



Technical Forum & Executive Briefing

17 al 21
Octubre
2011

Imagine **PODER** Imagine **CAPACIDAD**

Intelligent Business Using DB2 for i



- Senior Consultant with the DB2 for i Center of Excellence
 - Part of IBM STG Lab Services and Training team
 - Provide consulting, education, and implementation services around DB2 for i
- 30 years experience on AS/400, iSeries, System i and DB2 for i
 - I/O Processor developer for S/38 and AS/400
 - Systems Engineer
 - Business Intelligence Sales Specialist
 - WW Sales Executive
 - Product Marketing Manager

The Agenda

- Business Intelligence
- Architectural Considerations

Today's Mid-market BI Landscape

- Business Intelligence Remains HOT
 - BI ranked #1 four straight years in Gartner CIO survey of top priorities
 - BI ranks #1 in Aberdeen Group study of technologies with the most business impact in the next 2-5 years

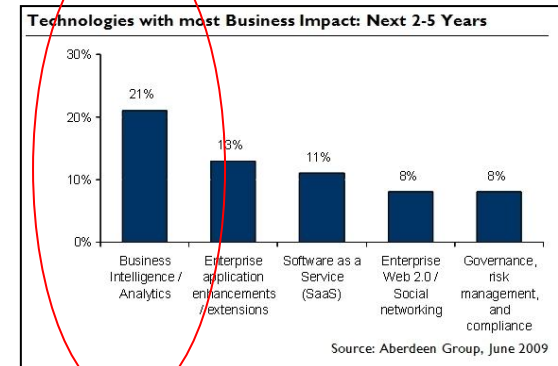
Figure 3. CIO Technology Priorities

Ranking of Technologies Selected by CIOs as One of Their Top Five Priorities in 2009

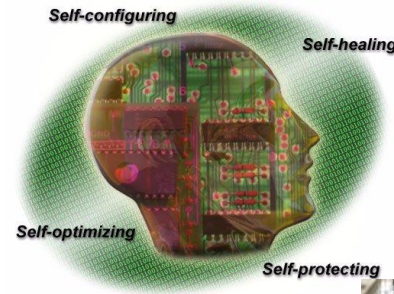
CIO Technologies	2009	2008	2007	2006
BI	1	1	1	1
Enterprise applications (ERP, SCM and CRM)	2	2	2	*
Server and storage technologies (virtualization)	3	3	5	8
Legacy application modernization	4	4	3	10
Collaboration technologies	5	8	10	4
Networking, voice and data communications	6	7	4	8
Technical infrastructure	7	6	8	12
Security technologies	8	5	6	2
Service-oriented applications and architecture	9	10	7	6
Document management	10	9	9	*

*Item was not included this year.
 SCM = supply chain management
 Source: Gartner (March 2009)

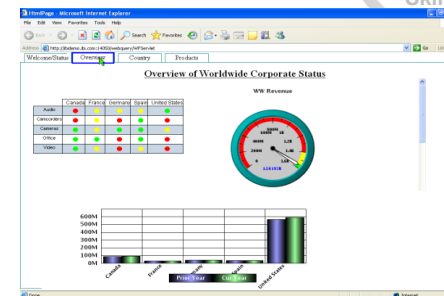
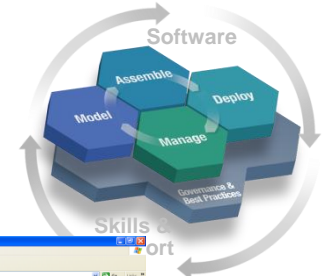
- Mid-market companies have similar requirements but have different abilities to execute:
 - Budget is smaller
 - Staff is limited– Admin, DBAs
 - *“The full capabilities of most BI tools are overkill for the typical SMB (Small and Medium Business).”*
 - Aberdeen Group



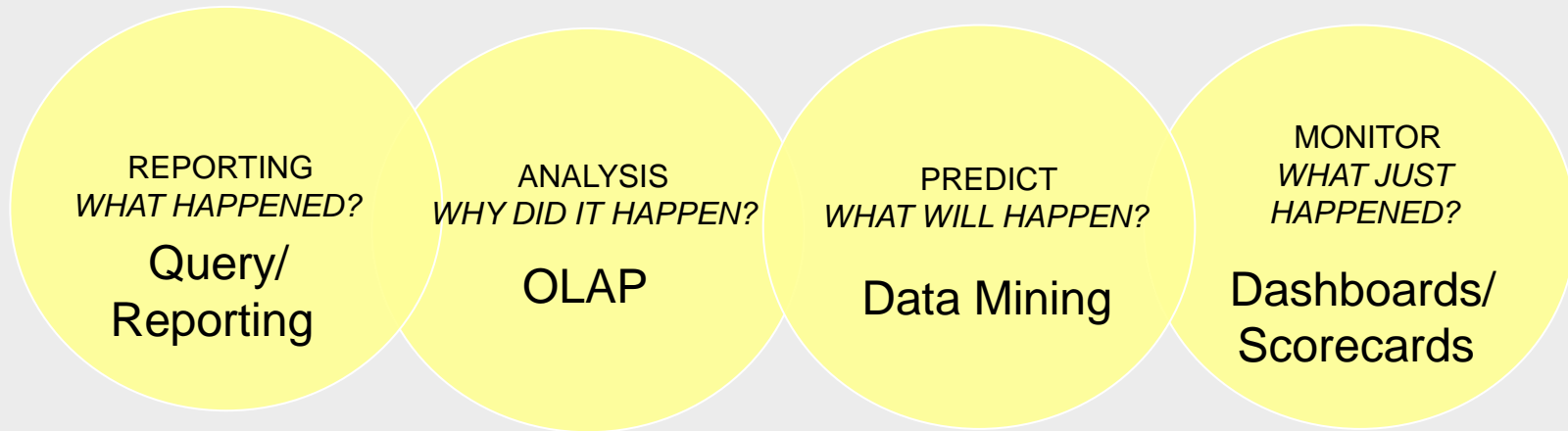
- **The Self Managing Database**
 - Reduced TCO thru automation
 - Integration: Built-in Security and Auditing
- **Trusted Reliability & Scalability**
 - Simplified, best of breed scaling
 - Integrated transaction management
 - Advanced, flexible logging facilities
- **Open for Business**
 - SQL, the strategic interface
 - Latest de facto standards
- **Innovative Applications**
 - SQL & Data-centric programming
 - Move to SOA over time
- **Business Intelligence**
 - Store, manage, and ANALYZE data!
 - End user query and reporting to large scale data warehousing



IBM SOA Foundation



What is Business Intelligence?



Historical Data (Data Warehouses/Marts)

Real-Time Data (ODS)

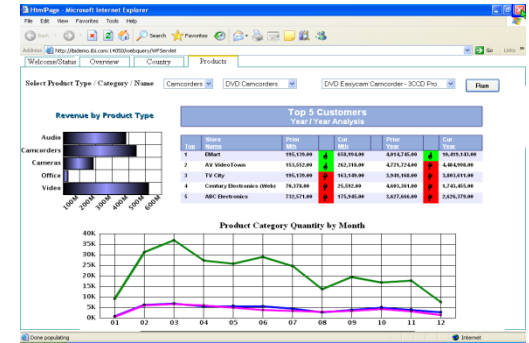
Trending/OLAP

Data Mining
(Predictive Analytics)

Business Performance
Management

DB2 Web Query for i

- Leverage the latest query optimization technology
- Value Licensing for existing Query/400 clients
- Keep data in the database DB2 for i
- Capitalize on the analytical capabilities



- Easily spot trends or exceptions in data with real time reports*
- Give Executives the means to track how the business is performing through intuitive Key Performance Indicator dashboards*
- Create self-service reporting environment that eliminates dependency on I/T*
- Provide data to spreadsheet aficionados painlessly and in real time*
- Execute and distribute reports in many different formats - on demand or scheduled – via e-mail or saved for later view*
- Integrate reports into existing applications for seamless access to data*

DB2 Web Query for i – Intuitive, Insightful, Extensible

Fast, easy access to business information assets for query, reporting and analysis

Power Systems

InfoAssist
WebFOCUS - Version 7.7.01

Getting Started

- Build a Report
- Build a Chart
- Build a Document
- Open Existing Item
- Change Default Options

Help

- InfoAssist Help
- Online Forum

Authoring Tool
"Intuitive"

Reports & Graphs
"Flexible delivery"

ORDERDATE_QUARTER	Product Category	Quantity	GrossProfit	Revenue
1	Amplifiers/Tweakers/Tuners	514947	\$2,431,963.00	\$6,009,853.00
	Audio Systems	514705	\$7,597,045.00	\$22,994,795.00
	CD Players and Recorders	513903	\$3,075,997.00	\$10,202,997.00
	Digital Cameras	542382	\$8,044,696.00	\$29,312,977.00
	DVD	56543	\$844,047.00	\$1,635,737.00
	DVD Camcorders	549144	\$14,196,556.00	\$57,571,056.00
	Handheld aud. dev.	538176	\$11,983,414.00	\$56,898,114.00

SALES KPI

5-day weather forecast for Rochester, MN

Date	Day of Week	High Temp	Low Temp	Forecast
03/14/11	Monday	37	27	Mostly Sunny
03/15/11	Tuesday	42	29	Chance Rain
03/16/11	Wednesday	52	30	Slight Chance Rain
03/17/11	Thursday	50	33	Chance Rain
03/18/11	Friday	48	25	Mostly Sunny

Gross Profit Margin by Region

Top 5 Sales Reps

RANK	SALESPERSON	Revenue
1	John	\$54,305,447
2	Ann	\$52,396,308
3	Sam	\$48,662,118
4	Mark	\$48,738,229
5	Dea	\$48,448,842

Store Revenue Y/Y

Store Name	Cur Yr Revenue	Prior Yr Revenue	Y/Y Rev
Audio Expert	176,860,343.00	176,429,357.00	9%
Audio Express	132,646,966.00	122,616,520.00	7%
TV City	93,225,538.00	88,893,213.00	7%
TV City	75,475,326.00	83,454,727.00	10%

Dashboards
"Insightful"

OLAP
"Extensible"

Product Name	Quantity	Revenue	Profit	Margin
Black HD TV with PC/DVD/TV inputs	1,887	\$3,017,313	\$564,213	18.70%
Black HD TV with PC/DVD/TV inputs	767	\$1,967,443	\$226,343	11.50%
Black Plasma Master TV	565	\$1,817,895	\$150,995	8.31%
Black Plasma Master TV	1,872	\$6,686,329	\$499,528	7.48%
Black HD AV Wireless Plasma TV	690	\$2,173,310	\$413,310	13.02%
Black HD TV with PC/DVD/TV inputs	598	\$994,202	\$178,802	18.70%
Black Plasma Master TV	133	\$346,667	\$29,767	11.50%
Black Plasma Master TV	72	\$259,128	\$21,528	8.31%
Black HD AV Wireless Plasma TV	940	\$3,359,160	\$251,160	7.48%
Black 20inch HDTV Master TV with DLP	109	\$501,291	\$65,291	13.02%
Black HD TV with PC/DVD/TV inputs	1,138	\$1,819,662	\$340,262	18.70%
Black HD TV with PC/DVD/TV inputs	559	\$1,478,831	\$170,131	11.50%
Black Plasma Master TV	292	\$992,577	\$66,677	8.31%
Black HD AV Wireless Plasma TV	1,817	\$6,066,483	\$453,283	11.50%
Black HD TV with PC/DVD/TV inputs	787	\$3,619,413	\$471,413	7.48%
Black Plasma Master TV	179	\$296,221	\$53,521	13.02%
Black HD AV Wireless Plasma TV	762	\$1,975,240	\$227,240	11.50%
Black HD AV Wireless Plasma TV	79	\$284,321	\$32,621	10.70%
Black 20inch HDTV Master TV with DLP	959	\$3,830,041	\$228,041	7.48%
Black HD TV with PC/DVD/TV inputs	174	\$1,444,086	\$188,086	13.02%
Black HD TV with PC/DVD/TV inputs	4,427	\$11,560,773	\$4,209,420	13.02%
Black Plasma Master TV	3,565	\$12,830,430	\$1,323,473	10.70%
Black HD AV Wireless Plasma TV	10,765	\$63,124,216	\$1,066,936	11.50%
			\$4,719,715	8.31%



It's more than just querying the data

- Not everyone understands the data
 - Hidden meanings and conditional rules...
 - 2nd character of column X means ..
 - if column Y = 'S', value Z must be multiplied by -1
 - If record type is '1', there *must* be a matching record in table B.
 - If type is '2, there *may* be a record.
 - If type is '3' there *should not* be a record.
 - For data older than 2/11/2003, column X will be blank – but it must be a valid value from then on.
- Not everyone understand the table/file relationships
 - How do I join these 8 files?
 - How do I more easily roll up data by city/region/country/world?
- Not everyone AGREES to the meaning of data
 - Accounting: $1+1 = 2$ Sales: $1+1 = 3$!
- This is where traditional reporting tools without a meta data layer fall short!

