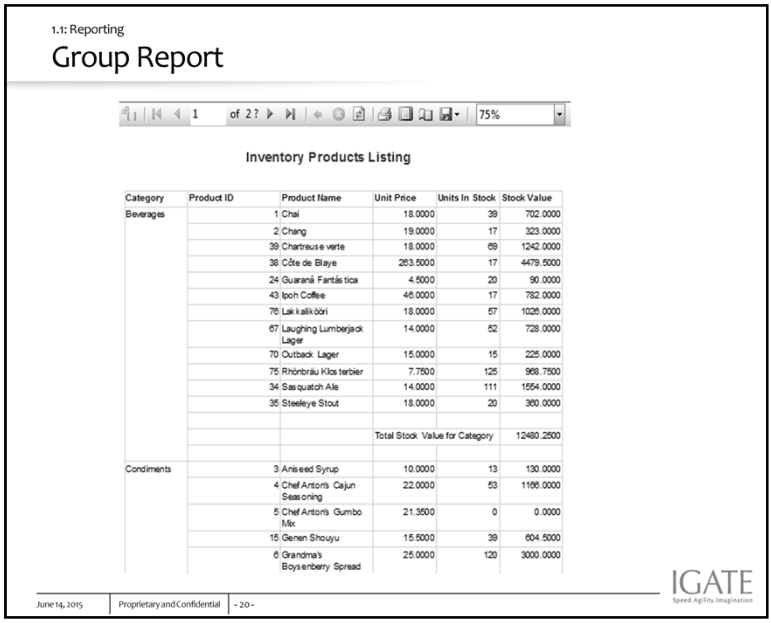


In Reporting Services, expressions are used throughout the report definition to specify or calculate values for parameters, queries, filters, report item properties, group and sort definitions, text box properties, bookmarks, document maps, dynamic page header and footer content, images, and dynamic data source definitions.
Expressions begin with an equal (=) and are written in Microsoft Visual Basic. Expressions can include a combination of constants, operators, and references to built-in values (fields, collections, and functions), and to external or custom code. Expressions can be one of the following two types:

Simple An expression that is a single reference to an item in a built-in collection, such as, a dataset field, a parameter, or a built-in field. Simple expressions appear on the design surface and in dialog boxes in brackets, such as [FieldName], which represents the underlying expression =Fields!FieldName.Value. You can type simple expressions directly into a text box on the design surface and the corresponding expression text is set as the value of a placeholder inside the text box. For more information, see Formatting Text and Importing HTML.

Complex An expression that includes more than a simple reference. Complex expressions appear on the design surface as <<Expr>>. You can create complex expressions in the **Expression** dialog box or type them directly into the **Property** pane. For more information about what you can include in an expression

When you write an expression in Reporting Services, you have access to many built-in fields, built-in collections, and functions that you can use alone or combine with other terms. When you create an expression interactively in the **Expression** dialog box, you can explore the categories of references that you can include, and see context-sensitive examples of constants, built-in collections, and functions available for including in your expressions.


1.1: Reporting

Group Report

1 of 2? 75%

Inventory Products Listing

Category	Product ID	Product Name	Unit Price	Units In Stock	Stock Value
Beverages	1	Chai	18.0000	39	702.0000
	2	Chang	19.0000	17	323.0000
	39	Chartreuse verte	18.0000	69	1242.0000
	38	Côte de Blaye	263.5000	17	4479.5000
	24	Guaraná Fantástica	4.5000	20	90.0000
	43	Ipoh Coffee	46.0000	17	782.0000
	76	Lakkalikööri	18.0000	57	1026.0000
	67	Laughing Lumberjack Lager	14.0000	52	728.0000
	70	Outback Lager	15.0000	15	225.0000
	75	Rhönbräu Klosterbier	7.7500	125	968.7500
	34	Sasquatch Ale	14.0000	111	1554.0000
	35	Steeleye Stout	18.0000	20	360.0000
			Total Stock Value for Category		12480.2500
Condiments	3	Aniseed Syrup	10.0000	13	130.0000
	4	Chef Anton's Cajun Seasoning	22.0000	53	1166.0000
	5	Chef Anton's Gumbo Mix	21.3500	0	0.0000
	15	Genen Shouyu	15.5000	39	604.5000
	6	Grandma's Boysenberry Spread	25.0000	120	3000.0000

