



Microsoft®  
**SharePoint®** 2010

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## *Advanced Developer Training*

**Microsoft®**

# Exposing Business Intelligence with SharePoint 2010

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Name  
Title  
Company

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# Agenda

- Business Intelligence (BI) Primer
- BI Tools in SharePoint 2010
- Visio Services
- Excel Services
- PerformancePoint Services

# **BUSINESS INTELLIGENCE (BI) PRIMER**

# Business Intelligence

- What is Business Intelligence?
  - Analytics
  - OLAP
  - Data Mining
  - Benchmarking
  - Reporting
- What information do decision makers need in order to make effective business critical decisions?



# BI TOOLS IN SHAREPOINT 2010

# Microsoft SharePoint 2010

The **business collaboration platform** for the enterprise and the web



# Microsoft Business Intelligence

Get more out of the products you own

Business User Experience



Business Collaboration Platform



Data Infrastructure & BI Platform



Familiar User Experience

Self-Service access & insight

Business Collaboration Platform

Predictive analysis  
Dashboards & Scorecards  
Data visualization  
Excel Services

Contextual visualization

Data Infrastructure and BI Platform

Analysis Services

Reporting Services

Integration Services

Master Data Services

Data Mining

Data Warehousing



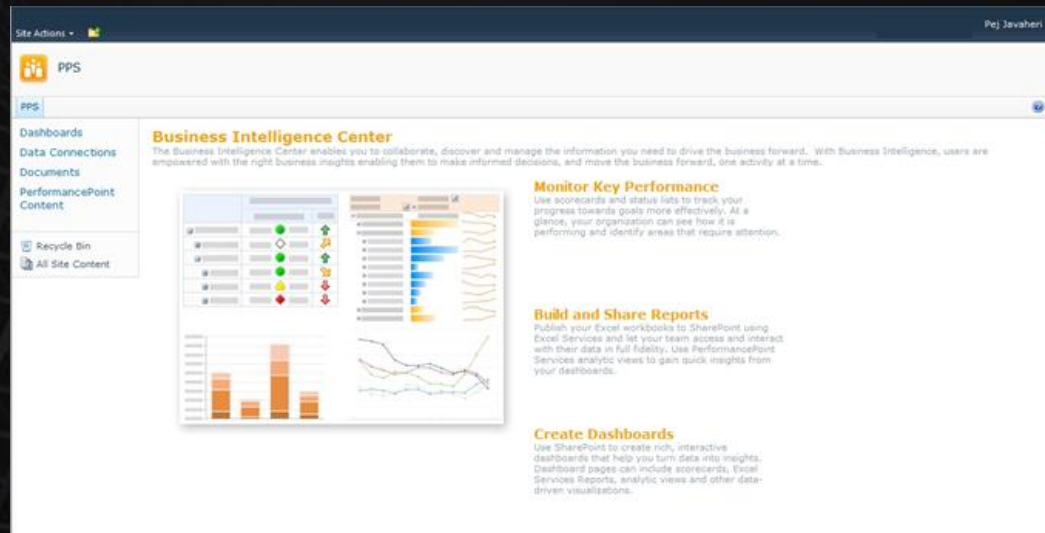
# SQL Server 2008 R2

## Reporting Services & PowerPivot

- Reporting services
  - Does not ship with SharePoint 2010
    - Reporting Services Web Parts can be installed as add-on to SharePoint
  - Used to create professional reports for BI apps
    - Includes reports builder for modifying reports
- PowerPivot
  - Used either for client or server side excel files
  - Makes it possible to work with an extremely large scale of data from multiple, heterogeneous data sources at one time

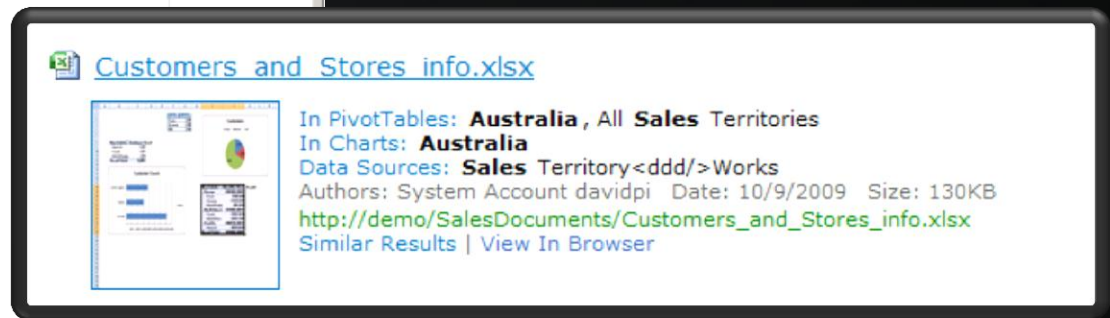
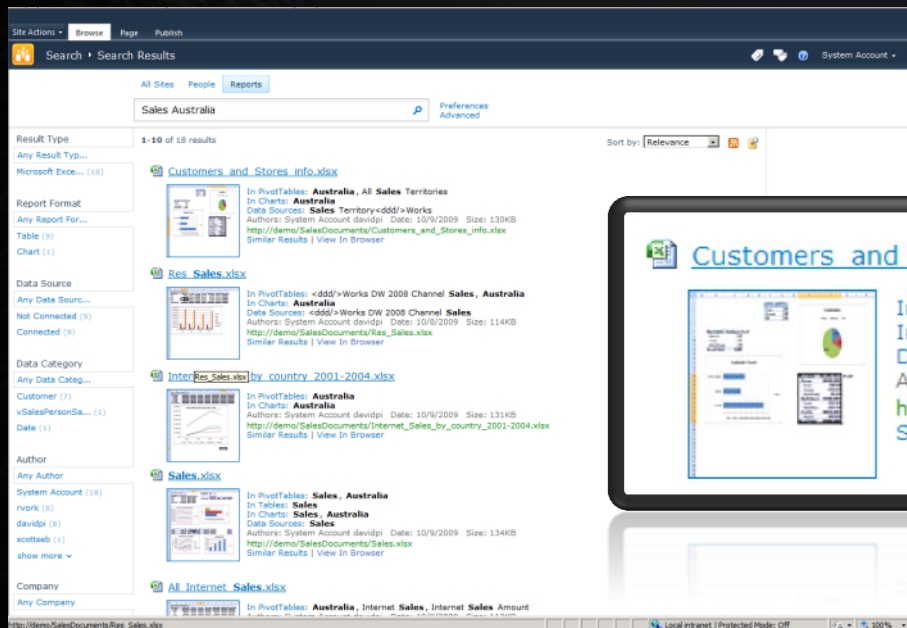
# BI Center Site Template