Leveraging a Meta Data Layer to Shield Complexities of Database

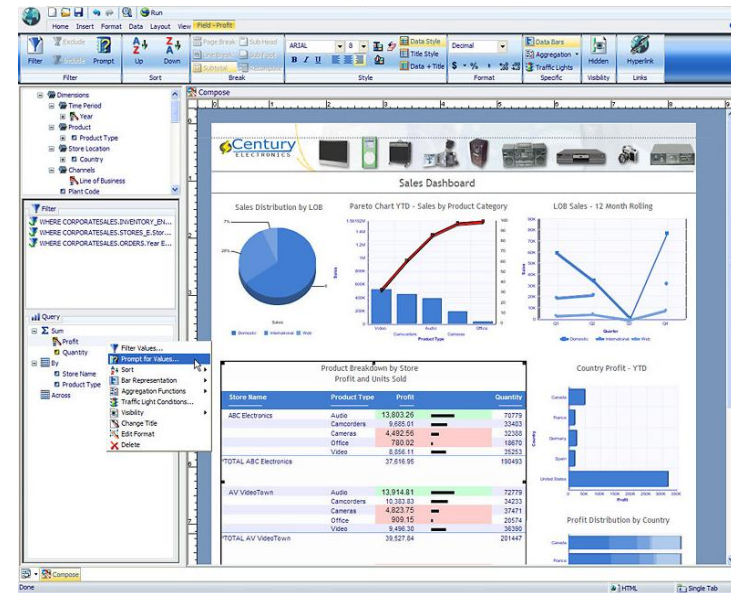
DB2 Web Query Allows you to:

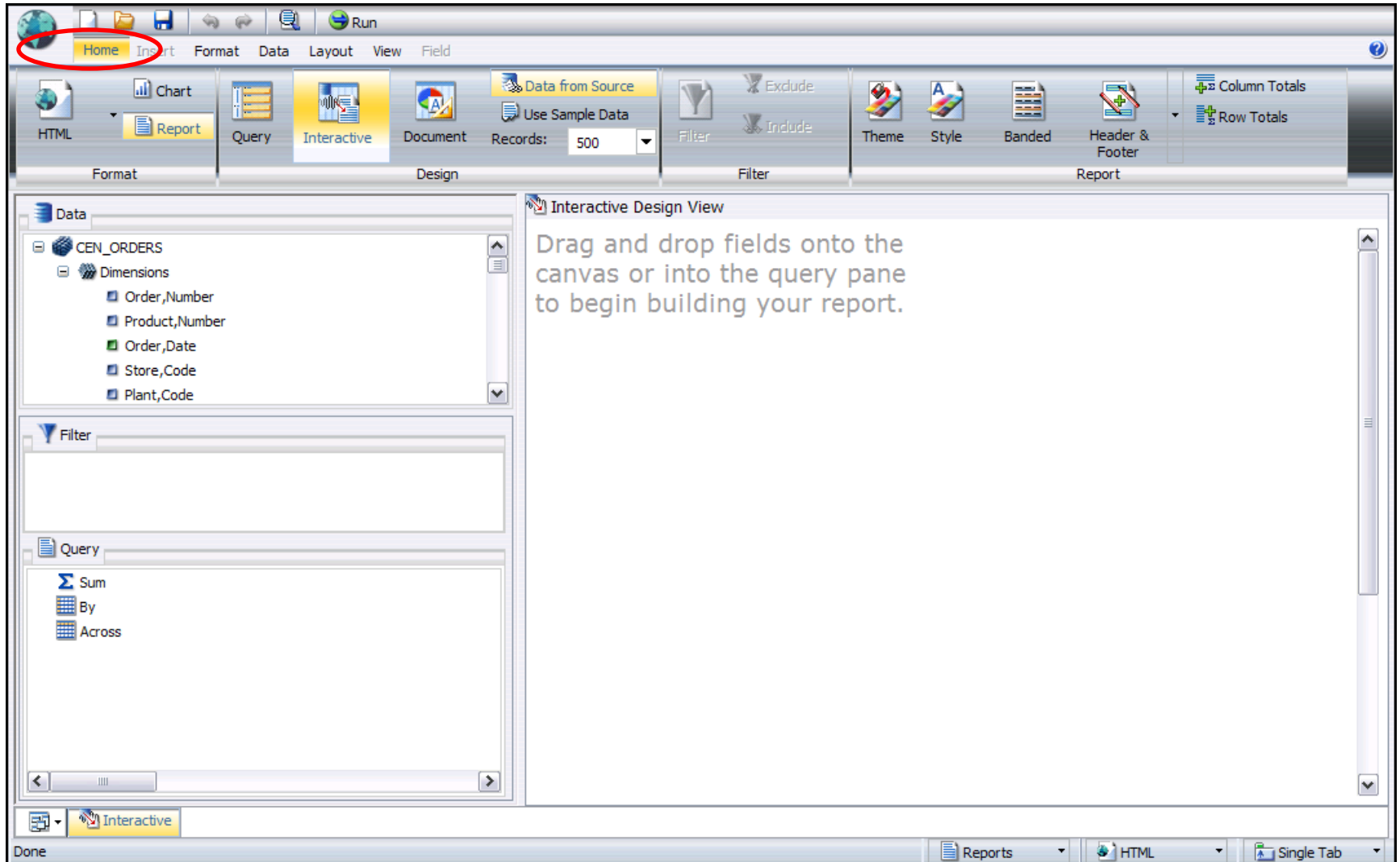
- Standardize Field/Column Formats
 - Ex, use commas, set currency symbol, suppress leading zeros
- Standardize/Decompose Date Fields
 - Ex: Integer defined as MMDDYYYY
- Create Filters
 - Ex: Define a set of countries as “Europe”
- Define JOINS
- Create Business Views
 - Organize Columns/fields for easier report development

The screenshot shows the DB2 Web Query interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Command', 'Window', and 'Help'. Below the menu bar is a toolbar with various icons. The main area is divided into two panes. The left pane, titled 'All Folders', shows a tree view of the file system structure, including 'Developer Studio Desktop', 'WebFOCUS Environments', 'DALI50Sa', 'Data Servers', 'EDASERVE', 'Applications', 'baseapp', 'Managed Reporting', and 'ibias4n'. The right pane, titled 'Contents of 'baseapp'', shows a list of files with columns for 'Name', 'Size', and 'Type'. The files listed are: 'cen_alerts.acx' (77 bytes, Access File), 'cen_alerts.mas' (309 bytes, Master File), 'cen_currate.acx' (81 bytes, Access File), 'cen_currate.mas' (253 bytes, Master File), 'cen_hr.acx' (69 bytes, Access File), 'cen_hr.mas' (1.04 KB, Master File), 'cen_inventory.acx' (88 bytes, Access File), 'cen_inventory.mas' (949 bytes, Master File), and 'cen_orders.acx' (630 bytes, Access File). Below the file explorer is a 'Join Properties' dialog box. It has two tabs: 'Left Source Columns' and 'Right Source Columns'. The 'Left Source Columns' tab is active, showing a table with columns 'Table', 'Source Column', 'Format', and 'Descrip'. The table contains 11 rows of data. The 'Right Source Columns' tab is also visible, showing a similar table with 8 rows. Below the columns are 'Join Type' and 'Join Conditions' sections. The 'Join Type' dropdown is set to 'Inner Join', and a Venn diagram shows two overlapping circles with the intersection shaded blue. The 'Join Conditions' section contains a single condition: '1 | ORDERS.PRODUCTNUMBER = CEN_INVENTORY.PRODUCTNUMBER'. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

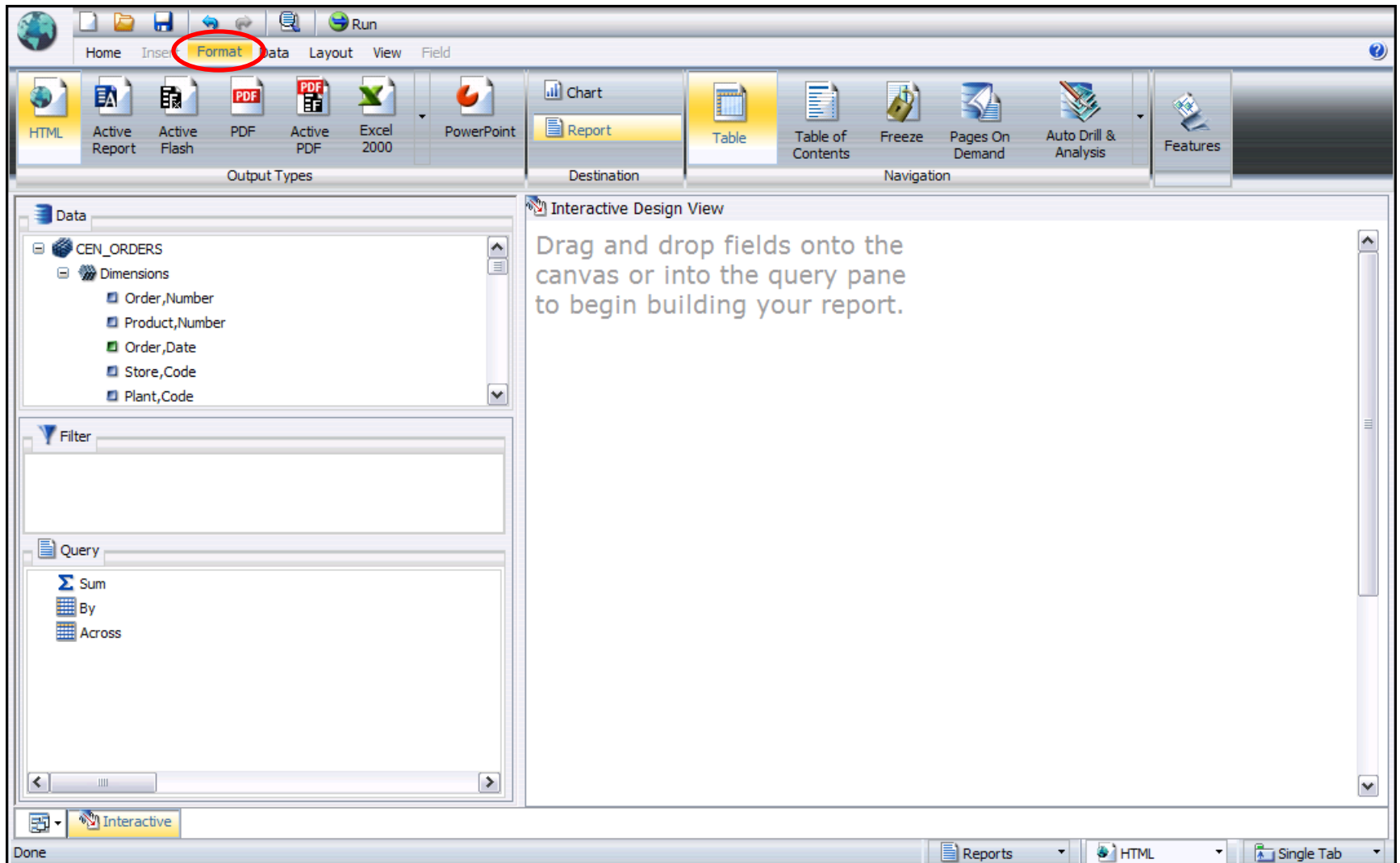
The “BASE” Product: InfoAssist

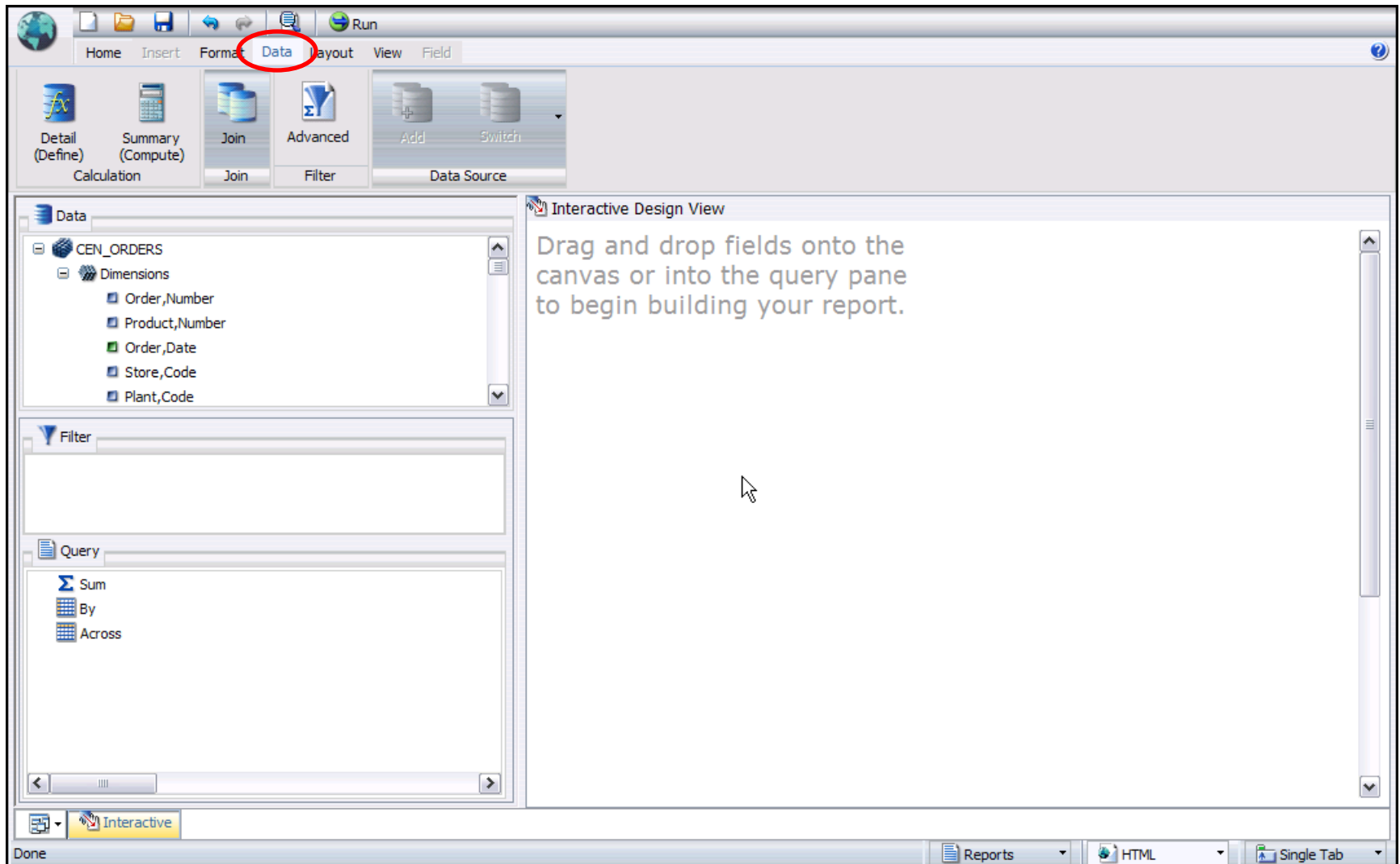
- Create simple queries, as well as highly complex reports, charts, and dashboards from multiple sources using simple Ribbon-like interface
- Convert reports to charts or charts to reports or analyze multiple reports and charts simultaneously, tiling them to view data from multiple perspectives
- Will extend “report author” community beyond just I/T personnel
- Only available with v1.1.2
 - Upgrade into 1.1.2 on 5.4 and up
 - DB2 Web Query SW Maintenance required





IBM DB2 Web Query for i – InfoAssist





The screenshot displays the IBM DB2 Web Query for i – InfoAssist interface. At the top, there is a navigation bar with tabs: Home, Insert, Format, Data, Layout, View, and Field. Below this is a toolbar with various icons for Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The main workspace is titled "Interactive Design View" and contains the instruction: "Drag and drop fields onto the canvas or into the query pane to begin building your report." On the left side, there are several panels: "Data" showing a tree view with "Model" and "Measures/Properties" (including Quantity, Revenue, Cost of, Goods Sold, Returns, and Warranty, Expenses); "Filter" with an empty input field; and "Query" with options for Sum, By, and Across. At the bottom, there is a status bar with "Done" and a taskbar showing "Reports", "HTML", and "Single Tab".