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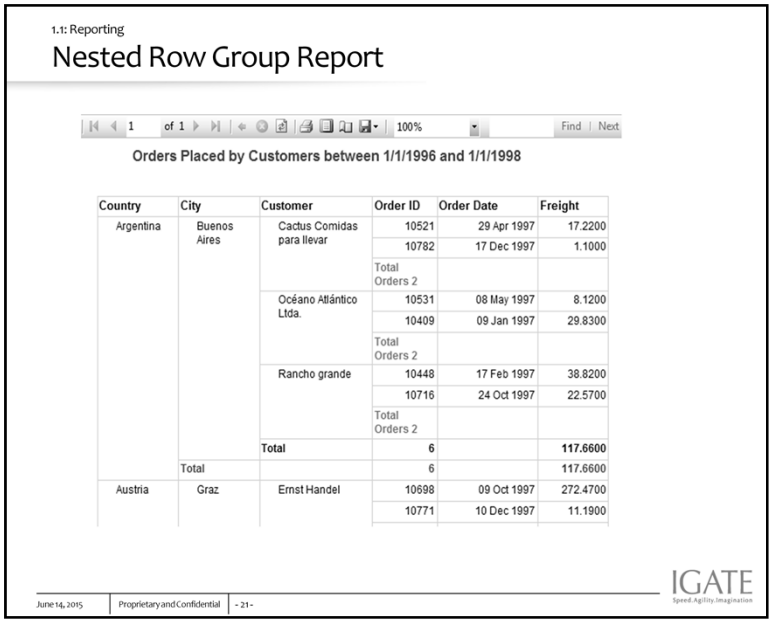
In Report Designer, we can use groups to organize data on the report or to calculate aggregate summaries

In Report Designer, a group is a named set of data from the report dataset that is bound to a data region. Basically, a group organizes a view of a report dataset. All groups in a data region specify different views of the same report dataset.

A group has a name and a set of group expressions that you specify. The set of group expressions can be a single dataset field reference or a combination of multiple expressions. At runtime, Report Designer combines and applies group expressions to data in a group.

Groups can be nested within one another to have parent child relationship. We can think of the parent/child groups as a tree structure.



Groups in a Tablix Data Region

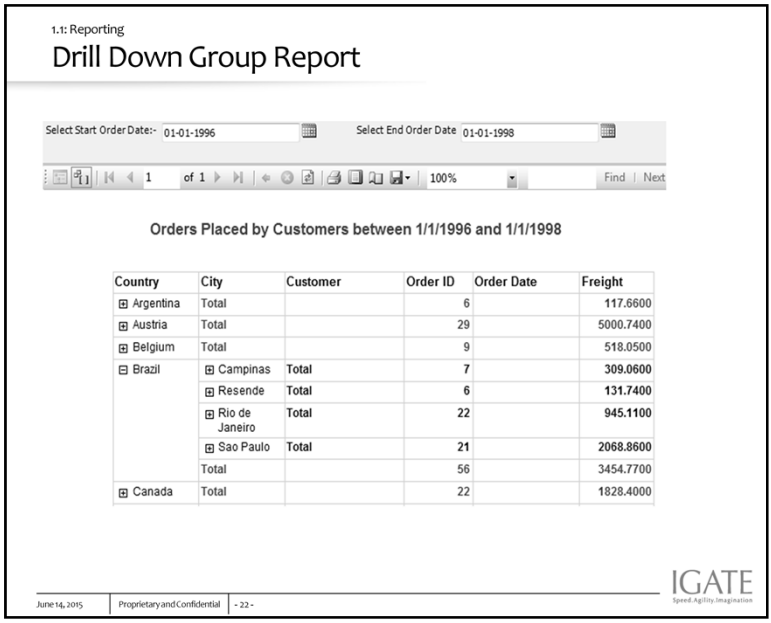
Details Group The Details group consists of all data from a report dataset after Report Designer applies dataset and data region filters. Thus, the Details group is the only group that has no group expression.

Basically, the details group specifies the data that you would see when you run a dataset query in a query designer. For example, you have a query that retrieves all columns from a sales order table. Thus, the data in this detail group includes all the values for every row for all the columns in the table. The data in this detail group also includes values for any calculated dataset fields that you have created.

By default, when you add a table or list to your report, Report Designer automatically creates the Details group for you, and adds a row to display the detail data. When you view the data region, the details row repeats once for every value in the result set.