- Evolution of the Reporting Center template
  - Predefined lists for PPS, Excel Services
  - Starting point for BI
- BI functionalities can be also used in other sites as well





# BI Indexing Connector

- Add-in to FAST Search Server for SharePoint
- Query and Crawl XLSX/XSLM and RDL reports (2005 and higher)
- Improve relevance and search across all documents
- Dedicated Reports tab



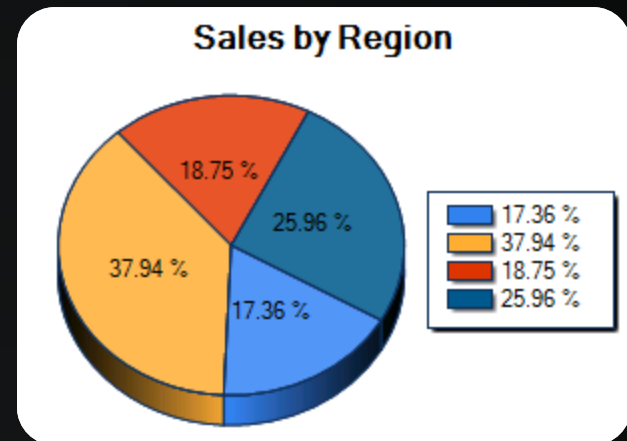
# SharePoint 2010 BI Web Parts

- Simple web parts that provide visualization
  - Quick summary of data
  - Can access multiple data sources

Key Performance Indicators			
Indicator	Goal	Value	Status
Sales Expectations	75%	50%	
Sales Average	\$500,000.00	\$403,337.55	



**Fixed Values**  
**Lists and External Lists**  
**Excel Services**  
**SQL Analysis Services**



**Other Web Parts**  
**Lists and External Lists**  
**Excel Services**

# Chart Web Part & Status Indicators

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*demo*

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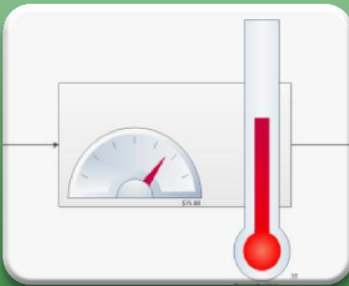
# VISIO SERVICES

# Visio Services Key Features



## Share Diagrams in SharePoint

- Visualize your business intelligence with Visio diagrams
- Diagrams can be viewed without having Visio client installed
- Full Fidelity rendering with Silverlight, or PNG



## Connect Diagrams to Data

- Use data graphics to build front ends for your real-time business intelligence solutions
- Diagrams can be connected to various Data sources