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. At the top, there is a ribbon menu with tabs: Home, Insert, Format, Data, Layout, View, and Field. Below the ribbon is a toolbar with various icons for filtering, sorting, and formatting. The main workspace is titled "Interactive Design View" and contains the instruction: "Drag and drop fields onto the canvas or into the query pane to begin building your report." A red arrow points from the "Revenue" field in the "Measures/Properties" list to the main canvas. On the left side, there are panels for "Data" (containing a tree view with "Model" and "Measures/Properties" sub-items), "Filter", and "Query" (containing "Sum", "By", and "Across" options). The bottom status bar shows "Done" and several open tabs: "Reports", "HTML", and "Single Tab".

IBM DB2 Web Query for i – InfoAssist

The screenshot displays the IBM DB2 Web Query for i – InfoAssist interface. The top menu bar includes Home, Insert, Format, Data, Layout, View, and Field. The 'Field' menu is currently active, showing options like Filter, Exlude, Include, Prompt, Up, Down, Rank, Limit, Break, Style, Format, Specific, Visibility, and Links. The 'Up' option is highlighted. Below the menu bar, the 'Data' pane on the left shows a tree view with 'Model' expanded to 'Measures/Properties', listing 'Quantity', 'Revenue', 'Cost of, Goods Sold', 'Returns', and 'Warranty, Expenses'. A red arrow points from 'Revenue' to the 'Query' section below. The 'Query' section shows 'Sum', 'By', and 'Across' options. The main 'Interactive Design View' area contains the text: 'Drag and drop fields onto the canvas or into the query pane to begin building your report.' The bottom status bar shows 'Done' and 'Interactive' mode. The taskbar at the very bottom shows 'Reports', 'HTML', and 'Single Tab' tabs.

IBM DB2 Web Query for i – InfoAssist

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. The top menu bar includes Home, Insert, Format, Data, Layout, View, and Field. The ribbon below the menu has sections for Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The left sidebar contains sections for Data, Filter, and Query. The main area is titled 'Interactive Design View' and shows a summary of Revenue with a value of 25806424.00. The bottom status bar shows 'Done' and several tabs: Reports, HTML, and Single Tab.

Revenue
25806424.00

Done | Reports | HTML | Single Tab

IBM DB2 Web Query for i – InfoAssist

The screenshot displays the IBM DB2 Web Query for i – InfoAssist interface. The top menu bar includes Home, Insert, Format, Data, Layout, View, and Field. The Field menu is active, showing options like Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The Sort menu is also active, showing options like Up, Down, Rank, and Limit. The Data pane on the left shows a list of fields: Store,Code, Plant,Code, Store,Code, Store,Name, Country, Region, and State. The Filter pane is empty. The Query pane shows a Sum of Revenue by Across. The Interactive Design View shows a table with one row: Revenue, 25806424.00. The status bar at the bottom shows Done, Reports, HTML, and Single Tab.

Revenue
25806424.00

IBM DB2 Web Query for i – InfoAssist

The screenshot displays the IBM DB2 Web Query for i – InfoAssist interface. The top navigation bar includes tabs for Home, Insert, Format, Data, Layout, View, and Field. The Field tab is active, showing options for Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The Sort section is expanded, showing 'Up' and 'Down' buttons, a 'Rank' dropdown set to 'No Limit', and a 'Limit' dropdown. The main workspace is titled 'Interactive Design View' and shows a query result for 'Revenue' with a value of 25806424.00. A red arrow points from the 'Revenue' field in the query editor to the result value. The query editor shows a 'Sum' function applied to the 'Revenue' field, grouped by 'By' and 'Across'. The bottom status bar shows 'Done' and 'Interactive' mode.

Revenue
25806424.00

IBM DB2 Web Query for i – InfoAssist

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. The top navigation bar includes tabs for Home, Insert, Format, Data, Layout, View, and Field. The 'Field' tab is active, showing a toolbar with options like Filter, Exlude, Include, Prompt, Sort (Up, Down, Rank, Limit), Break, Style, Format, Specific, Visibility, and Links. The 'Data' pane on the left lists fields such as Store,Code, Plant,Code, Store,Code, Store,Name, Country, Region, and State. The 'Filter' and 'Query' panes are also visible. The main 'Interactive Design View' displays a table with the following data:

Country	Revenue
Canada	3035473.00
France	429768.00
Spain	2588263.00
United States	10443142.00

The bottom status bar shows 'Done' and active tabs for Reports, HTML, and Single Tab.

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. The top navigation bar includes tabs for Home, Insert, Format, Data, Layout, View, and Field. The 'Field' tab is active, showing a toolbar with options like Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The 'Sort' section is expanded, showing 'Up', 'Down', 'Rank', and 'Limit' options. The 'Data' pane on the left shows a tree view with 'Product Type', 'Product Category', 'Product Name', 'Model', and 'Measures/Properties' (Quantity, Revenue). The 'Query' pane shows a query configuration: Sum of Revenue by Country Across. The main 'Interactive Design View' displays a table with the following data:

Country	Revenue
Canada	3035473.00
France	429768.00
Spain	2588263.00
United States	10443142.00

The bottom status bar shows 'Done' and active tabs for 'Reports', 'HTML', and 'Single Tab'.

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. The top navigation bar includes tabs for Home, Insert, Format, Data, Layout, View, and Field. The 'Field' tab is active, showing a ribbon with options like Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The 'Sort' ribbon is expanded, showing 'Up', 'Down', 'Rank', and 'Limit' options. A large red arrow points from the 'Up' button to the 'Country' field in the query configuration pane.

The left pane shows the 'Data' section with a tree view of fields: Product Type, Product Category, Product Name, Model, Measures/Properties, Quantity, and Revenue. Below this is the 'Filter' section and the 'Query' section, which is configured with 'Sum' of 'Revenue' grouped 'By' 'Country' and 'Across'.

The main area displays the 'Interactive Design View' of the query results as a table:

Country	Revenue
Canada	3035473.00
France	429768.00
Spain	2588263.00
United States	10443142.00

The bottom status bar shows 'Done' and several open tabs: Reports, HTML, and Single Tab.

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. The top navigation bar includes Home, Insert, Format, Data, Layout, View, and Field. The 'Field' menu is currently active, showing options like Filter, Sort, Break, Style, Format, Specific, Visibility, and Links. The 'Sort' sub-menu is expanded, showing 'Up', 'Down', 'Rank', and 'Limit' options. The 'Data' pane on the left shows a tree view of fields including Product Type, Product Category, Product Name, Model, Measures/Properties (Quantity, Revenue), and Filter. The 'Query' pane shows a query configuration with 'Sum' of 'Revenue' grouped 'By' 'Country' and 'Across' 'Product Type'. The main 'Interactive Design View' displays a table with the following data:

Country	Product Type				
	Audio	Camcorders	Cameras	Office	Video
Canada	44074.00	248625.00	536241.00	27132.00	2179401.00
Spain	1304016.00	.	.	.	731357.00
United States	1960240.00	2956281.00	883925.00	148695.00	2056492.00

The bottom status bar shows 'Done' and active tabs for 'Reports', 'HTML', and 'Single Tab'.

IBM DB2 Web Query for i – InfoAssist

Power Systems

The screenshot displays the IBM DB2 Web Query for i – InfoAssist interface. The top menu bar includes Home, Insert, Format, Data, and Layout. The 'Run' button is highlighted, with a tooltip showing 'Run report [Ctrl+R]'. The ribbon contains various options: Filter (Exclude, Include, Prompt), Sort (Up, Down, Rank, Limit), Break, Style, Format, Specific, Visibility, and Links. The left sidebar shows the 'Data' tree with fields like Product Type, Product Category, Product Name, Model, Measures/Properties (Quantity, Revenue), and Filter. The 'Query' section shows a Sum of Revenue by Country across Product Type. The main report area, titled 'Report1[0]', displays a table with the following data:

Country	Product Type				
	Audio	Camcorders	Cameras	Office	Video
Canada	43897329.00	53450922.00	20943882.00	2858441.00	60563472.00
France	16817832.00	19806592.00	8138513.00	1338048.00	19381067.00
Germany	20850439.00	24332946.00	9601694.00	1841043.00	29582533.00
Spain	16458158.00	21066201.00	6149115.00	1670051.00	24134124.00
United States	284659563.00	325874380.00	139270463.00	22538102.00	386699009.00

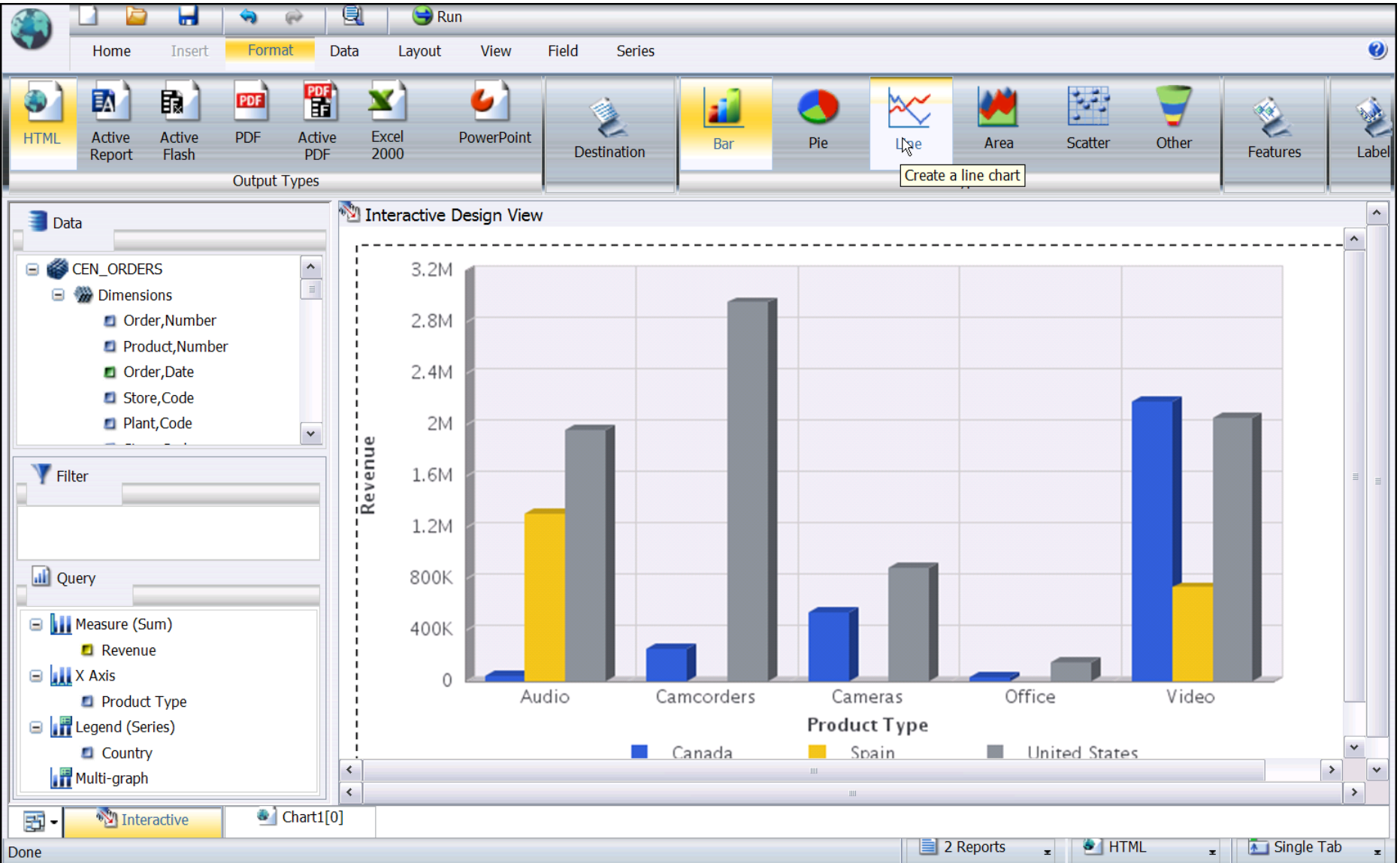
The bottom status bar shows 'Done', 'Interactive', and 'Report1[0]'. The taskbar at the very bottom includes 'Reports', 'HTML', and 'Single Tab'.