Row groups and column groups You can organize data into groups by rows or columns. Row groups expand vertically on a page. Column groups expand horizontally on a page. Groups can be nested, for example, group first by [Year], then by [Quarter], then by [Month]. Groups can also be adjacent, for example, group on [Territory] and independently on [ProductCategory].

Recursive hierarchy groups A recursive hierarchy group organizes data from a single report dataset that includes multiple levels. For example, a recursive hierarchy group could display an organization hierarchy, for example, [Employee] that reports to [Employee]. Reporting Services provides group properties and built-in functions to enable you to create groups for this kind of report data.


1.1: Reporting

Drill Down Group Report

Select Start Order Date:- 01-01-1996 Select End Order Date 01-01-1998

1 of 1 100% Find | Next

Orders Placed by Customers between 1/1/1996 and 1/1/1998

Country	City	Customer	Order ID	Order Date	Freight
⊞ Argentina	Total		6		117.6600
⊞ Austria	Total		29		5000.7400
⊞ Belgium	Total		9		518.0500
⊟ Brazil	⊞ Campinas	**Total**	**7**		**309.0600**
	⊞ Resende	**Total**	**6**		**131.7400**
	⊞ Rio de Janeiro	**Total**	**22**		**945.1100**
	⊞ Sao Paulo	**Total**	**21**		**2068.8600**
	Total		56		3454.7700
⊞ Canada	Total		22		1828.4000

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Hiding Report Items Conditionally

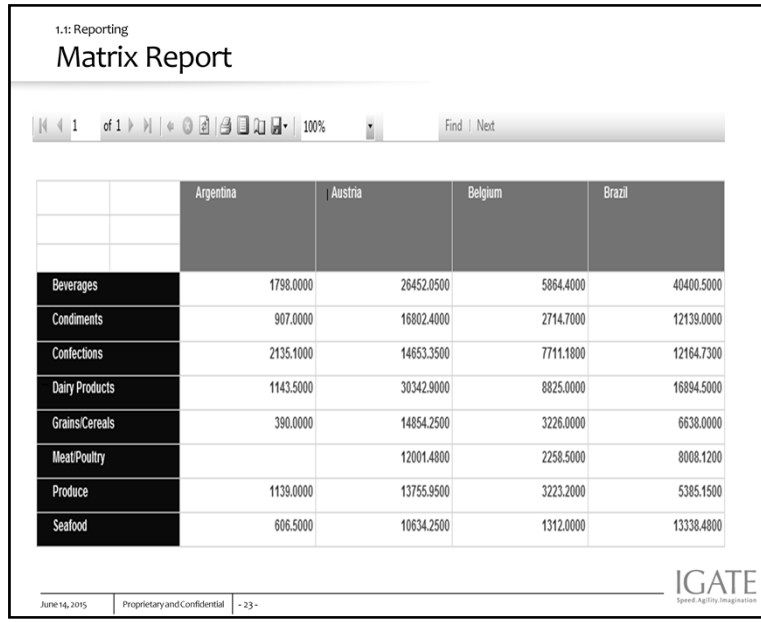
You can control whether a report item initially displays or is hidden when a user views a report. By providing a toggle on a text box, you can enable users to hide and display items interactively. For a table or matrix, you can show or hide static rows and columns, or rows and columns that are associated with groups.

The main reason for hiding items is to provide a report that shows summary data but enables a user to drill down into detail data.
For example, you can initially hide all the rows except the outer group summary row for a table with row groups. For each inner group (including the details group), add a toggle to the grouping cell of the containing group. When the report is rendered, the user can click the text box to expand and collapse the detail data.

Drillthrough Reports
A Drillthrough report enables a user to click a link for a summary value and open a separate, related report to show detail data. The detail data is only retrieved when the detail report runs. Drillthrough reports typically require fewer resources than drilldown reports
For example, a sales order summary report might list all the sales orders for a sales person, and when each sales order number might link to a report that shows the details of that order.

If the data for the main report and the detail report must be retrieved at the same time, consider using a drilldown report or a subreport.

Drillthrough reports typically have report parameters that specify which report data to display. For example, when you click a sales order number in a main report, a drillthrough report opens, which accepts the sales order number as a parameter, and then displays all the data for that sales order. When you create the link in the main report, you must specify values to pass as parameters to the drillthrough report.