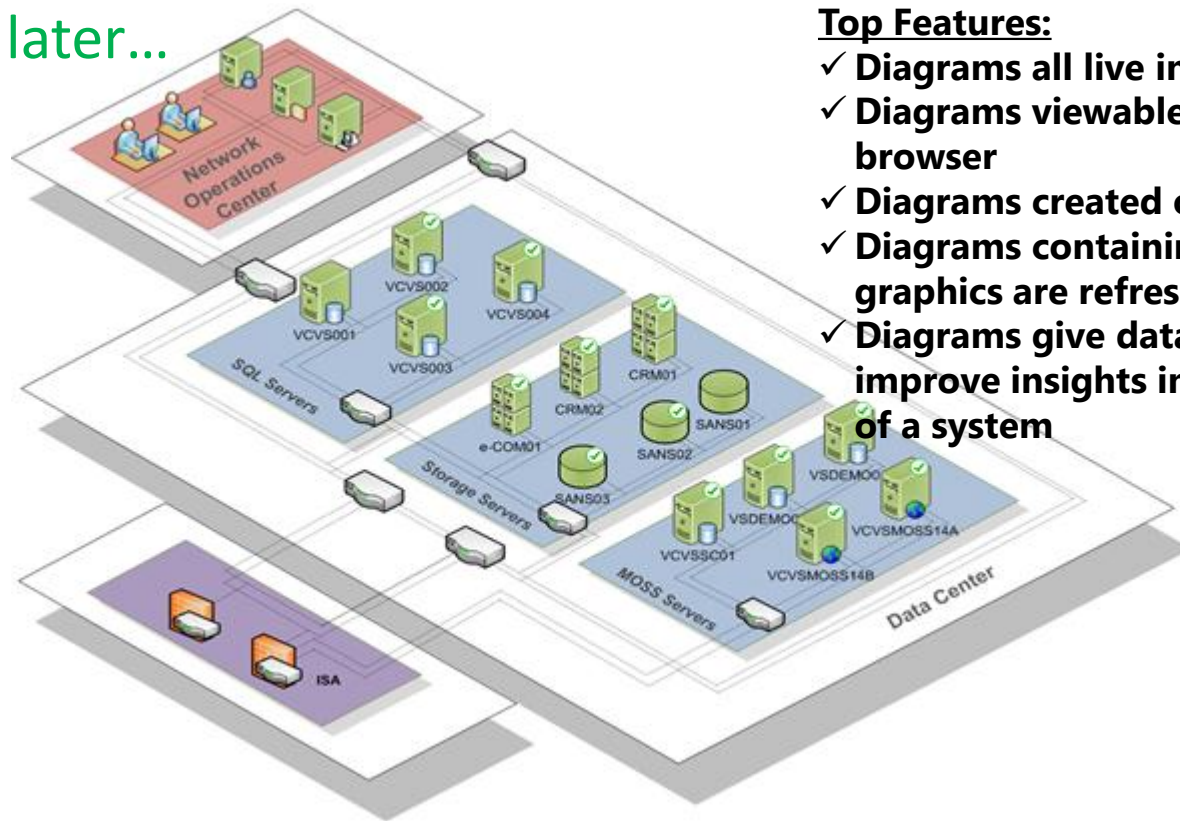
## Build Dashboards

- Use Web Part Connections to integrate with other SharePoint web parts
- Use the Mashup API to fully customize your dashboards and manipulate data

# Visio Services, At a Glance

## "Data-Driven Diagrams in SharePoint"

1 hour later...



### Top Features:

- ✓ Diagrams all live in SharePoint
- ✓ Diagrams viewable in the browser
- ✓ Diagrams created once only
- ✓ Diagrams containing data graphics are refreshable
- ✓ Diagrams give data context and improve insights into the state of a system

Data  
Source

# Visio Services features

- Rendering

- Browser-agnostic 
- Full Fidelity rendering using  Microsoft Silverlight™
- Down-level experience in PNG

- Visual Refresh of Data Diagrams

- Refresh data connected diagrams to:



- Supports Kerberos, SSO & Unattended Auth.
- Automatic refresh

# Visio Services extensibility

## Visio Services JavaScript Object Model

- Enables diagrams to participate in mash-up applications.

## Custom Data Providers

- Enables refresh from non-native data sources.

## Custom Data Graphics

- Enables the refresh of non-native data graphic shapes.

## Web part connections

- Consume and provide information between Visio services and web parts



# Visio Services

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*demo*

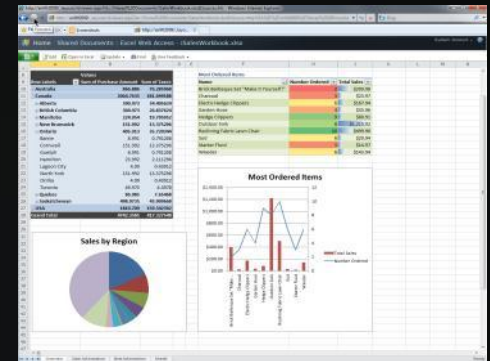
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# EXCEL SERVICES

