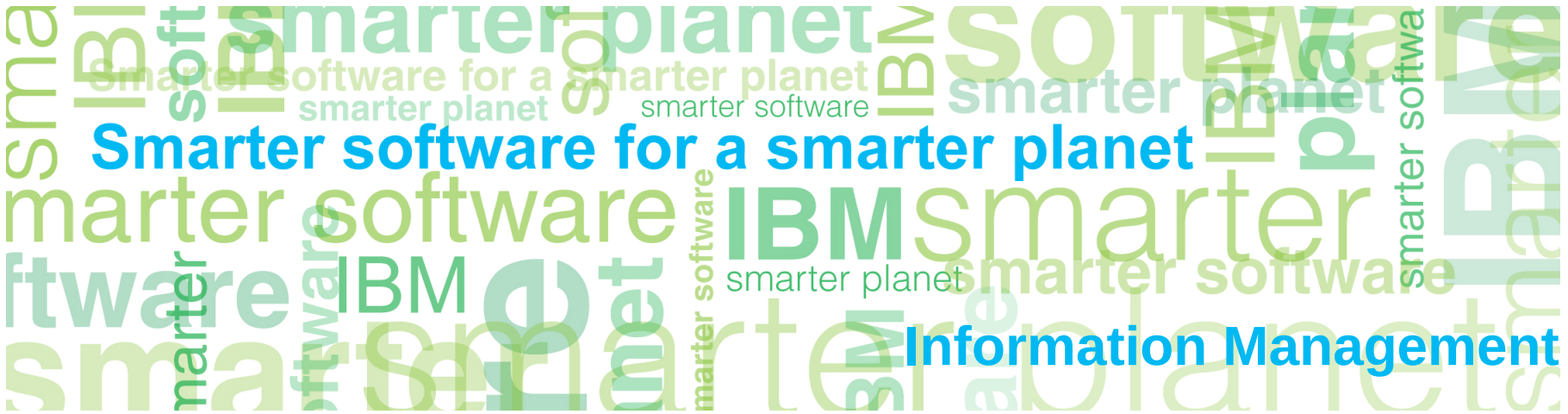
Predictive analysis with SPSS en Cognos

Look beyond your dashboard when you're driving



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Beyond the dashboard…

4 statements:

- **Dashboards are a tool, not a purpose…**
- **Your information is to serve you…**
- **Do you get all the information out your data?**
- **Key Performance Indicators and Key Performance Predictors…**

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Agenda

- **Performance management and predictive analytics basics**
- **Solutions**
- **Example how to combine BI and Advanced Analytics**

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Optimized Business Performance Depends on Decisions and Actions

MARKETING

FINANCE

SALES

HR

Decide & Act

CUSTOMER SERVICE

IT

PRODUCT DEVELOPMENT

OPERATIONS

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All Decision-Makers Must be Able to Answer…

MARKETING

FINANCE

SALES

HR

What is Happening?

Why?

What Should We Be Doing?

CUSTOMER SERVICE

IT

PRODUCT DEVELOPMENT

OPERATIONS

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Example: Driving Better Business Outcomes in Sales

MARKETING

FINANCE

SALES

HR

- *Do we have enough pipeline across all regions to make our forecast?*
- *Why not? Which reps are most successful?*
- *If I add more sales reps to Europe, will that maximize revenue?*

CUSTOMER SERVICE

IT

PRODUCT DEVELOPMENT

OPERATIONS

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What's happening?