1.1: Reporting

Matrix Report

1 of 1 100% Find | Next

	Argentina	Austria	Belgium	Brazil
Beverages	1798.0000	26452.0500	5864.4000	40400.5000
Condiments	907.0000	16802.4000	2714.7000	12139.0000
Confections	2135.1000	14653.3500	7711.1800	12164.7300
Dairy Products	1143.5000	30342.9000	8825.0000	16894.5000
Grains/Cereals	390.0000	14854.2500	3226.0000	6638.0000
Meat/Poultry		12001.4800	2258.5000	8008.1200
Produce	1139.0000	13755.9500	3223.2000	5385.1500
Seafood	606.5000	10634.2500	1312.0000	13338.4800

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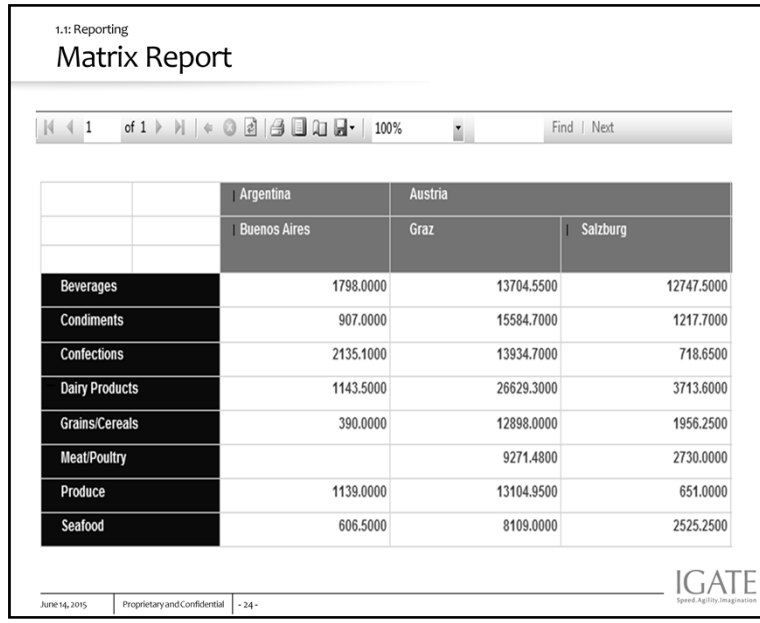
Matrix Reports

We can use a Matrix Report to display grouped data and summary information. You can group data by multiple fields or expressions in row and column groups. Matrices provide functionality similar to crosstabs and pivot tables. At run time, as the report data and data regions are combined, a matrix grows horizontally and vertically on the page. Values in matrix cells display aggregate values scoped to the intersection of the row and column groups to which the cell belongs. You can format the rows and columns to highlight the data you want to emphasize. You can also include drilldown toggles that initially hide detail data; the user can then click the toggles to display more or less detail as needed.