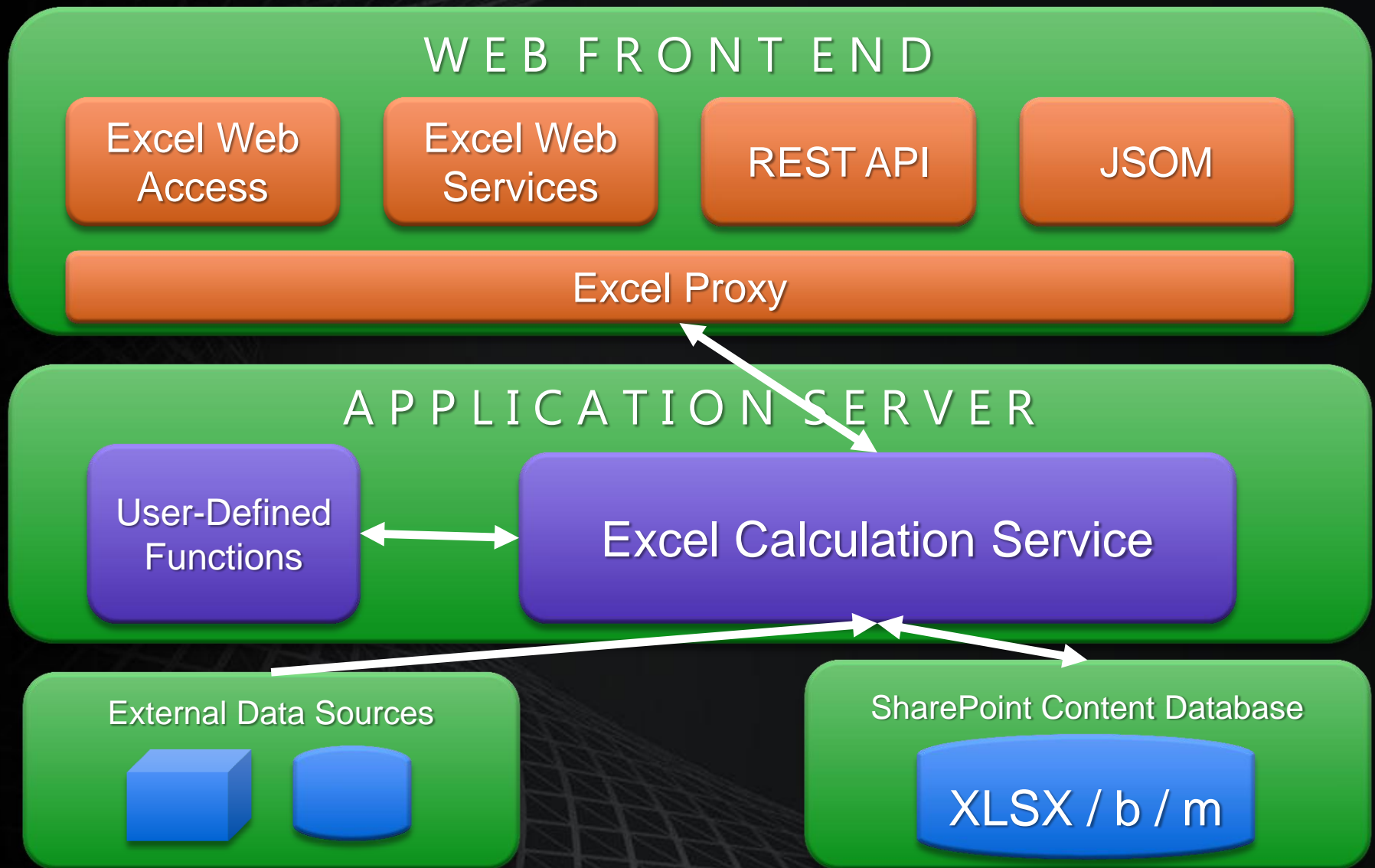
# What is Excel Services?

- Real-time, interactive, end-user BI reporting tool
  - Displays all or targeted elements of Excel workbooks through the browser
  - Extends Excel capabilities such as external data connectivity and Excel based modeling to the browser
- Application Development platform for building data-centric applications
  - Automate workbooks via Web Services API
  - Provide highly interactive application via JSOM
  - Easily distribute Excel content via REST

Row Labels	Column Labels				
	FY '08	FY '09	Sales Discount		
Audio	\$10,555,942.31	\$17,200,917.92	\$229,467.25		\$6,644,975.61
TV and Video	\$93,182,942.69	\$116,522,799.49	\$1,690,534.99		\$23,339,856.80
Computers	\$195,657,367.89	\$214,887,054.54	\$3,394,799.24		\$19,229,686.65
Cameras and camcorders	\$162,347,058.73	\$162,343,038.17	\$2,447,442.83		-\$4,020.56
Cell phones	\$50,957,636.85	\$68,833,757.78	\$815,380.51		\$17,876,120.93
Music, Movies and Audio Books	\$10,725,835.34	\$9,104,128.23	\$156,820.07		-\$1,621,707.11
Games and Toys	\$9,390,756.62	\$25,124,668.85	\$137,152.33		\$15,733,912.22
Home Appliances	\$294,856,555.47	\$284,073,281.35	\$5,736,334.05		-\$10,783,274.12
<b>Grand Total</b>	<b>\$827,674,095.90</b>	<b>\$898,089,646.33</b>	<b>\$14,607,931.27</b>		<b>\$70,415,550.42</b>



# Excel Services Architecture



# Exposing Excel Content

- Excel Web Access (EWA) Web part
  - Displays entire workbook, specific sheets, or specific items
    - \*"Publish" allows content owner fine control over what gets displayed
- Programmatically
  - REST Services
  - Web Services
  - JavaScript Object Model
  - Server-based User Defined Functions



# Excel Workbooks in the Browser

- Provides a browser based view of Excel
- Allows interaction within the Excel Workbook
  - Expand / collapse Pivot Table, Sorting, Filtering, Parameters
- EWA integration with SharePoint filters enable Excel based dashboards
- Excel Web App

The screenshot displays the Excel Web App interface within a browser. It features a PivotTable with 'Internet Sales Amount' as the data source. The PivotTable is structured with 'Row Labels' (countries) and 'Column Labels' (months from January to September 2002). The data is summarized in a table with a 'Grand Total' row. Below the PivotTable, a PivotChart is visible, showing a line graph for the same data. The interface includes standard Excel navigation elements like the ribbon and status bar.