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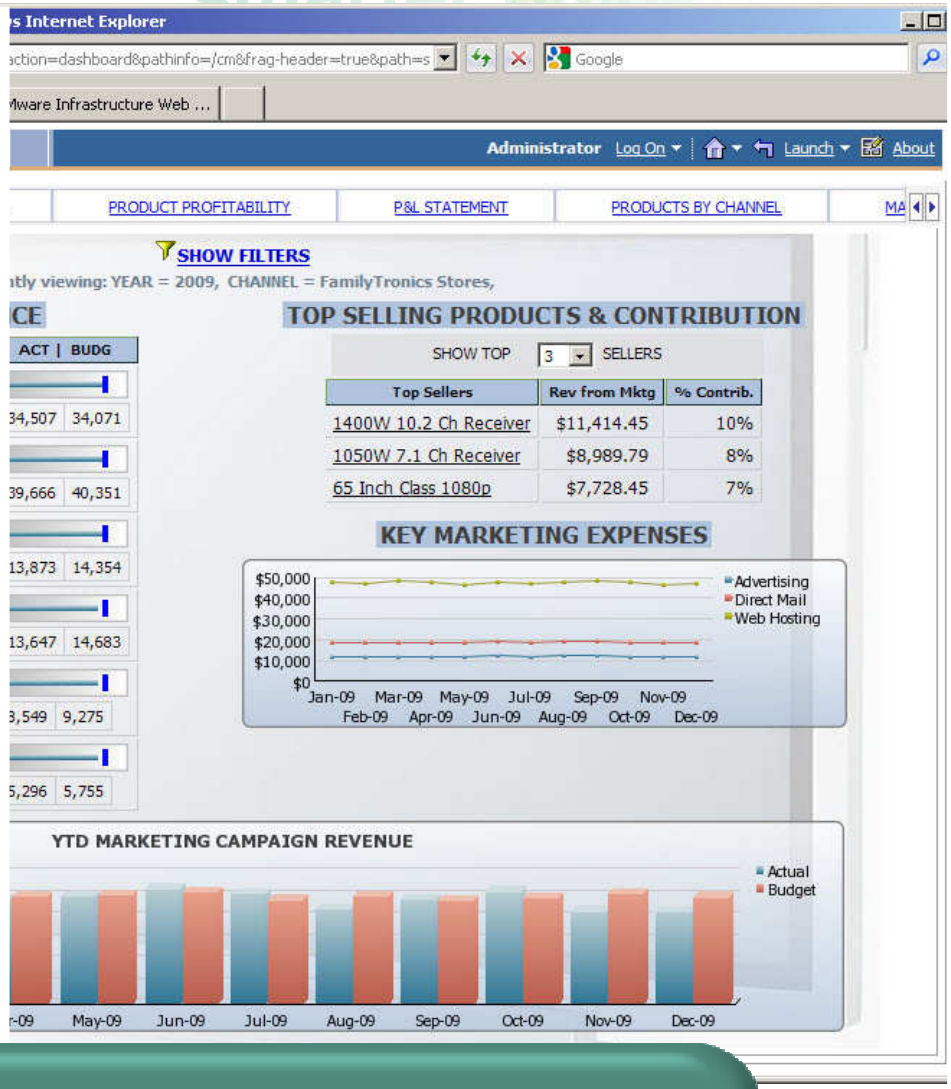
What's Happening?

Scorecards & Dashboards

Reports



Immediate Insights to Business Performance

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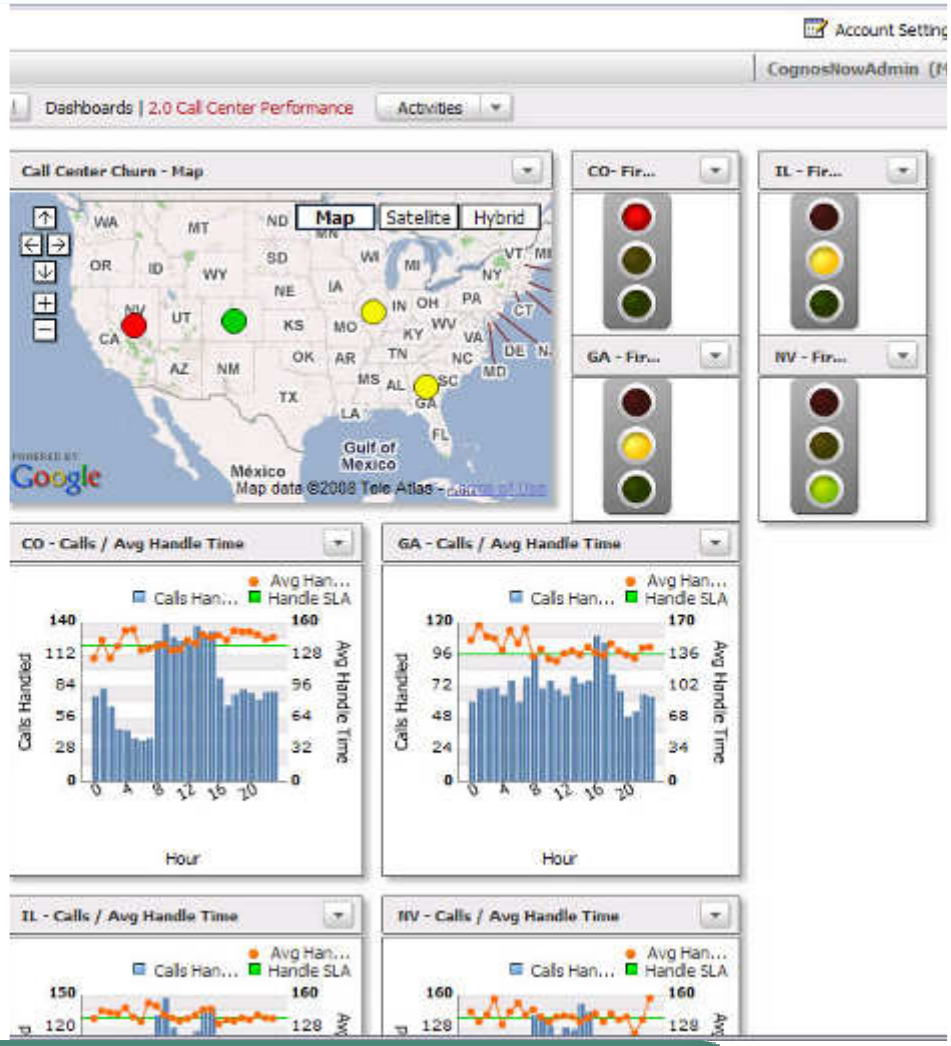
What's Happening?