The screenshot displays the IBM DB2 Web Query for i InfoAssist interface. The top menu bar includes Home, Insert, Format, Data, Layout, View, and Field. The ribbon contains several groups: Output Types (HTML, Active Report, Active Flash, PDF, Active PDF, Excel 2000, PowerPoint), Destination (Chart, Report), Table, Table of Contents, Navigation (Freeze, Pages On Demand, Auto Drill & Analysis), and Features. A left-hand pane shows a Data tree with Product Type, Product Category, Product Name, Model, Measures/Properties (Quantity, Revenue), Filter, and Query sections. The main report window, titled 'Report1[0]', displays a table with the following data:

Country	Product Type				
	Audio	Camcorders	Cameras	Office	Video
Canada	43897329.00	53450922.00	20943882.00	2858441.00	60563472.00
France	16817832.00	19806592.00	8138513.00	1338048.00	19381067.00
Germany	20850439.00	24332946.00	9601694.00	1841043.00	29582533.00
Spain	16458158.00	21066201.00	6149115.00	1670051.00	24134124.00
United States	284659563.00	325874380.00	139270463.00	22538102.00	386699009.00

The bottom status bar shows 'Done', 'Interactive', 'Report1[0]', 'Reports', 'HTML', and 'Single Tab'.

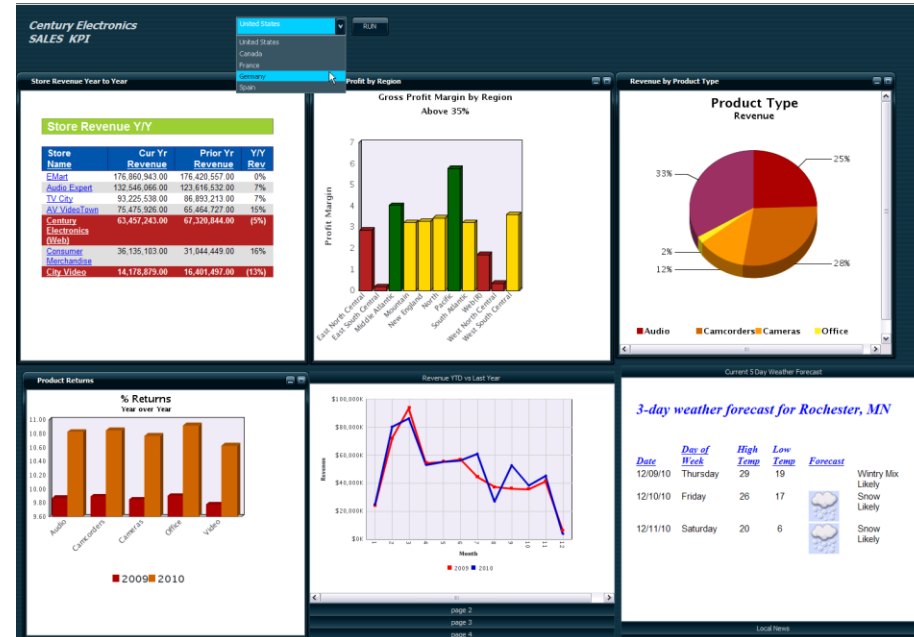
IBM DB2 Web Query for i – InfoAssist



DB2 Web Query Rich Internet Application Dashboards

Power Systems

- Look and feel of fat client application on a zero footprint client
- Leverage HTML Composer component of Developer Workbench
- Build KPI (Key Performance Indicator) view of the business for executives
 - Layout multiple KPIs onto single view
 - Link reports to common parameter
 - Example: allow end user to select geography of interest and all charts automatically reflect selection
- No programming required



Empower End Users with On Line Analytical Processing

- With the OLAP feature you can replace 10's of Query/400 reports with a SINGLE DB2 Web Query report
- A single report is a starting point for interactive, real time multi-dimensional data analysis
 - Drill down
 - Add or remove fields/columns by dragging and dropping
 - Pivot rows and columns
 - Navigate across any dimension
 - Create charts from navigation point
 - Save report based on navigation point
- Requires Developer Workbench license to define dimensions and measurements
 - No CUBES Required
 - No data duplication required

Product Type	Product Category	Line Total	Cost of Goods Sold	Gross Profit
Audio	Amplifiers/PreAmps/Tuners	\$42,374,428	\$25,739,570	\$42,011,058
	Audio Systems	\$122,345,680	\$82,282,820	\$121,004,220
	CD Players and Recorders	\$53,847,459	\$37,638,460	\$53,200,739
	MP3	\$43,491,588	\$26,438,660	\$43,090,478
	Receivers	\$35,907,113	\$22,998,000	\$35,555,263
Camcorders	Speakers	\$84,717,053	\$24,680,990	\$84,373,233
	Digital Camcorders	\$13,614,953	\$8,512,600	\$13,536,923
	DVD Camcorders	\$379,376,637	\$300,373,360	\$375,144,437
Cameras	MiniDV Camcorders	\$51,539,451	\$34,128,360	\$50,991,761
	Digital Cameras	\$184,103,667	\$133,328,830	\$182,200,567
Office	Handheld and PDA	\$18,533,190	\$14,067,420	\$18,374,880
	Organizers	\$11,712,495	\$4,957,305	\$11,655,940
Video	DVD	\$329,872,045	\$248,768,900	\$326,179,845
	TV	\$168,798,539	\$150,771,700	\$166,628,939
	VCR	\$21,688,621	\$16,270,950	\$21,463,121
TOTAL		\$1,561,923,919	\$1,129,157,915	\$1,545,410,404

OLAP Analysis

Measures Graph

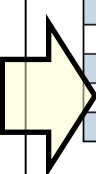
Time Period Product Location

Product Type:

Product Category:

Product Name:

<input type="checkbox"/> Product Category	<input type="text"/> Quantity	<input type="text"/> Revenue	<input type="text"/> Cost of Goods Sold	<input type="text"/> Returns	<input type="text"/> Profit	<input type="text"/> Margin
Amplifiers/PreAmps/Tuners	109,422	\$42,374,428	25,739,570.00	11,356	\$16,634,858	39.26%
Audio Systems	86,020	\$122,345,680	82,282,820.00	8,721	\$40,062,860	32.75%
CD Players and Recorders	82,641	\$53,847,459	37,838,460.00	8,294	\$16,008,999	29.73%
Digital Cameras	383,843	\$184,103,667	133,328,830.00	38,980	\$50,774,837	27.58%
Digital8 Camcorders	55,057	\$13,614,953	6,512,600.00	5,639	\$7,102,353	52.17%
DVD	294,955	\$329,872,045	248,768,900.00	29,849	\$81,103,145	24.59%
DVD Camcorders	260,133	\$379,376,637	300,373,350.00	26,326	\$79,003,287	20.82%
Handheld and PDA	60,810	\$18,533,190	14,067,420.00	6,216	\$4,465,770	24.10%
MiniDV Camcorders	48,449	\$51,539,451	34,128,360.00	5,149	\$17,411,091	33.78%
MP3	216,042	\$43,491,588	26,438,660.00	21,793	\$17,052,928	39.21%
Organizers	199,765	\$11,712,495	4,957,305.00	20,483	\$6,755,190	57.68%
Receivers	87,377	\$35,907,113	22,998,000.00	8,997	\$12,909,113	35.95%
Speakers	281,337	\$84,717,053	24,680,990.00	28,794	\$60,036,063	70.87%
TV	55,261	\$168,799,539	150,771,700.00	5,554	\$18,027,839	10.68%
VCR	65,469	\$21,688,621	16,270,950.00	6,487	\$5,417,671	24.98%



OLAP Analysis

Measures | Graph | Time Period | Product | Location

Product Type: --All-- | Product Category: TV | Product Name: --All--

OLAP | Run | Reset | Save | Help

<input type="checkbox"/> Product Name	<input type="checkbox"/> Quantity	<input type="checkbox"/> Revenue	Cost of <input type="checkbox"/> Goods Sold	<input type="checkbox"/> Returns	<input type="checkbox"/> Profit	<input type="checkbox"/> Margin
20 Inch LCD TV with PC/DVD/TV Inputs	18,382	\$29,392,818	23,896,600.00	1,877	\$5,496,218	18.70%
30 Inch LCD TV with PC/DVD/TV Inputs	6,646	\$17,272,954	15,285,800.00	659	\$1,987,154	11.50%
42 Inch Plasma Monitor/TV	4,444	\$15,993,956	14,665,200.00	427	\$1,328,756	8.31%
50 Inch HD A/V Wireless Plasma TV	20,773	\$83,071,227	76,860,100.00	2,110	\$6,211,127	7.48%
56 Inch Widescreen HDTV Monitor TV with DLP	5,016	\$23,068,584	20,064,000.00	481	\$3,004,584	13.02%

OLAP Analysis

Measures Graph Time Period Product Location

Country = --All-- Region = --All-- State = --All-- City = --All-- Store Name = --All--

OLAP Run Reset Save Help

Product Name	Quantity	Revenue	Cost of Goods Sold	Returns	Profit	Margin
20 Inch LCD TV with PC/DVD/TV Inputs	18,382	\$29,392,818	23,896,600.00	1,877	\$5,496,218	18.70%
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OLAP Analysis

Measures Graph Time Period Product Location

Country Region State City Store Name

--All-- --All-- --All-- --All-- --All--

OLAP Run Reset Save Help



Country	Product Name	Quantity	Revenue	Profit	Margin
Canada	20 Inch LCD TV with PC/DVD/TV Inputs	1,887	\$3,017,313	\$564,213	18.70%
	30 Inch LCD TV with PC/DVD/TV Inputs	757	\$1,967,443	\$226,343	11.50%
	42 Inch Plasma Monitor/TV	505	\$1,817,495	\$150,995	8.31%
	50 Inch HD A/V Wireless Plasma TV	1,672	\$6,686,328	\$499,928	7.48%
	56 Inch Widescreen HDTV Monitor TV with DLP	690	\$3,173,310	\$413,310	13.02%
France	20 Inch LCD TV with PC/DVD/TV Inputs	598	\$956,202	\$178,802	18.70%
	30 Inch LCD TV with PC/DVD/TV Inputs	133	\$345,667	\$39,767	11.50%
	42 Inch Plasma Monitor/TV	72	\$259,128	\$21,528	8.31%
	50 Inch HD A/V Wireless Plasma TV	840	\$3,359,160	\$251,160	7.48%
	56 Inch Widescreen HDTV Monitor TV with DLP	109	\$501,291	\$65,291	13.02%
Germany	20 Inch LCD TV with PC/DVD/TV Inputs	1,138	\$1,819,662	\$340,262	18.70%
	30 Inch LCD TV with PC/DVD/TV Inputs	569	\$1,478,831	\$170,131	11.50%
	42 Inch Plasma Monitor/TV	223	\$802,577	\$66,677	8.31%
	50 Inch HD A/V Wireless Plasma TV	1,517	\$6,066,483	\$453,583	7.48%
	56 Inch Widescreen HDTV Monitor TV with DLP	787	\$3,619,413	\$471,413	13.02%
Spain	20 Inch LCD TV with PC/DVD/TV Inputs	179	\$286,221	\$53,521	18.70%
	30 Inch LCD TV with PC/DVD/TV Inputs	760	\$1,975,240	\$227,240	11.50%
	42 Inch Plasma Monitor/TV	79	\$284,321	\$23,621	8.31%
	50 Inch HD A/V Wireless Plasma TV	959	\$3,835,041	\$286,741	7.48%
	56 Inch Widescreen HDTV Monitor TV with DLP	314	\$1,444,086	\$188,086	13.02%
United States	20 Inch LCD TV with PC/DVD/TV Inputs	14,580	\$23,313,420	\$4,359,420	18.70%
	30 Inch LCD TV with PC/DVD/TV Inputs	4,427	\$11,505,773	\$1,323,673	11.50%
	42 Inch Plasma Monitor/TV	3,565	\$12,830,435	\$1,065,935	8.31%
	50 Inch HD A/V Wireless Plasma TV	15,785	\$63,124,215	\$4,719,715	7.48%

OLAP Analysis

Measures Graph

Time Period Product Location

Country: United States (dropdown menu: France, Germany, Spain, United States)

Region: --All-- State: --All-- City: --All-- Store Name: --All--

OLAP Run Reset Save Help

Country	Product Name	Quantity	Revenue	Profit	Margin
Canada	20 Inch LCD TV with PC/DVD/TV Inputs	1,887	\$3,017,313	\$564,213	18.70%
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OLAP Analysis

Measures Graph

Time Period Product Location

Country: United States | Region: --All-- | State: --All-- | City: --All-- | Store Name: --All--

OLAP Run Reset Save Help


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United States	20 Inch LCD TV with PC/DVD/TV Inputs	14,580	\$23,313,420	\$4,359,420	18.70%
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	56 Inch Widescreen HDTV Monitor TV with DLP	3,116	\$14,330,484	\$1,866,484	13.02%






OLAP Analysis

Measures Graph Time Period Product Location

Country: United States Region: --All-- State: --All-- City: --All-- Store Name: --All--

OLAP Run Reset Save Help



Country	Product Name	Quantity	Revenue	Profit	Margin
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- Sort by Highest
- Sort by Lowest
- Graph
- Hide
- Unhide
- Remove Visualize
- Full Screen
- Help