Internet Sales Amount	Column Labels	January 2002	February 2002	March 2002	April 2002	May 2002	June 2002	July 2002	August 2002	September 2002
Australia		\$223,109.11	\$164,161.08	\$232,584.98	\$224,451.06	\$205,688.58	\$209,659.38	\$130,989.75	\$149,740.46	\$116,250.79
Canada		\$50,413.32	\$161,136.41	\$35,579.42	\$67,783.85	\$46,135.95	\$65,222.22	\$51,652.56	\$67,618.48	\$17,417.76
France		\$33,246.07	\$30,316.89	\$42,068.34	\$40,759.17	\$51,786.51	\$35,496.64	\$42,458.40	\$41,607.21	\$48,291.03
Germany		\$9,075.55	\$47,712.43	\$61,123.13	\$53,869.79	\$48,754.06	\$55,033.22	\$39,267.00	\$34,224.00	\$38,210.16
United Kingdom		\$71,298.10	\$47,177.59	\$36,100.24	\$35,376.14	\$26,064.53	\$42,900.22	\$42,599.02	\$64,033.43	\$51,904.90
United States		\$209,604.41	\$100,312.30	\$236,679.10	\$241,452.28	\$295,126.57	\$268,451.97	\$193,398.44	\$188,777.89	\$78,392.36
Grand Total		\$596,746.56	\$550,816.69	\$644,135.20	\$663,692.29	\$673,556.20	\$676,763.65	\$500,365.16	\$546,001.47	\$350,466.99

# Leveraging Existing Excel Solutions

- Share existing Excel applications, analysis, and models by publishing to SharePoint

4		Enter values				Loan summary					
5		Loan amount	\$	20,000.00		Scheduled payment	\$	174.22			
6		Annual interest rate		6.50 %		Scheduled number of payments		180			
7		Loan period in years		15		Actual number of payments		180			
8		Number of payments per year		12		Total early payments	\$	-			
9		Start date of loan		1/1/2009		Total interest	\$	11,359.87			
10		Optional extra payments	\$	-							
11											
12		Lender name: <input type="text"/>									
13											
14											
15											
16		Pmt No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance	Cumulative Interest
17											
18		1	2/1/2009	\$ 20,000.00	\$ 174.22	\$ -	\$ 174.22	\$ 65.89	\$ 108.33	\$ 19,934.11	\$ 108.33
19		2	3/1/2009	19,934.11	174.22	-	174.22	66.25	107.98	19,867.87	216.31
20		3	4/1/2009	19,867.87	174.22	-	174.22	66.60	107.62	19,801.26	323.93
21		4	5/1/2009	19,801.26	174.22	-	174.22	66.96	107.26	19,734.30	431.18
22		5	6/1/2009	19,734.30	174.22	-	174.22	67.33	106.89	19,666.97	538.08
23		6	7/1/2009	19,666.97	174.22	-	174.22	67.69	106.53	19,599.28	644.61
24		7	8/1/2009	19,599.28	174.22	-	174.22	68.06	106.16	19,531.22	750.77
25		8	9/1/2009	19,531.22	174.22	-	174.22	68.43	105.79	19,462.79	856.56
26		9	10/1/2009	19,462.79	174.22	-	174.22	68.80	105.42	19,393.99	961.99
27		10	11/1/2009	19,393.99	174.22	-	174.22	69.17	105.05	19,324.82	1,067.04
28		11	12/1/2009	19,324.82	174.22	-	174.22	69.55	104.68	19,255.28	1,171.72
29		12	1/1/2010	19,255.28	174.22	-	174.22	69.92	104.30	19,185.36	1,276.01

# Programmability

- Web Services (updated for 2010): Increase Developers ability to automate & manipulate Excel work books
  - New methods to supports discovery & retrieval of more workbook objects
  - Ability for a web service based application to participate in a collaborative editing session.
- JavaScript OM (New for 2010): Enable new application scenarios for professional developer
  - Enable Dev to catch and react to user's actions w/in a displayed web
  - Project workbook data via mash up
- REST (New for 2010):
  - No-Code access to Excel workbook content
  - Enables "live" projection of Excel content
- Server based User Defined Functions

# Excel Web Services

- Expanded and enhanced from previous versions
- Supports editing and saving workbook programmatically
- Can be used to:
  - Automate workbook level operations
  - Leverage existing Excel models
  - Provide easily maintainable calculation engine for business applications

# Excel REST API

- Exposes Excel content via simple URL
  - Access charts, tables, PivotTables or ranges
  - Returned formats include: image, html, and xml (atom)
- Enables end users to:
  - Embed dynamic data and charts where-ever a URL can be evaluated (web page, office apps, etc.)
  - Create mashups by using simple references to Excel content
  - <advanced> leverage existing Excel models by passing in values via the URL, and retrieving results as part of the same URL.
- No need to write/deploy custom code
- SharePoint security enforced



# REST Syntax

`http://server/_vti_bin/ExcelRest.aspx/Shared%20Documents/File.xlsx/Model/Ranges('Sheet!A1')`

Handler – the ASPX that handles all Excel Services REST requests

Name of the file as you would access it in SharePoint

Path inside the workbook.

Resource Name	Allows access to...
/Model	The workbook (the binary or the available feeds)
/Model/Ranges	List of named ranges in a workbook (some of them)
/Model/Ranges('RangeName')	Specific range.
/Model/Charts	List of charts
/Model/Charts('ChartName')	Specific Chart
/Model/Tables	List of tables (Lists)
/Model/Tables('TableName')	Specific table
/Model/PivotTables	List of PivotTables
/Model/PivotTables('PivotName')	Specific PivotTable

# JavaScript Object Model (JSOM)

- Add JavaScript code on a Web Part page to programmatically interact with Excel Web Access Web Parts
- Functionality includes
  - JSOM events that are raised when users edit a cell, change the active selection or active cell, and when the workbook has finished rendering
  - Use JSOM to set/get values and to drive the UI (scroll to a range, switch between named items or sheets)