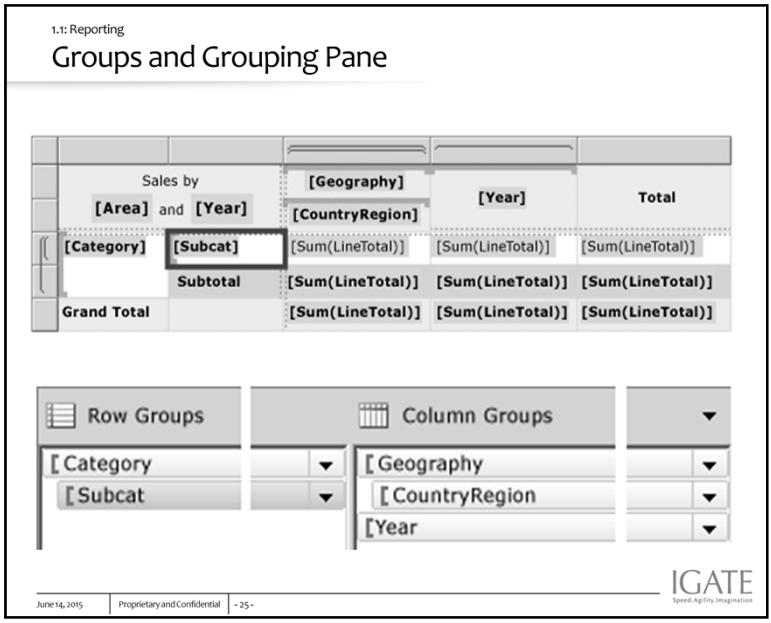


1.1: Reporting

Matrix Report

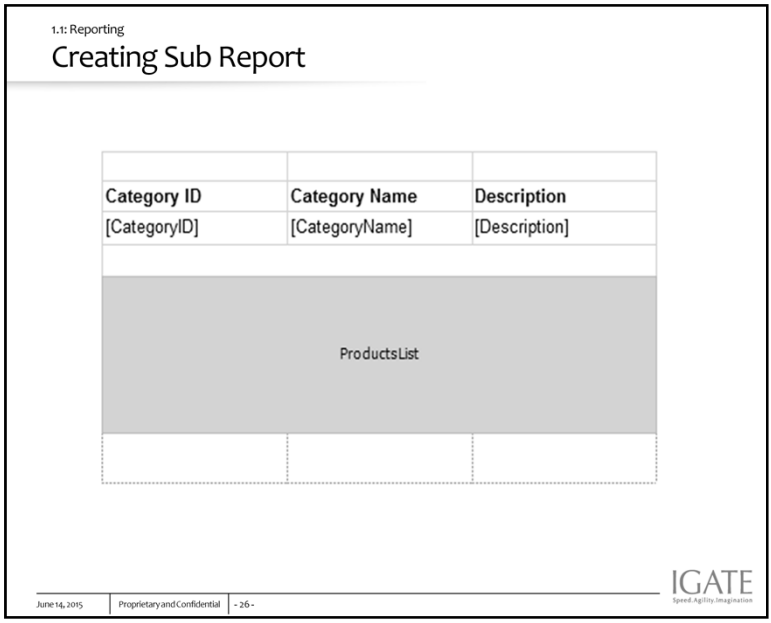
1 of 1 100% Find | Next

		Argentina	Austria	
		Buenos Aires	Graz	Salzburg
Beverages		1798.0000	13704.5500	12747.5000
Condiments		907.0000	15584.7000	1217.7000
Confections		2135.1000	13934.7000	718.6500
Dairy Products		1143.5000	26629.3000	3713.6000
Grains/Cereals		390.0000	12898.0000	1956.2500
Meat/Poultry			9271.4800	2730.0000
Produce		1139.0000	13104.9500	651.0000
Seafood		606.5000	8109.0000	2525.2500



Grouping Pane

The Grouping pane displays the row groups and column groups for the currently selected Tablix data region. The Grouping pane is not available for the Chart or Gauge data regions. The Grouping pane is comprised of a Row Groups pane and a Column Groups pane. The Row Groups pane and the Column Groups pane display a hierarchical view for all parent groups, child groups, and adjacent groups. A child group appears indented under its parent group. An adjacent group appears at the same indent level as its sibling groups. The following figure shows a Tablix data region with nested row groups and nested and adjacent column groups.



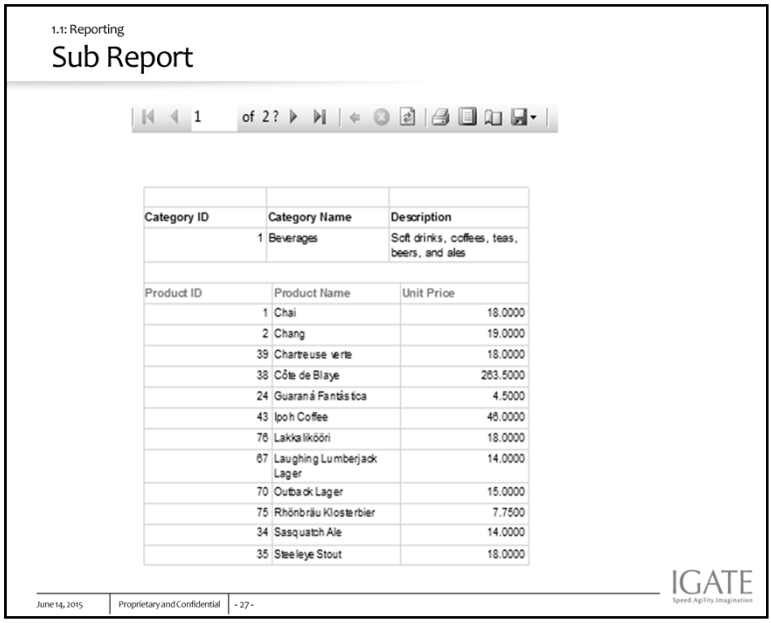
Sub Reports

A sub report is a report item that displays another report inside the body of a main report. Conceptually, a sub report is similar to a frame in a Web page. It is used to embed a report within a report. Any report can be used as a sub report.