OLAP Analysis

Measures Graph Time Period Product Location

Country: United States Region: --All-- State: --All-- City: --All-- Store Name: --All--

OLAP Run Reset Save Help

Country	Product Name	Quantity	Revenue	Profit	Margin
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OLAP Analysis



Measures | Graph

Time Period | Product | Location

Quantity

Revenue

Cost of Goods Sold

Returns

Profit

Margin

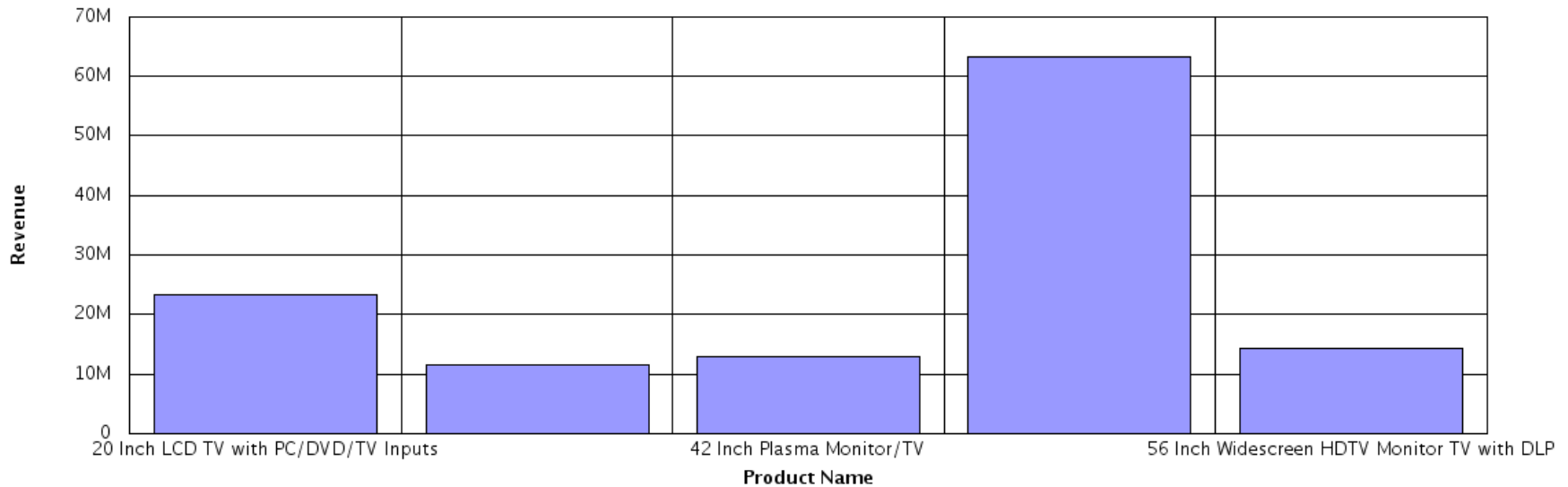
Ord_Qtr: --All-- | Ord_Mth: --All--

OLAP | Run | Reset | Save | Help

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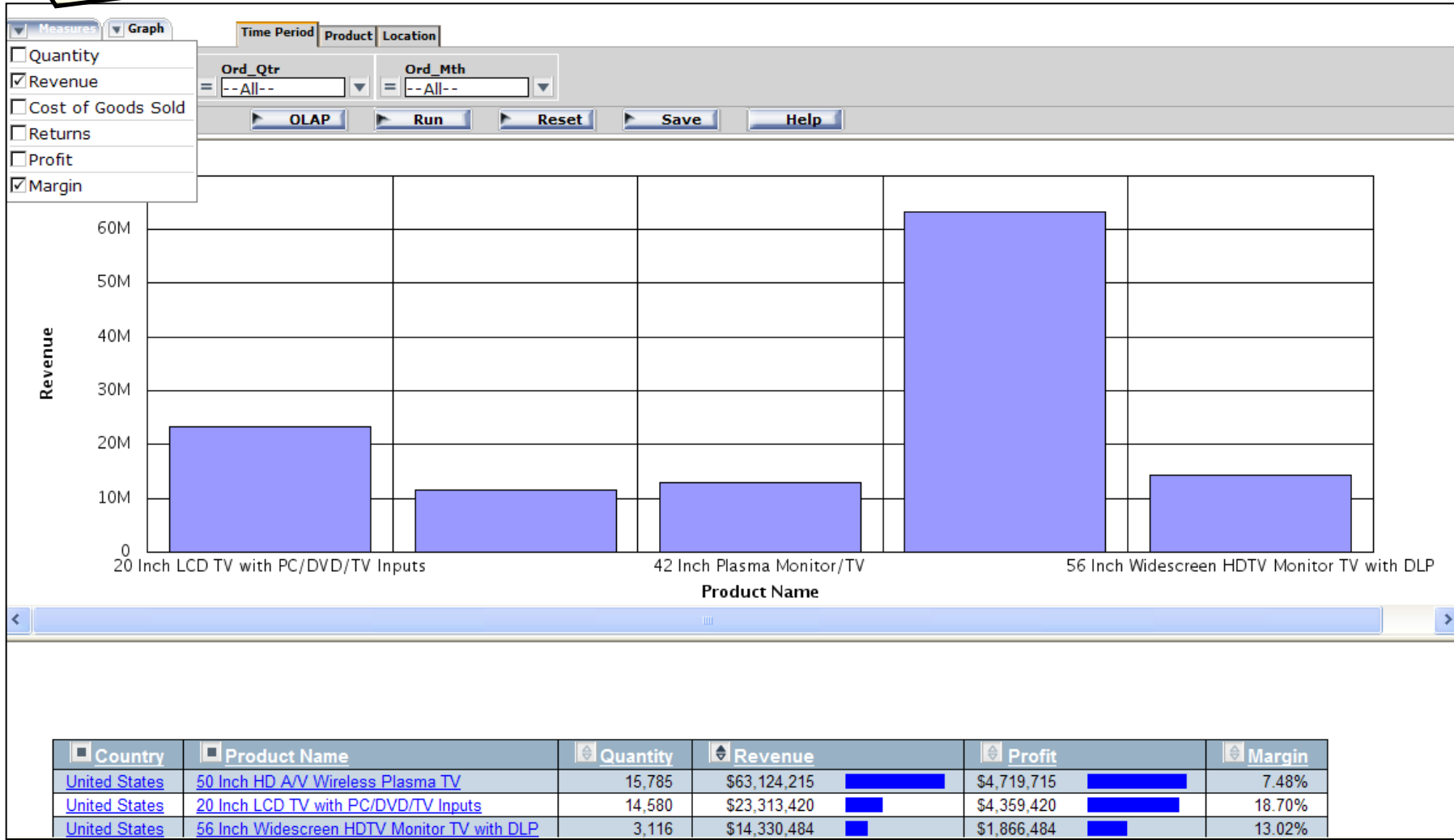
OLAP Analysis

Ord_Yr: --All-- Ord_Qtr: --All-- Ord_Mth: --All--



Country	Product Name	Quantity	Revenue	Profit	Margin
United States	50 Inch HD A/V Wireless Plasma TV	15,785	\$63,124,215	\$4,719,715	7.48%
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OLAP Analysis



OLAP Analysis

		Ord_Yr			
		2006		2007	
Country	Product Name	Revenue	Margin	Revenue	Margin
United States	50 Inch HD A/V Wireless Plasma TV	\$30,540,363	7.48%	\$32,583,852	7.48%
United States	20 Inch LCD TV with PC/DVD/TV Inputs	\$12,923,118	18.70%	\$10,390,302	18.70%
United States	56 Inch Widescreen HDTV Monitor TV with DLP	\$6,456,996	13.02%	\$7,873,488	13.02%
United States	42 Inch Plasma Monitor/TV	\$6,431,413	8.31%	\$6,399,022	8.31%
United States	30 Inch LCD TV with PC/DVD/TV Inputs	\$5,717,800	11.50%	\$5,787,973	11.50%

OLAP Analysis

Measures Graph Time Period Product Location

Ord_Yr Ord_Qtr Ord_Mth

OLAP Run Reset Save Help

Save the data in an Excel file
 Save the data in an Excel 2000 file
 Save the data in an Excel 2000 file with formulas
 Display as a PDF Report
 Display as Active Report (Offline Analysis)
 Save Report

		2006		2007	
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5 of 5 records, Page 1 of 1

Ord_Yr

2006 2007

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OLAP Analysis

The screenshot shows an OLAP analysis tool interface. At the top, there are tabs for 'Measures', 'Graph', 'Time Period', 'Product', and 'Location'. Below these are three dropdown menus for 'Ord_Yr', 'Ord_Qtr', and 'Ord_Mth', all set to '--All--'. A toolbar contains buttons for 'OLAP', 'Run', 'Reset', 'Save', and 'Help'. A central window displays a table with columns 'Country' and 'Product Name'. To the right, a 'Margin' table shows percentages. A 'Save Dialog' window is open in the foreground, titled 'OLAP Save Dialog - Window...'. It shows the save location as 'Olap Reports' and a list of report types: 'Analysis Report' and 'Basic Report'. The 'Save As' field contains 'Yr over Yr Analysis'. There are 'Ok', 'Cancel', and 'Help' buttons at the bottom of the dialog. The dialog also has a checkbox for 'Save without OLAP' and a status bar at the bottom showing 'Internet' and '100%' zoom.

Country	Product Name
United States	50 Inch HD A/V Wireless Plasma TV
United States	20 Inch LCD TV with PC/DVD/TV Inputs
United States	56 Inch Widescreen HDTV Monitor TV with DLP
United States	42 Inch Plasma Monitor/TV
United States	30 Inch LCD TV with PC/DVD/TV Inputs

Margin
7.48%
18.70%
13.02%
8.31%
11.50%

OLAP Analysis

DB2 Web Query for System i **IBM.** Logoff | H
Powered By Information Builders

Domain View Report Broker

Reports

- Domains
 - Common Domain
 - DB2 Web Query Demo
 - OLAP Webcast
- Reports
 - OLAP Reports
 - Analysis Report
 - Basic Report
 - Yr over Yr Analysis**
 - Other Files

OLAP Analysis

DB2 Web Query for System i Logoff |

IBM.
Powered By Information Builders

Domain View | Report Broker

Reports

- Domains
 - Common Domain
 - DB2 Web Query Demo
 - OLAP Webcast
 - Reports
 - OLAP Reports
 - Analysis Report
 - Basic Report
 - Yr over Yr Analysis
 - Other Files

Measures | Graph | Time Period | Product | Location

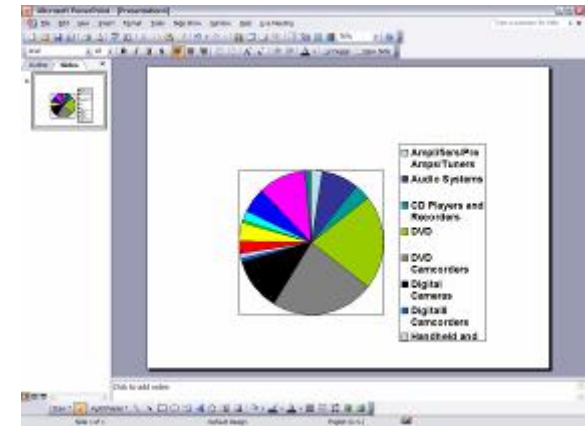
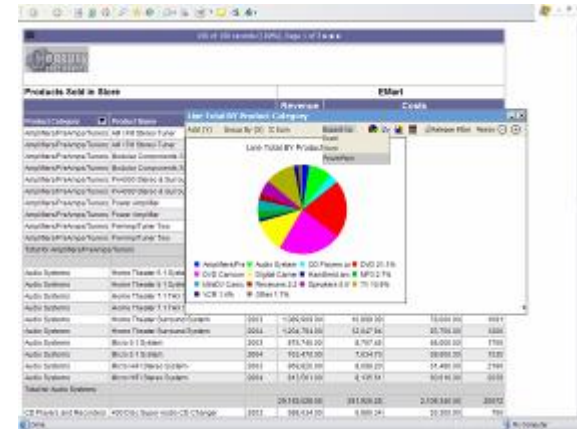
Ord_Yr: --All-- | Ord_Qtr: --All-- | Ord_Mth: --All--

OLAP | Run | Reset | Save | Help

		Ord_Yr			
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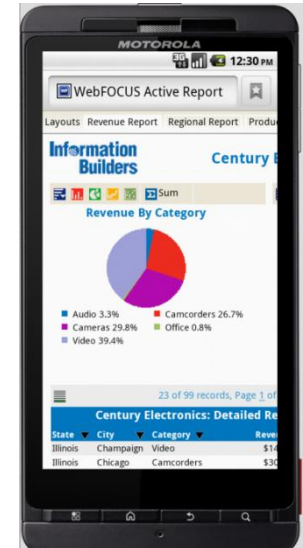
Support Mobile Users with Active Technologies

- Self-contained analytical reports
 - Delivered to users via email or browser
- Users interact with the data on the report w/o being connected to infrastructure
- Intuitive built-in controls
 - Sorting, Filtering, Visualization, Charting, Dynamic Roll-ups
 - Export to HTML, CSV or Excel
 - Export Charts to Word, Excel, or PowerPoint
- Great for mobile sales reps and other users that are not connected or defined to the System i