# Excel Services

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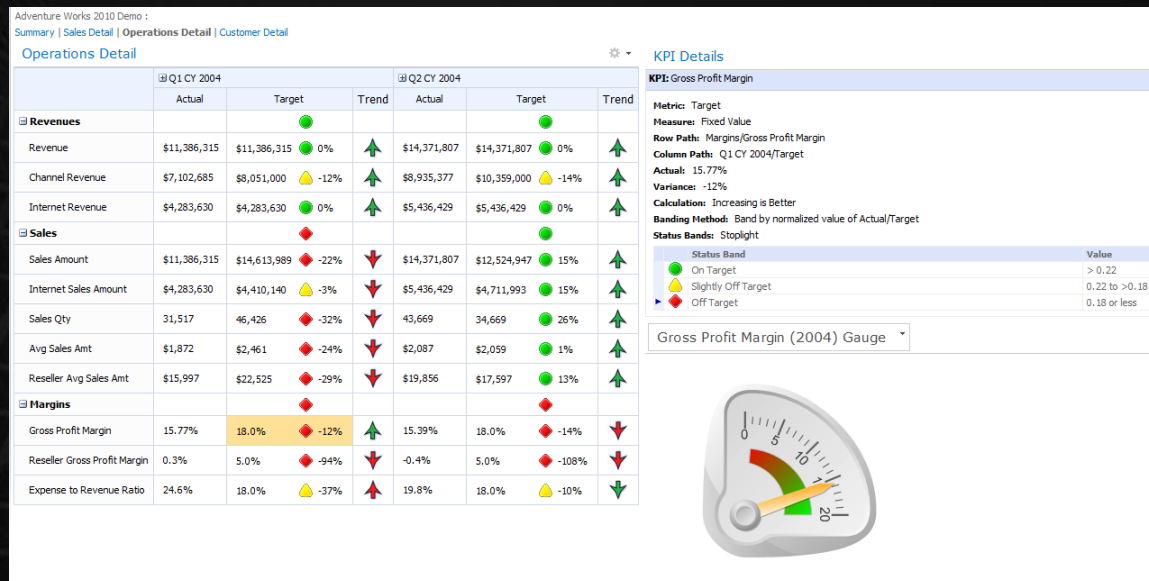
# *Demo*

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# PERFORMANCEPOINT SERVICES

# PerformancePoint Services

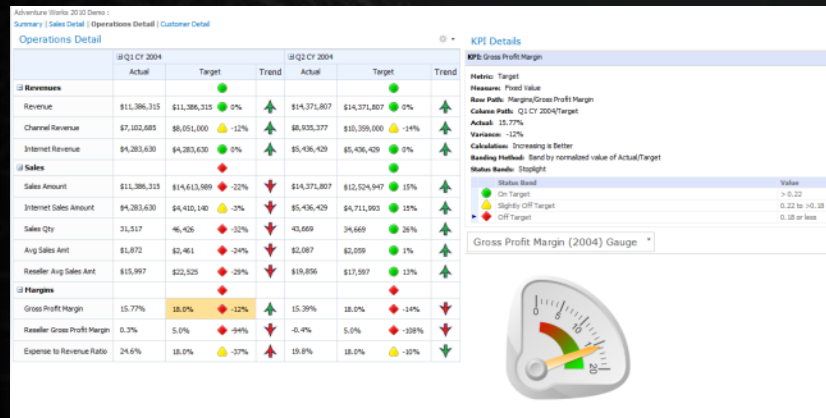
- Context-driven dashboards across systems
- Provides transparency and accountability
- Interactive access using browser
- Can be created/updated by power-users/professionals





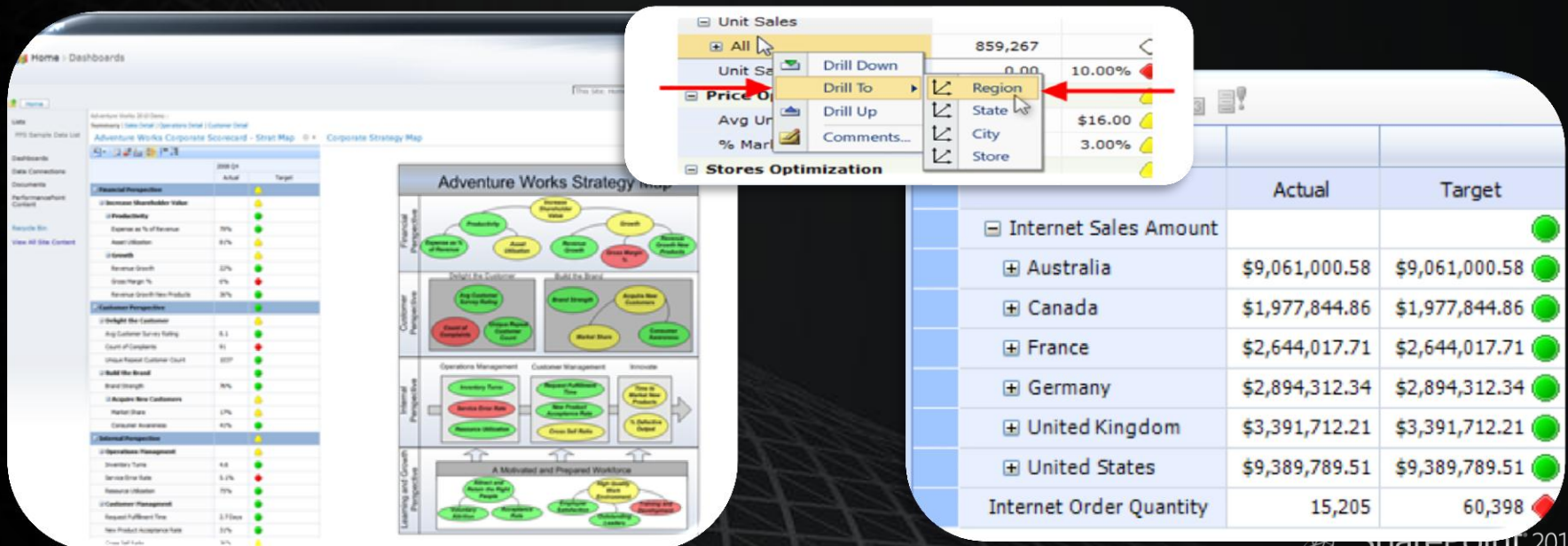
# What are Dashboards?