- Scorecards & Dashboards
- Reports
- Real Time Monitoring



Immediate Insights to Business Performance

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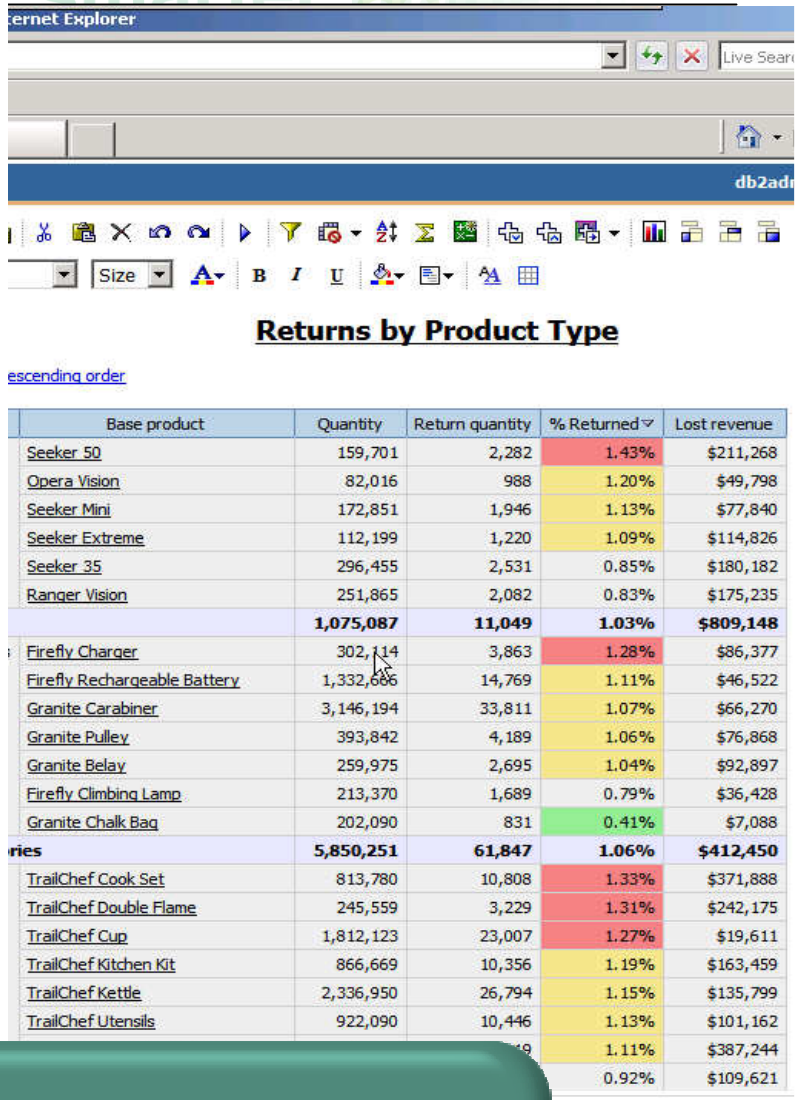
Why?