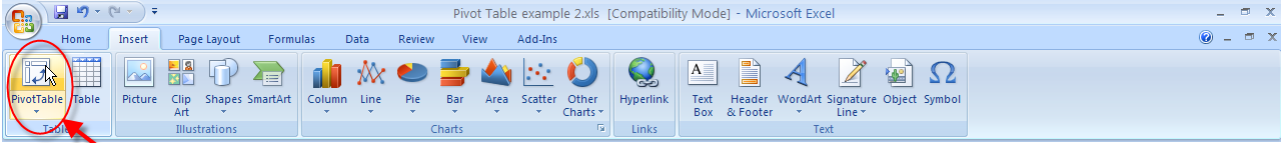


Active Technologies for Mobile Web Apps

- Ease of Use
 - Single-tap UI paradigm ****new**
 - Full gesture & screen rotation support ****new**
 - Embedded data analysis and visualization
 - Full offline data interactivity
- Ease of Development
 - Dynamic device detection
 - Build once, fit in any device
- Industry Standard
 - Send data with 128-bit encryption
 - Web Apps technology ****new**
 - iPhone App-like UI ****new**
 - Available in HTML or Flash ****new**



Leverage Spreadsheets with Pivot Tables



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Country	Region	State	Product Type	Product Category	Model	Order Date	Revenue	Cost of Goods Sold				
2	United States	Pacific	Washington	Audio	Amplifiers/PreAmps								
3	United States	New England	Connecticut	Audio	Amplifiers/PreAmps								
4	United States	South Atlantic	Georgia	Audio	Amplifiers/PreAmps								
5	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
6	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
7	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
8	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
9	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
10	United States	East North Central	Indiana	Audio	Amplifiers/PreAmps								
11	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
12	Canada	Eastern Canada	Ontario	Audio	Amplifiers/PreAmps								
13	United States	Middle Atlantic	New York	Audio	Amplifiers/PreAmps								
14	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
15	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
16	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
17	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps								
18	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps/Tuners	PA-100	11/2/2007	3237.00	2340.00				
19	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps/Tuners	PA-100	12/26/2007	249.00	180.00				
20	France	Provence - Alpes du Sud	Bouches-du-Rhone (13)	Audio	Amplifiers/PreAmps/Tuners	PA-100	11/8/2007	20916.00	15120.00				
21	United States	Web(R)	Web(S)	Audio	Amplifiers/PreAmps/Tuners	PA-100	10/15/2007	249.00	180.00				

Create PivotTable

Choose the data that you want to analyze

- Select a table or range
- Use an external data source

Table/Range: 'Web Query Report'!\$A\$1:\$I\$32284

Choose where you want the PivotTable report to be placed

- New Worksheet
- Existing Worksheet

Location:

OK Cancel

Report Distribution with Existing Job Scheduler

RUNWQFEX command

```
Run DB2 Web Query Report (RUNWQFEX)

Type choices, press Enter.

Domain name . . . . . > 'db2wbqry/db2wbqry.htm'
Folder . . . . . > #visiblea56gb
Report . . . . . > 'app/product_catalog.fex'

Additional parameters . . . . . > '&COUNTRY=United States'

Output . . . . . > *EMAIL *FTP, *EMAIL, *FILE
Recipient . . . . . cobbq@us.ibm.com

Sender . . . . . lp12ut21@us.ibm.com

Bottom
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys
```

DB2 Web Query Report Broker – 5733-QU3

Power Systems

- Automated Delivery Of Information
 - On Scheduled Basis
 - Daily, Weekly, Specific Days, exclude rules, etc.
 - On Event Basis
- Intelligent bursting
 - Ex: Regional Sales Report
- Additional output formats for batch reporting
 - (HTML, PDF, Excel, Active HTML)
- Delivery Destinations
 - E-mail
 - Printer
 - Save the reports for later viewing
- Notify Function
 - Send notification when report is complete or fails
 - Report Logging

The screenshot displays the DB2 Web Query Report Broker interface. The top window, titled 'My Report - Windows Internet Explorer', shows the configuration for a report named 'My Report'. The 'Distribution' section is expanded, showing 'Distribute report by:' set to 'Email'. The 'From' field is 'EndUser@mycompany.com', the 'Reply Address' is 'ReportBroker@mycompany.com', and the 'Subject' is 'My Report'. The 'Frequency' section shows 'Run Interval' set to 'Once' and 'Start Schedule' set to 'May 23, 2008 3: 34 PM'. The 'Report Options' section shows 'Send the Report in this Format' set to 'HTML - Web Page (*.htm, *.html)'. The 'Execution ID' is 'rdandrew'. The bottom window, titled 'DB2 Web Query for System i', shows a table of report schedules.

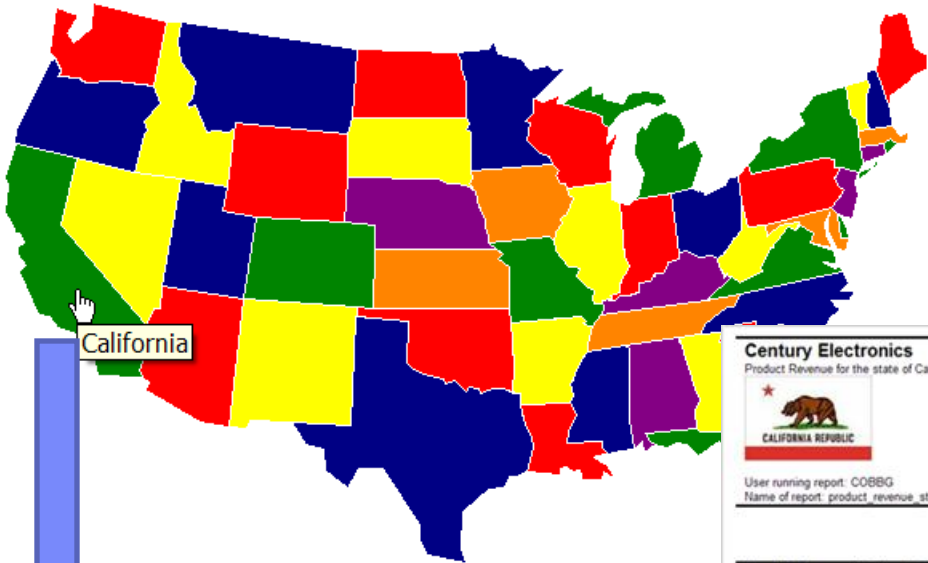
Schedule Id	Description	Next Run	Method	Distribution	Active	Owner
SeVEm5ApW4v	Revenue report 04/26/2008 09:08AM	None	E-Mail	lmswan@us.iy	Y	swan
ShFmmdaBumeQ	report1 04/25/2008 05:14PM	None	Managed	Managed	PlcY	rdandrew
SDa1OaWsbWC9	Revenue Chart by Product Type	None	E-Mail	lmswan@us.iy	Y	swan
S1364a99m01	NEW Schedule	None	E-Mail	lmswan@us.iy	Y	swan
S1366id2h04	Revenue report 04/30/2008 08:20AM	None	E-Mail	lmswan@us.iy	Y	swan3
S1382niff101	RA1 Revenue 04/25/2008 12:05PM	None	E-Mail	lmswan@us.iy	Y	swan
S1383ccc0901	Revenue report 04/25/2008 06:08PM	5/7/08 2:08 PM	E-Mail	lmswan@us.iy	Y	swan
S13651oal20s	Revenue Order count 04/26/2008 09:41AM	None	E-Mail	distord@us.iy	Y	swan
S13652l5oa0v	Daily schedule of revenue report	5/7/08 3:00 PM	E-Mail	lmswan@us.iy	Y	swan
S1365nk806	Clone of repeatno MFR-revenue report	None	Managed	Managed	PlcY	swan
S1365m0a09	report1 04/26/2008 11:10AM	5/7/08 4:10 PM	E-Mail	MFR-DIST	Y	swan
S1365677cs02	repeatinno MFR-revenue report	5/7/08 3:59 PM	Managed	Managed	PlcY	swan
S1366scoen0f1	Revenue Usino DIST list	None	E-Mail	/swan/mfrdist	Y	swan3
S1367m3iio0u	barchart	None	E-Mail	lmswan@chd.iy	Y	swan
S13685m120k	Clone of Daily revenue	Disabled	E-Mail	lmswan@us.iy	N	swan

Integrate DB2 Web Query Functions with Web Apps

Greatly simplifies report integration process

Map of the USA - Graphical Image Mapping


Click on any state to display Product Revenue Report for that state



Way COOL!!!

```
http://p12ut21:12321/wqsoa/report/?&zrdDomain=db2w
bqry%2Fdb2wbqry.htm&zrdFolder=%23visiblea56gb&zr
dReport=app%2Fproduct_revenue_state_report.fex
&STATE=California
```

Century Electronics
Product Revenue for the state of California



User running report: COBBG
Name of report: product_revenue_state_report

Product Type	Product Category	Quarter							
		2009Q1	2009Q2	2009Q3	2009Q4	2010Q1	2010Q2	2010Q3	2010Q4
Audio	Amplifiers/Preamplifiers/Tuners	\$316,670.00	\$285,817.00	\$261,079.00	\$135,456.00	\$583,089.00	\$383,009.00	\$371,263.00	\$107,285.00
	Audio Systems	\$2,078,202.00	\$1,181,613.00	\$334,357.00	\$967,516.00	\$3,425,742.00	\$1,269,822.00	\$10,374.00	\$165,917.00
	CD Players and Recorders	\$389,906.00	\$396,025.00	\$532,414.00	\$481,673.00	\$379,607.00	\$48,022.00	\$258,313.00	\$58,017.00
	MP3	\$596,187.00	\$216,425.00	\$288,303.00	\$121,563.00	\$403,346.00	\$561,812.00	\$96,000.00	\$137,964.00
	Receivers	\$552,309.00	\$124,260.00	\$337,373.00	\$121,666.00	\$615,410.00	\$625,218.00	\$273,859.00	\$38,009.00
Camcorders	Speakers	\$1,564,280.00	\$707,893.00	\$439,278.00	\$199,503.00	\$2,234,284.00	\$338,864.00	\$225,108.00	\$403,989.00
	Digital8 Camcorders	\$164,514.00	\$173,938.00	\$56,939.00	\$23,478.00	\$157,896.00	\$220,354.00	\$85,960.00	
	DVD Camcorders	\$4,373,848.00	\$3,474,941.00	\$1,976,932.00	\$871,989.00	\$6,651,807.00	\$2,736,500.00	\$712,920.00	\$1,314,308.00
Cameras	MiniDV Camcorders	\$440,805.00	\$976,405.00	\$271,491.00	\$37,559.00	\$1,483,016.00	\$334,476.00	\$776,379.00	\$204,108.00
	Digital Cameras	\$2,071,035.00	\$1,132,656.00	\$1,119,841.00	\$625,807.00	\$2,753,263.00	\$1,118,121.00	\$1,239,157.00	\$658,363.00
Office	Handheld and PDA	\$254,812.00	\$215,931.00	\$34,159.00	\$220,783.00	\$215,163.00	\$249,488.00	\$145,015.00	
	Organizers	\$163,912.00	\$31,414.00	\$53,920.00	\$40,779.00	\$197,117.00	\$121,690.00	\$56,362.00	\$25,623.00
Video	DVD	\$6,004,929.00	\$2,605,021.00	\$902,360.00	\$506,752.00	\$3,459,714.00	\$3,073,175.00	\$1,166,628.00	\$392,849.00
	TV	\$3,372,080.00	\$143,910.00		\$19,188.00	\$1,644,309.00	\$630,641.00	\$2,414,264.00	
	VCR	\$180,479.00	\$128,885.00	\$82,317.00		\$74,454.00	\$76,209.00	\$68,355.00	

DB2 Web Query Standard Edition

- A pre-bundled set of software to make ordering easier
- Standard Edition includes:
 - DB2 Web Query base product with n included users (5733QU2 *BASE)
 - n is 2 to 20, just as before, based on processor tier
 - 4 additional user licenses (total licenses is 6 to 24)
 - Run Time User License (essentially an unlimited run time user license)
 - Active Technologies: Mobile Support
 - OLAP Module: Analytical Reporting
 - Developer Workbench: Meta Data Management and Dashboarding
 - Spreadsheet Plug In
 - Automated Report Scheduling and Distribution
 - Application Integration Toolkit (Generate URL interface)
- Generally Available (GA) on October 14, 2011
 - Add additional users
 - Add JDE or SQL Server Adapter
 - Add 5250 Reporting Extension



Architectures to support BI Applications

Operational Reporting

- Deployed On Existing i server
- Simple reporting and BI
- No data replication or transformations
- Mixed workloads (OLTP and heavy query)



DB2 Web Query

Optimized Operational Reporting *Appliance*

- Optimized environment for operational reporting
 - Separate BI from OLTP workload
 - Multi-purpose 2nd System
 - Simple, low cost data replication
 - Foundation for data warehouse

IBM i for Business Intelligence

Data Warehouse

- Extend value of IBM i for Business Intelligence to Data Warehouse – ie. analytics vs. reporting
- Add an ETL tool for data transformation
- CDC (transport) and an ETL (transform) can provide near real time analytics
- Fully leverage advanced DB2 i technology

IBM i for Business Intelligence + ETL and Services

Mixed Workload
Diminished Efficiencies

Workload Optimized
Simplify - Accelerate Value - Reduce Cost

DB2 for i clients that simply want to replace Query/400 with a modernized, web based software

DB2 for i clients that want a modernized reporting environment with isolation from production impact and room for growth

Customers who want a true Data Warehouse appliance

Lower

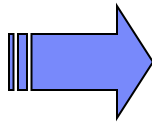
Complexity/Cost

Higher

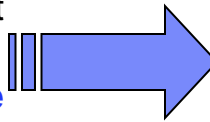
Announcing: IBM i for Business Intelligence

Power Systems

Production System



Extract, Transport
and Load Data
using **InfoSphere
Software**



IBM i for BI



- Choose from small, medium, or large configurations
- Get new reports/information - in days
- Replicate production database to 2nd system
- Isolate query workloads (tune, optimize)
- LOW Entry price point that you can build on
- Leverage the system for additional purposes