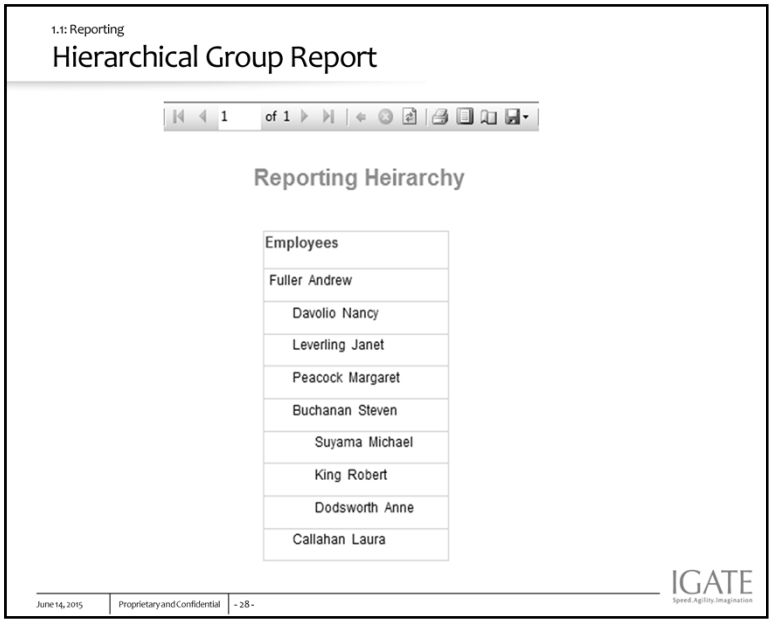
You can design the parent report to pass parameters to the sub report. A sub report can be repeated within data regions, using a parameter to filter data in each instance of the sub report.

You can place a sub report in the main body of the report, or in a data region. If you place a sub report in a data region, the sub report will repeat with each instance of the group or row in the data region. To pass a value from the group or row to the subreport, in the sub report value property, use a field expression for the field containing the value you want to pass to the sub report parameter.

To pass parameters from the parent report to the subreport, define a report parameter in the report that you use as the subreport. When you place the sub report in the parent report, you can select the report parameter and a value to pass from the parent report to the report parameter in the subreport.



In Report Designer, if you preview a report that contains subreports, and then change the subreport, the preview may not be updated. To see the changes, click the **Refresh** button.



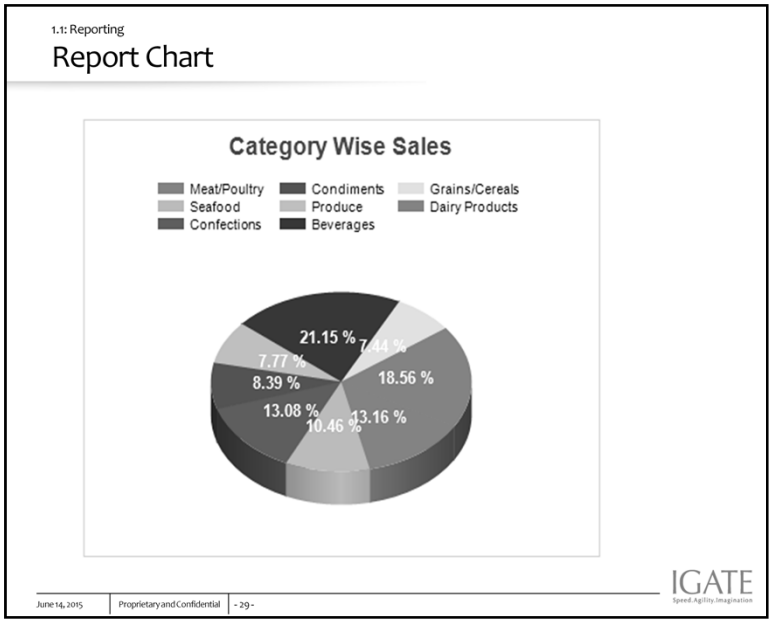
Creating Recursive Hierarchies

To display recursive data where the relationship between parent and child is represented by fields in the dataset, you can set the data region group expression based on the child field and set the **Parent** property based on the parent field.