Ad Hoc Query



Base product	Quantity	Return quantity	% Returned	Lost revenue
Seeker 50	159,701	2,282	1.43%	$211,268
Opera Vision	82,016	988	1.20%	$49,798
Seeker Mini	172,851	1,946	1.13%	$77,840
Seeker Extreme	112,199	1,220	1.09%	$114,826
Seeker 35	296,455	2,531	0.85%	$180,182
Ranger Vision	251,865	2,082	0.83%	$175,235
	1,075,087	**11,049**	**1.03%**	**$809,148**
Firefly Charger	302,114	3,863	1.28%	$86,377
Firefly Rechargeable Battery	1,332,666	14,769	1.11%	$46,522
Granite Carabiner	3,146,194	33,811	1.07%	$66,270
Granite Pulley	393,842	4,189	1.06%	$76,868
Granite Belay	259,975	2,695	1.04%	$92,897
Firefly Climbing Lamp	213,370	1,689	0.79%	$36,428
Granite Chalk Bag	202,090	831	0.41%	$7,088
ries	**5,850,251**	**61,847**	**1.06%**	**$412,450**
TrailChef Cook Set	813,780	10,808	1.33%	$371,888
TrailChef Double Flame	245,559	3,229	1.31%	$242,175
TrailChef Cup	1,812,123	23,007	1.27%	$19,611
TrailChef Kitchen Kit	866,669	10,356	1.19%	$163,459
TrailChef Kettle	2,336,950	26,794	1.15%	$135,799
TrailChef Utensils	922,090	10,446	1.13%	$101,162
			1.11%	$387,244
			0.92%	$109,621

Deeper Analysis of Trends & Patterns

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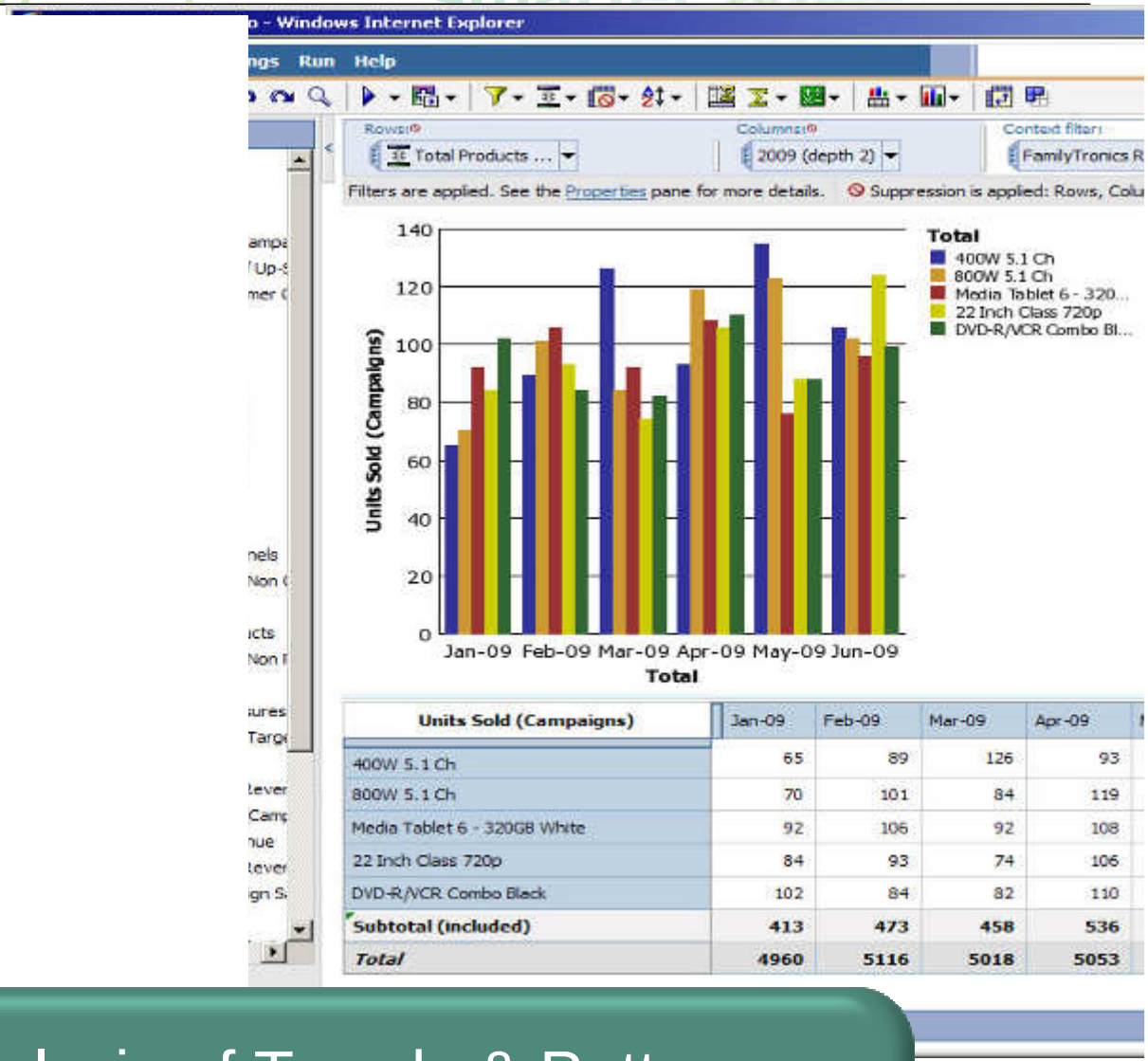
Why?