Power 720

8202-E4C

IBM i 7.1

DB2 for i

DB2 Web Query

Omnifind Text Search

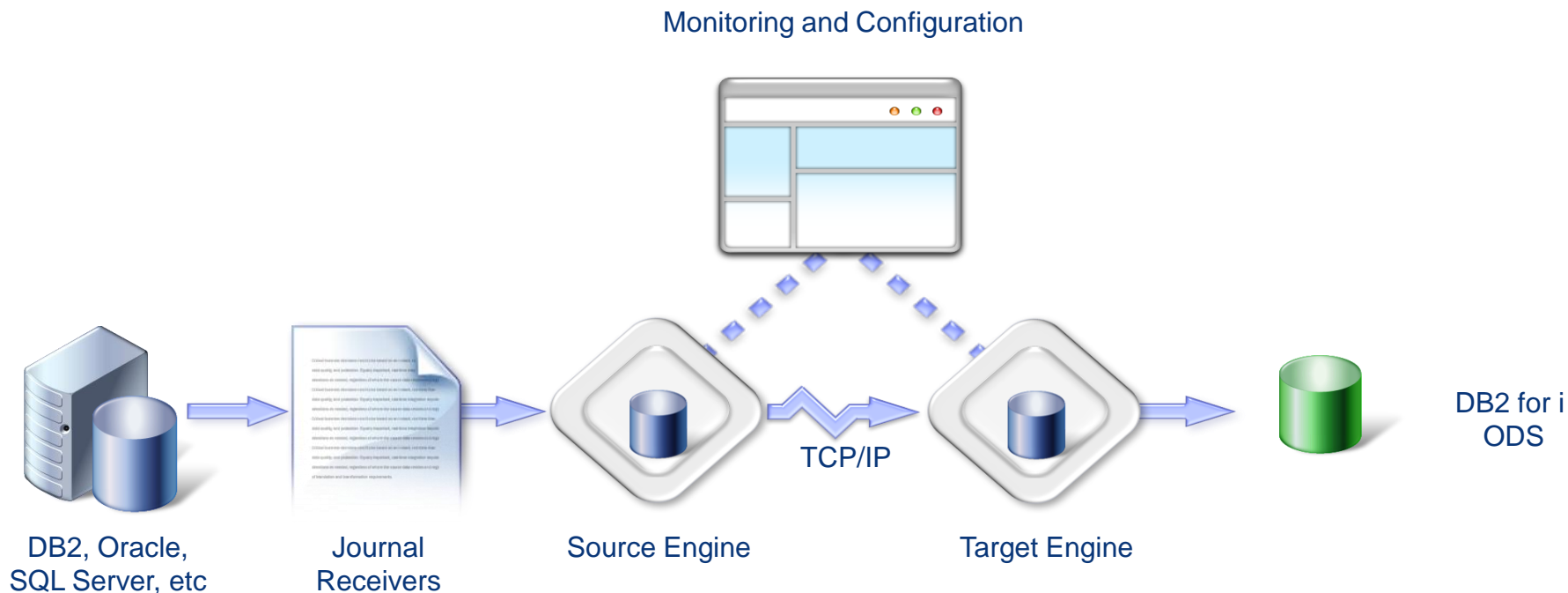
Reliable, secure and flexible server for UNIX, IBM i and Linux workloads. This model is particularly well suited for the IBM i customer base.

The Operational Data Store

- **What is an Operational Data Store (ODS)?**
 - A COPY of the operational (transaction) data base most often used for reporting purposes
 - ISOLATED from production workloads
 - Kept up to date based on requirements
 - Near real time?
 - The data model stays pretty much the same as production, with possibly some minor changes
 - Could have subset of fields/ columns
 - Could contain more historical data than production systems
 - Could contain minimal data transformations
 - Could encrypt/mask certain data elements
 - Enhanced for performance
 - Aggregations of the data
 - Indexing
 - Security model might be different
 - Platform can be TUNED for reporting purposes without impacting OLTP system

Populating the ODS with IBM's Infosphere CDC

- **Changed Data Capture (CDC) Replication Software**
 - Based on journaling
 - Remote or Local
 - Requires both before and after images to be store in journal receiver
 - Techniques to do INITIAL loads with sync points
 - Java GUI to set up and monitor (no programming required)
 - Minimal transformations



Expanding IBM i for Business Intelligence

Power Systems

STAGE 1



BI Edition

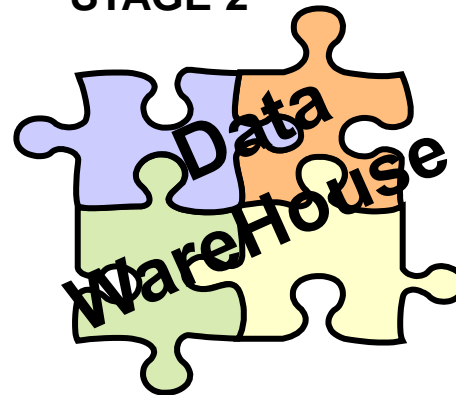
- 1) Power 720 Express
- 2) DB2 Web Query
- 3) 3 day Service Voucher

+

InfoSphere CDD

Software used to Extract, Transport and Load data into DB2 for i

STAGE 2



BI Edition

- 1) Power 720 Express
- 2) DB2 Web Query (repackaged)
- 3) 3 Day Service Voucher

+

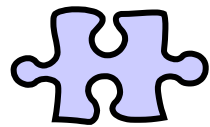
InfoSphere CDD

Software used to Extract, Transport and Load data into DB2 for i

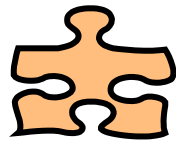
+

Additional ETL Tools/Services

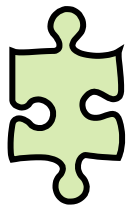
Software and Services purchased to Extract, Transform and Load data from multiple system sources



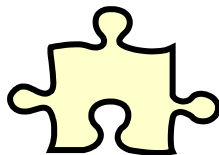
DB2 Web Query



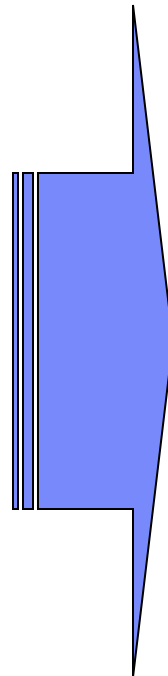
POWER Express
720



Data Transport
and Load SW



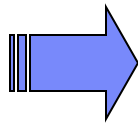
Consulting
and
Services



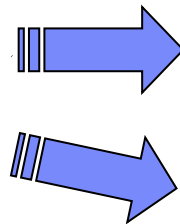
Expanding the IBM i for BI into Data Warehousing

Power Systems

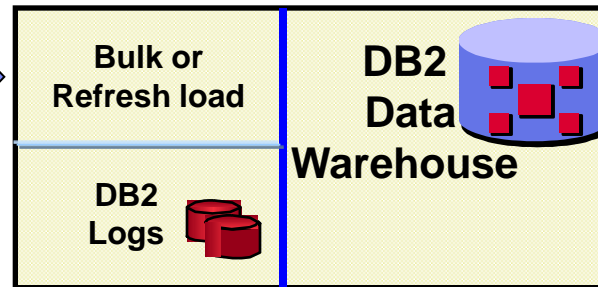
Production System



Extract and Transport Data using **InfoSphere Software**



Purchase additional ETL Tools/Services



IBM i for BI



Transform and Load Data into DB2 Data Warehouse

IBM i for Business Intelligence

- ETL process TRANSFORMS and cleanses data
 - Bulk load or refresh
 - Scheduled or continuous updates
- Restructuring of the data improves analytics (for example: create a customer profiling database)
- Isolate query workloads (tune, optimize)

Transformation Example: Surrogate Keys

Customer File - US	
CUSTNO	CUSTNAME
1001	John Smith
1002	Mary Jones
1003	Chris Anderson
1004	David Perry

Customer File - Canada	
CUSTNO	CUSTNAME
1001	Harry Potter
1002	Jeremy Carr
1003	Penny Hayes
1004	Debbie Thornton



Surrogate key is a sequential number with no correlation to replaced value(s)

Customer File - Data Warehouse			
CUSTNUMBER	CUSTNAME	REGION	OLDNUM
1	John Smith	US	1001
2	Mary Jones	US	1002
3	Chris Anderson	US	1003
4	David Perry	US	1004
5	Harry Potter	CANADA	1001
6	Jeremy Carr	CANADA	1002
7	Penny Hayes	CANADA	1003
8	Debbie Thornton	CANADA	1004

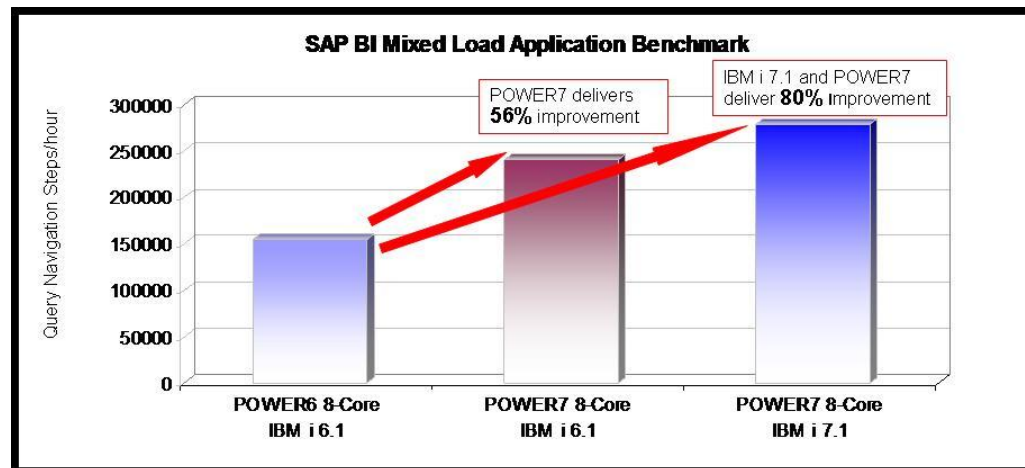
PK

Secondary Index

- Many other examples
 - Restructure the data into a Star Schema data model
 - Add aggregations
 - Manage slowly changing dimensions

- Do it yourself
 - Custom coding
 - Consider use of SQL vs. RPG record level processing
- **IBM i** based (DB2 Web Query Meta Data Integration)
 - Information Builder's Data Migrator
 - www.ibi.com
 - Coglin Mill's Rodin DB2 Web Query Edition
 - www.coglinmill.com
- High End (AIX LPAR)
 - IBM InfoSphere Data Stage
 - Strong source and target support
 - Parallelism built into the load processes
 - Many data transformations built in

DB2 for i Query Optimization



DB2 Symmetric Multiprocessing (feature of IBM i)

■ SELECTING

- Index scan or probe
- Table scan or probe via bitmap or RRN list
- Table scan

■ JOINING

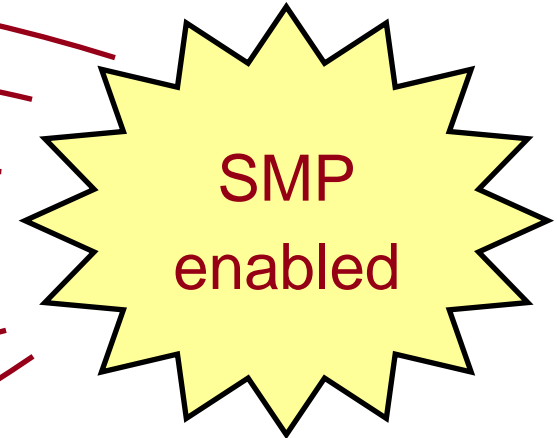
- Index scan or probe
- Hash

■ GROUPING

- Index scan or probe
- Hash

■ ORDERING

- Index scan or probe
- Sort



- Creating temporary indexes for joining, grouping or ordering is SMP enabled

SQL Query Engine

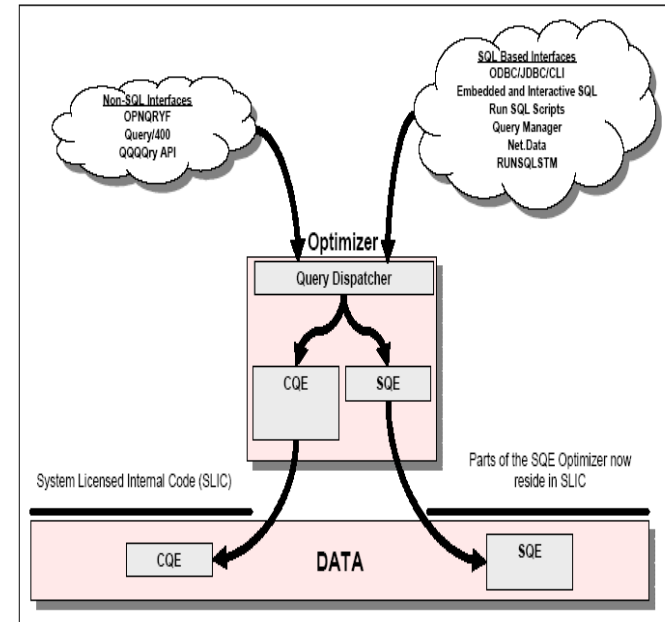
- **Advanced query optimization, query execution engine, and management tools**
 - Part of DB2 since V5R3
 - Enhanced with each subsequent release
 - Leverages more DB2 performance and management facilities
 - Encoded Vector Indexes, Materialized Query Tables
 - SQL Plan Cache (part of IBM i Navigator)