Displaying hierarchical data is a common use for recursive hierarchy groups, for example, employees in an organizational chart. The dataset includes a list of employees and the managers, where the manager names also appear in the list of employees.

To build a recursive hierarchy in a Tablix data region, you must set the group expression to the field that specifies the child data and the **Parent** property of the group to the field that specifies the parent data. For example, for a dataset that includes fields for employee ID and manager ID where employees report to managers, set the group expression to employee ID and the **Parent** property to manager ID.

A group that is defined as a recursive hierarchy (that is, a group that uses the **Parent** property) can have only one group expression. You can use the **Level** function in text box padding to indent employee names based on their level in the hierarchy.



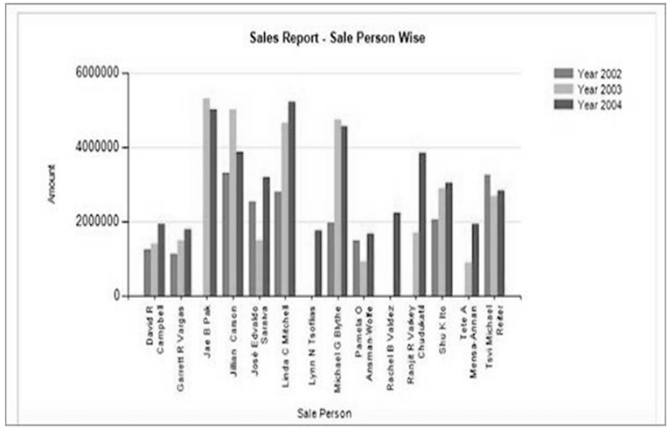
Report Charts

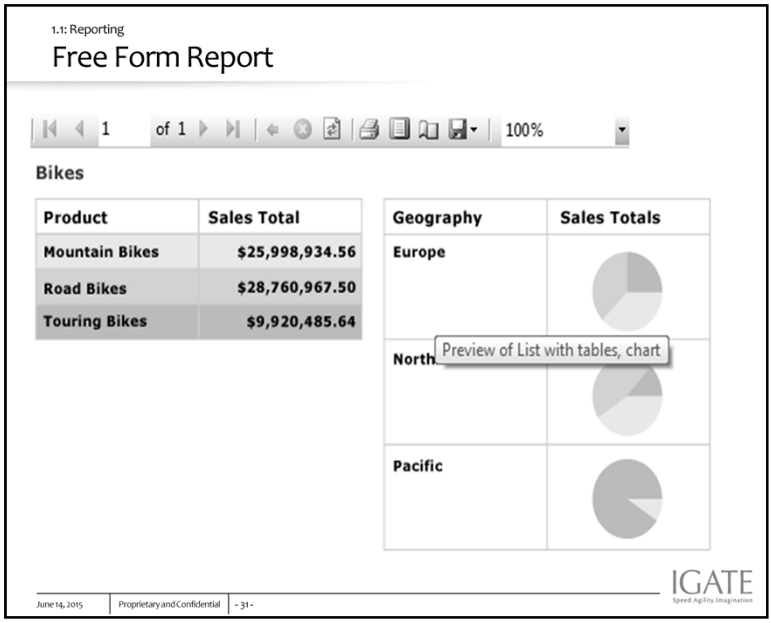
One of the greatest rewards of developing any type of report is to transform the vast amounts of business data into useful information that can support commercial decision-making; producing such reports as the performance of an internal process, percentage of an employees' contribution to overall product sales, or a department's budget compared to other departments. It can become a real challenge for the developer of a report to present this vast amount of information properly, because the correct interpretation of data by the user is as important as the data itself.

One solution is to present the data in an aggregated format so that business users can more easily and quickly digest this information. The chart is a tool designed specifically for the presentation of aggregated data. If it is done properly, it is possible for the user to quickly grasp the information available as they dash off to their next meeting, without needing to scroll through, and assimilate, a huge list of tabular results.

1.1: Reporting

Report Chart




1.1: Reporting
Free Form Report
1
of 1
100%
Bikes
Product
Sales Total
Mountain Bikes
$25,998,934.56
Road Bikes
$28,760,967.50
Touring Bikes
$9,920,485.64
Geography
Sales Totals
Europe
North
Preview of List with tables, chart
Pacific
June 14, 2015
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- 31 -
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Summary

- **Authoring various types of reports**
  - Data Source
  - Data Sets
  - Data Regions
  - Grouping
  - Summation