- Ad Hoc Query
- Trend & Statistical Analysis



Units Sold (Campaigns)	Jan-09	Feb-09	Mar-09	Apr-09
400W 5.1 Ch	65	89	126	93
800W 5.1 Ch	70	101	84	119
Media Tablet 6 - 320GB White	92	106	92	108
22 Inch Class 720p	84	93	74	106
DVD-R/VCR Combo Black	102	84	82	110
Subtotal (included)	**413**	**473**	**458**	**536**
Total	**4960**	**5116**	**5018**	**5053**

Deeper Analysis of Trends & Patterns

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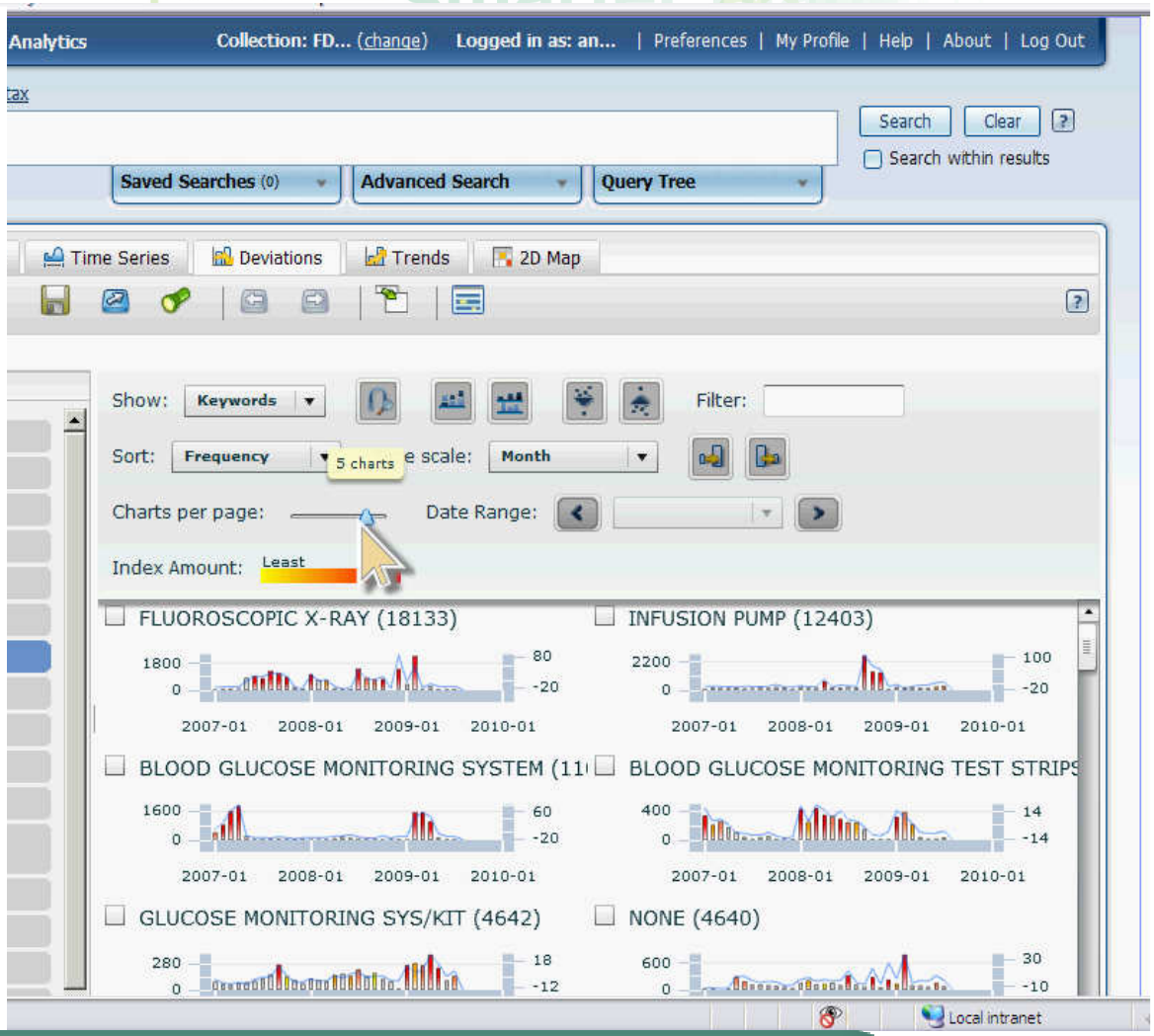
Why?