- Visual displays of information needed to achieve one or more objectives\*
- Single-Screen display of information to keep in touch with...
- Should answer fundamental questions
- Alert the user to issues or problems
- Operational, Performance, Personal



# What are Scorecards?

- Elements of a dashboard
- Align strategies and organizational goals
- Measure and manage Key Performance Indicators (KPI)
- Modeled after the business, not the data



# Designing PPS Applications

- Dashboard designer used to create content
  - ClickOnce application launched from browser
  - Manages content directly in SharePoint
    - Lists for content, data sources, dashboards

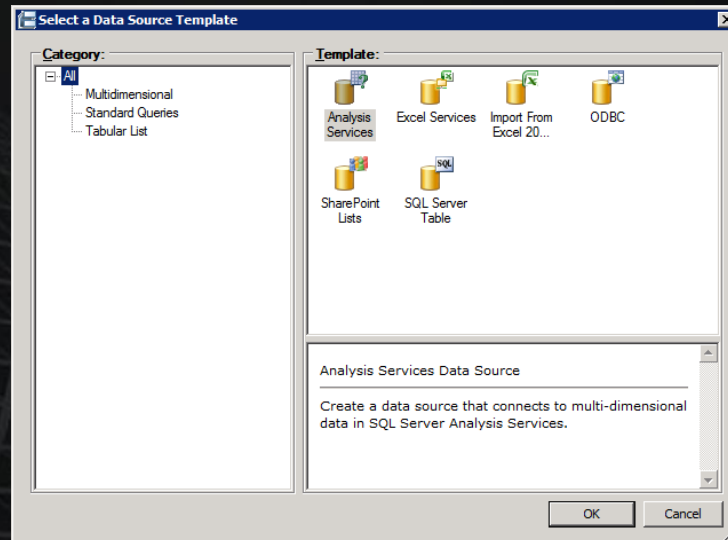
The image displays the Dashboard Designer application interface. On the left, a sidebar contains a link "View the samples, or get started now..." and a button "Run Dashboard Designer". The main workspace shows a dashboard titled "Product by Territory (Sales Quantity)" with a stacked bar chart. A yellow arrow points from the "Run Dashboard Designer" button to the dashboard. On the right, a "Dashboard Content" table lists various items:

Name	Type	Description	Person ...	Modified	Modifie...
PPS - HOL	Folder				
Dashboard	Folder				
PPS - ...	Dashboard			6/3/200...	WINGTI...
Filters	Folder				
Geogr...	Member ...			6/3/200...	WINGTI...
TI Filter	Time Int...			6/3/200...	WINGTI...
KPI's	Folder				
Perfor...	KPI			6/3/200...	WINGTI...
Reports	Folder				
Produ...	Folder				
Ac... Analytic ...				6/3/200...	WINGTI...
Bi... Analytic ...				6/3/200...	WINGTI...
Cl... Analytic ...				6/3/200...	WINGTI...
C... Analytic ...				6/3/200...	WINGTI...

At the bottom, a status bar indicates "Connected to: http://wingtipserver:47666/sites/BI".