7.1 Enhancements

- Adaptive Query Processing (AQP)
- Support for Logical Files

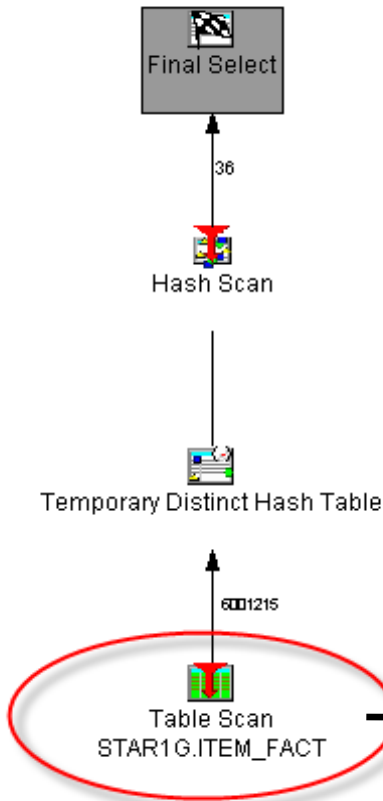


- NOTE: CQE, or “Classic” Query Engine, is also part of DB2 to support non SQL Standard Interfaces for accessing DB2
 - Query/400
 - Some ISV Applications
 - Limited ability to leverage



Materialized Query Tables (MQT)

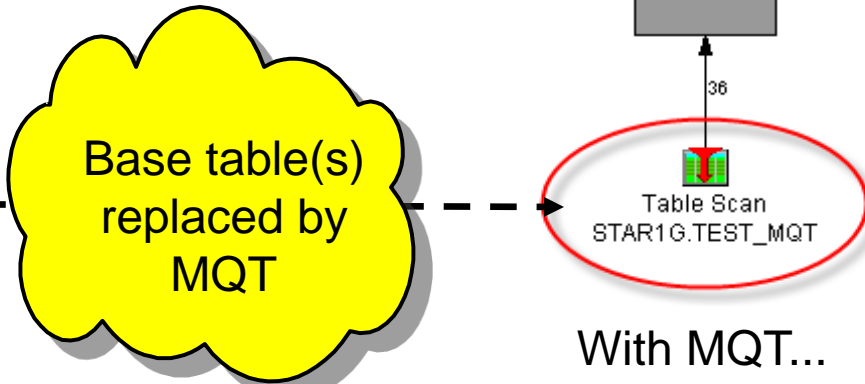
Before...



Without MQT...
Scan and aggregate
6,000,000 rows

```
SELECT year, quarter, month,  
SUM(revenue_w_tax) AS srevenue_w_tax,  
SUM(revenue_wo_tax) AS srevenue_wo_tax,  
SUM(profit_w_tax) AS sprofit_w_tax,  
SUM(profit_wo_tax) AS sprofit_wo_tax,  
SUM(quantity) AS squantity,  
COUNT(*) as number_items_per_group  
FROM ITEM_FACT  
GROUP BY year, quarter, month;
```

After...



With MQT...
Scan 36 rows

Highlight
MQT
In V5R4

V6R1: Improved Refresh Performance!

Encoded Vector Index (EVI) Aggregates (7.1)

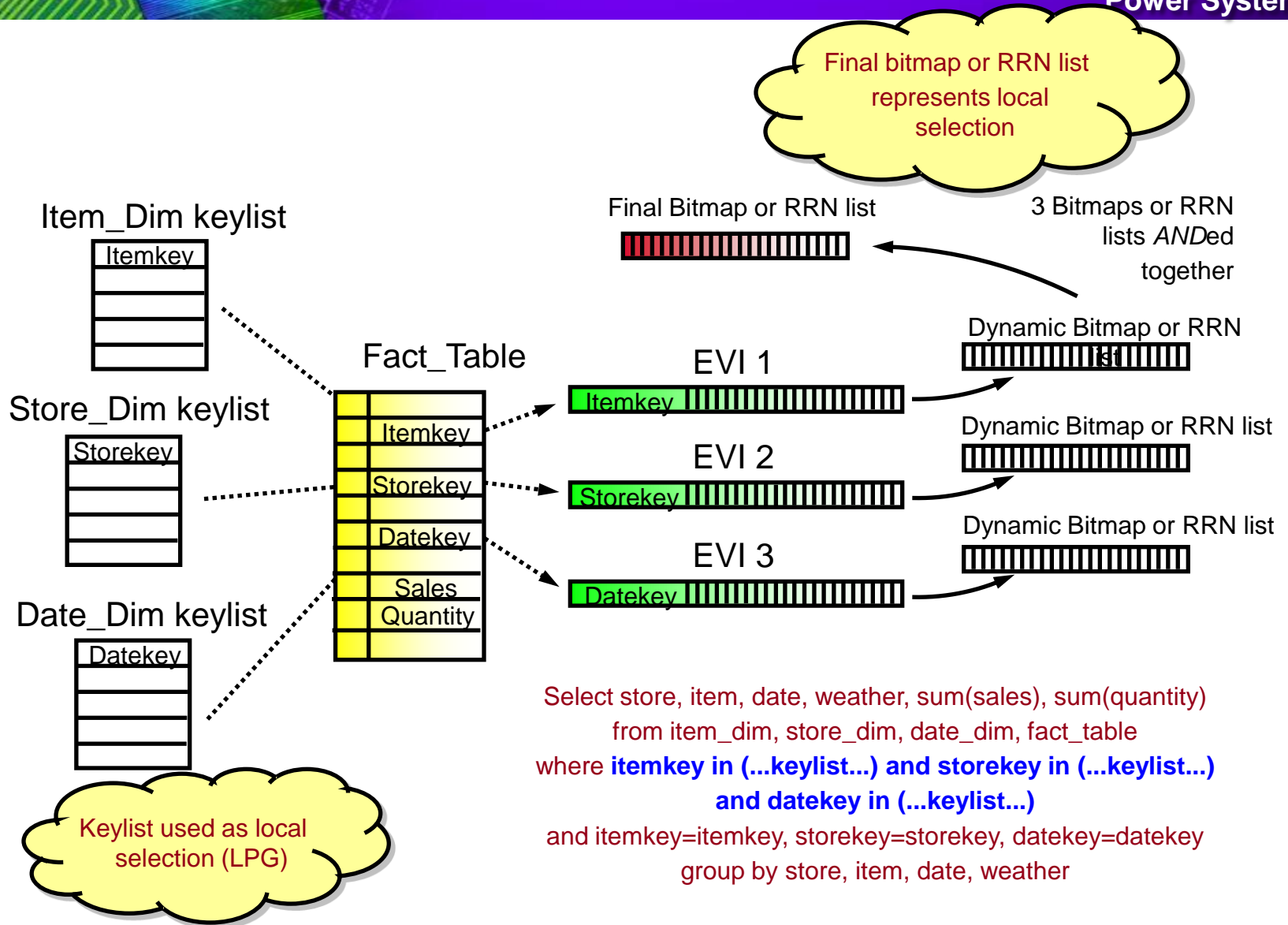
Symbol Table				
Key Value	Code	Count	Include Sum()	Include Sum()
Arizona	1	5000	1500	2005
Arkansas	2	7300	3200	450
...				
Wisconsin	49	340	575	1200
Wyoming	50	2760	210	0

Optional (7.1)

Vector	RRN
1	1
17	2
5	3
9	4
2	5
7	6
50	7
49	8
5	9
...	...

- Symbol table contains information for each distinct key value
 - Each key value is assigned a unique code (key compression)
 - Code is 1, 2, or 4 bytes depending on number of distinct key values
- Rather than a bit array for each distinct key value, use one array of codes

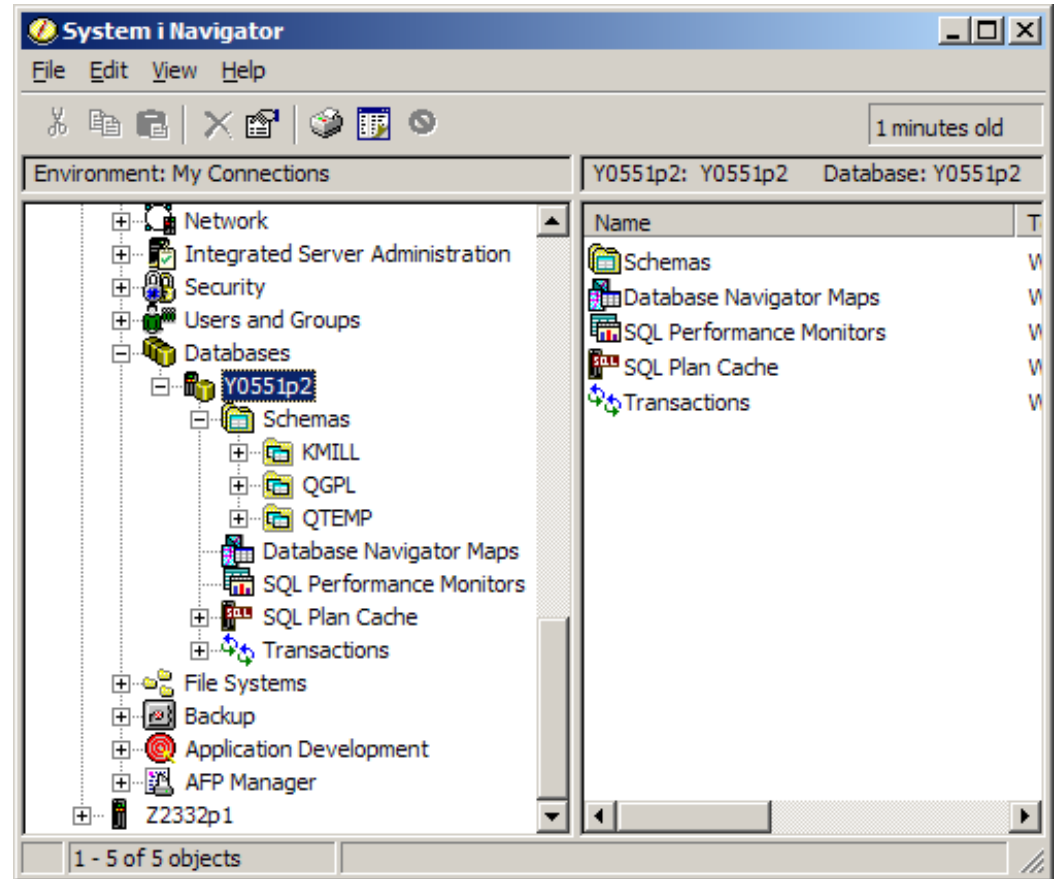
Star / Snowflake Schema Processing in DB2 for i






Establish Best Practices for Managing Query Performance

Power Systems

- DB2 for i Administration
 - Part of i Navigator
 - Performance Analysis Tools
 - Database Monitors
 - SQL Plan Cache
 - Visual Explain
 - Index Advice
 - Index Evaluation
 - Reporting Functions
 - Save to spreadsheet
 - Filters
 - Documentation Tools
 - Database Navigator



Consider Getting “Best Practices” Guidance

- DB2 for i web site – articles, papers, presentations
 - ibm.com/systems/i/software/db2/
- Briefings, consulting and guidance on demand*
- IBM i for Business Intelligence Installation Services 
- DB2 Web Query Getting Started Services*
- Query/400 Modernization Services* 
- DB2 for i Modernization Workshop(s)
- DB2 for i SQL Performance Workshop
- DB2 for i SQL Performance Health Check*
- DB2 for i Very Large Database (VLDB) Assessment* 
- DB2 for i remote database administration and engineer services

For more information, contact Mike Cain (cain@us.ibm.com)
Or Doug Mack (mackd@us.ibm.com)



IBM Systems and Technology Group Lab Services
Helping our clients WIN the race

- Demos
 - 40 minute overview
 - 75 minute deeper dive
- Helpful Getting Started Tab
 - Latest Installation Instructions
 - Links to our “community”
 - Education and RedBook Offerings
 - Recent Articles (tips and techniques)
- Additional Product Information
- Access to Developer Workbench trial
- Papers
 - FAQs
 - Why i for BI
 - How Run Time Enablement Works

The screenshot shows the IBM website page for DB2 Web Query for i. The page is titled "IBM DB2 Web Query for i" and is described as "Easy to use, powerful database queries for DB2 on IBM i". The page layout includes a navigation menu on the left with categories like "IBM i", "Advantages", "Hardware resources", "Virtualization", "Software", "Support and services", "Resources", and "News". The main content area features a "Highlights" section with bullet points: "Modernize Query for IBM® iSeries® (Query/400) reports with browser-based tools", "Hide complexity of accessing data from end users through metadata layer and parameterized reports", "Improve performance of queries by leveraging advanced IBM DB2® for i query optimization features", and "Reduce IT support efforts with single server-based installation and maintenance". Below this is a section titled "i want everything to just work. i want control. i want an i" followed by a paragraph about Business Intelligence (BI) and a section about the core of any business intelligence solution. The page also includes a "Related links" section, a "See Demonstrations of DB2 Web Query for i" section, and a "Business Intelligence" section. The footer contains links for "About IBM", "Privacy", "Contact", "Terms of use", and "IBM Feeds".

Lastly, a word about Cognos

- All of the previously mentioned DB2 for i query optimization issues apply !
- Cognos does not run in IBM i, however, can access DB2 for i
- Cognos CAN run in an Linux on Power or AIX Partition
 - For BEST PRACTICES for running Cognos in an AIX partition, refer to:
 - http://www-304.ibm.com/partnerworld/wps/servlet/ContentHandler/whitepaper/aix/v6r1_cognos/methods
 - Exploiting PowerVM in a Cognos environment
 - <http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg247842.html?Open>

Questions & Answers