# Aggregating Data Sources

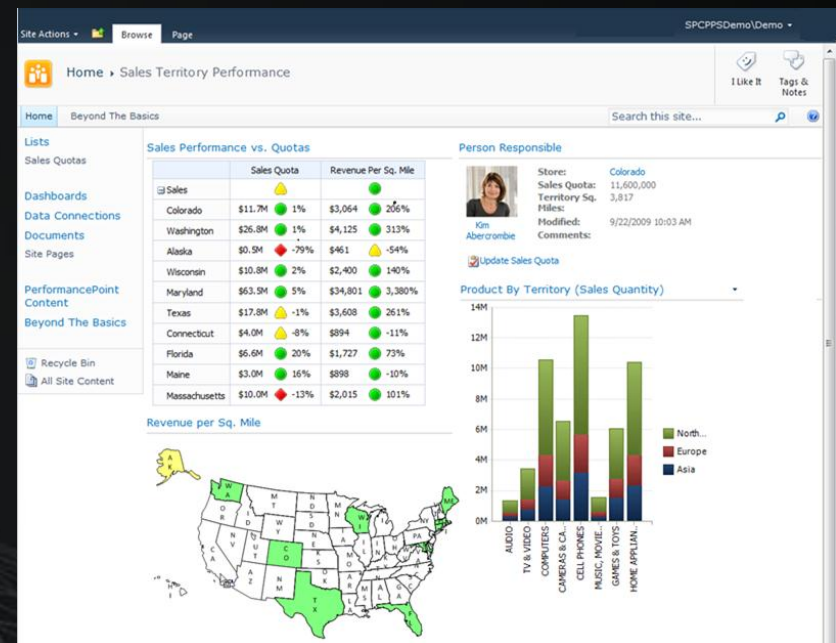
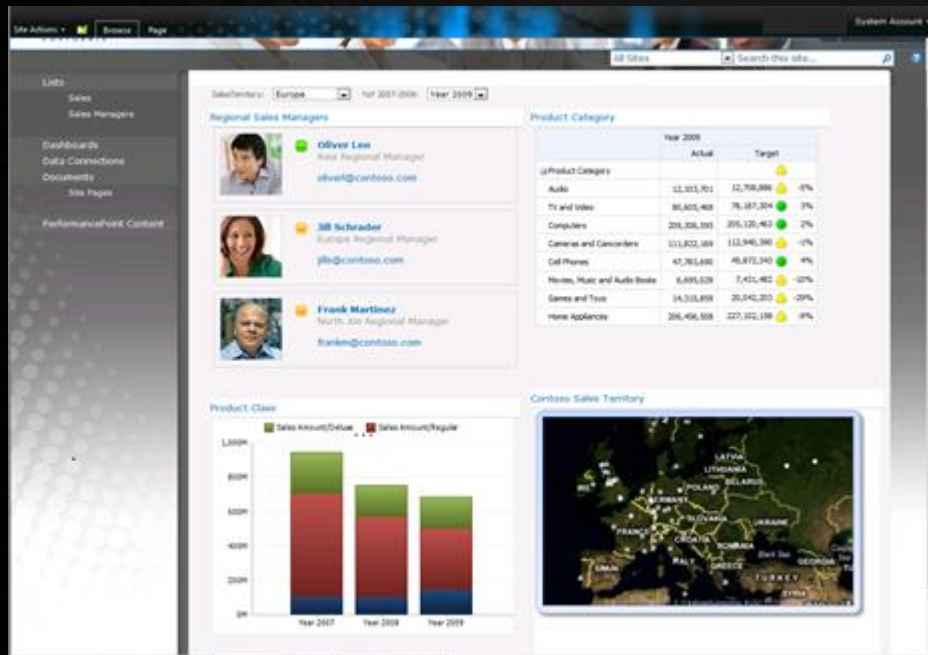
- Data access is managed with Data Sources
  - Data is accessible from multiple sources
    - Analysis Services, SQL Server, Excel Services, PowerPivot and SharePoint lists
  - Accessed with service account or current user
  - Stored in list as an XML file (\*.ppsd)





# PPS Content in the Browser

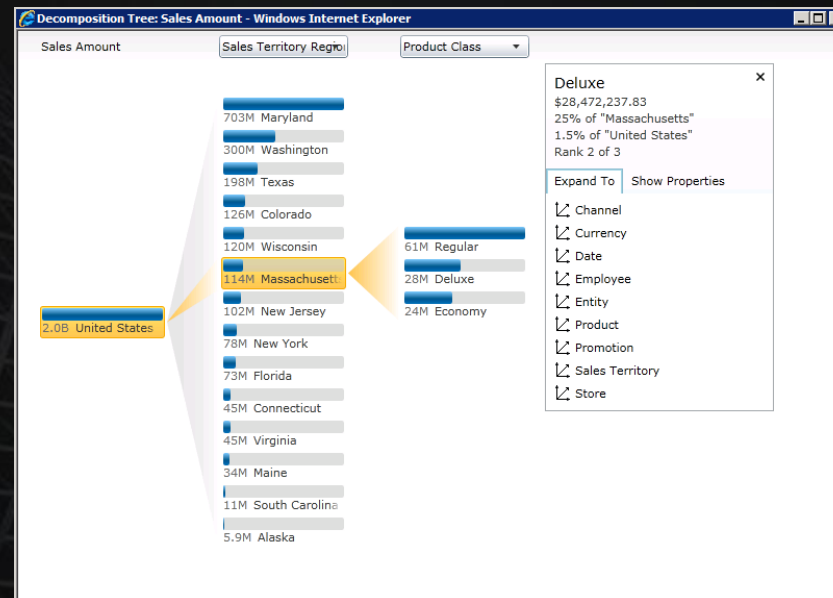
- Business users view content in the browser
  - Stored as Web Part pages
  - Web Part connections used to relate content
    - Ex. Item choice in a scorecard updates reports





# Visual Data Exploration

- Decomposition trees allow data exploration
  - New in SharePoint 2010
  - Available by right clicking data in browser
    - Analyze -> Decomposition Tree
  - Allows filtering\expanding across dimensions
  - Allows faster and more relevant visualization of data



# Development Scenarios

- Create Report, Filter, and Tabular Data Source Extensions
  - Report extensions, Filter extensions, data source extension, editor customizations
- Create Scorecard Transforms
  - Change the appearance, contents, or functionality of scorecards

# PerformancePoint Services

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*demo*

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# Summary

- Business Intelligence (BI) Primer
- BI Tools in SharePoint 2010
- Visio Services
- Excel Services
- PerformancePoint Services

# Q&A



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*Your potential. Our passion.™*

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