- Ad Hoc Query
- Trend & Statistical Analysis
- Content Analytics



Deeper Analysis of Trends & Patterns

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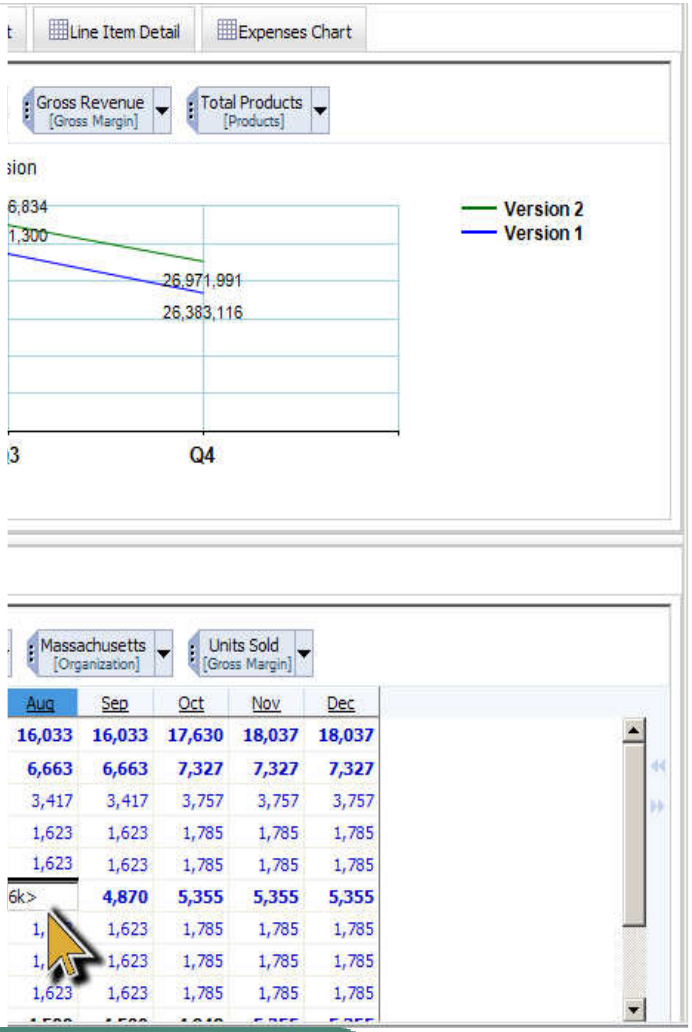
What Should We Be Doing?

‘What if’ Scenario Analysis



Foresight to Plan & Allocate Resources

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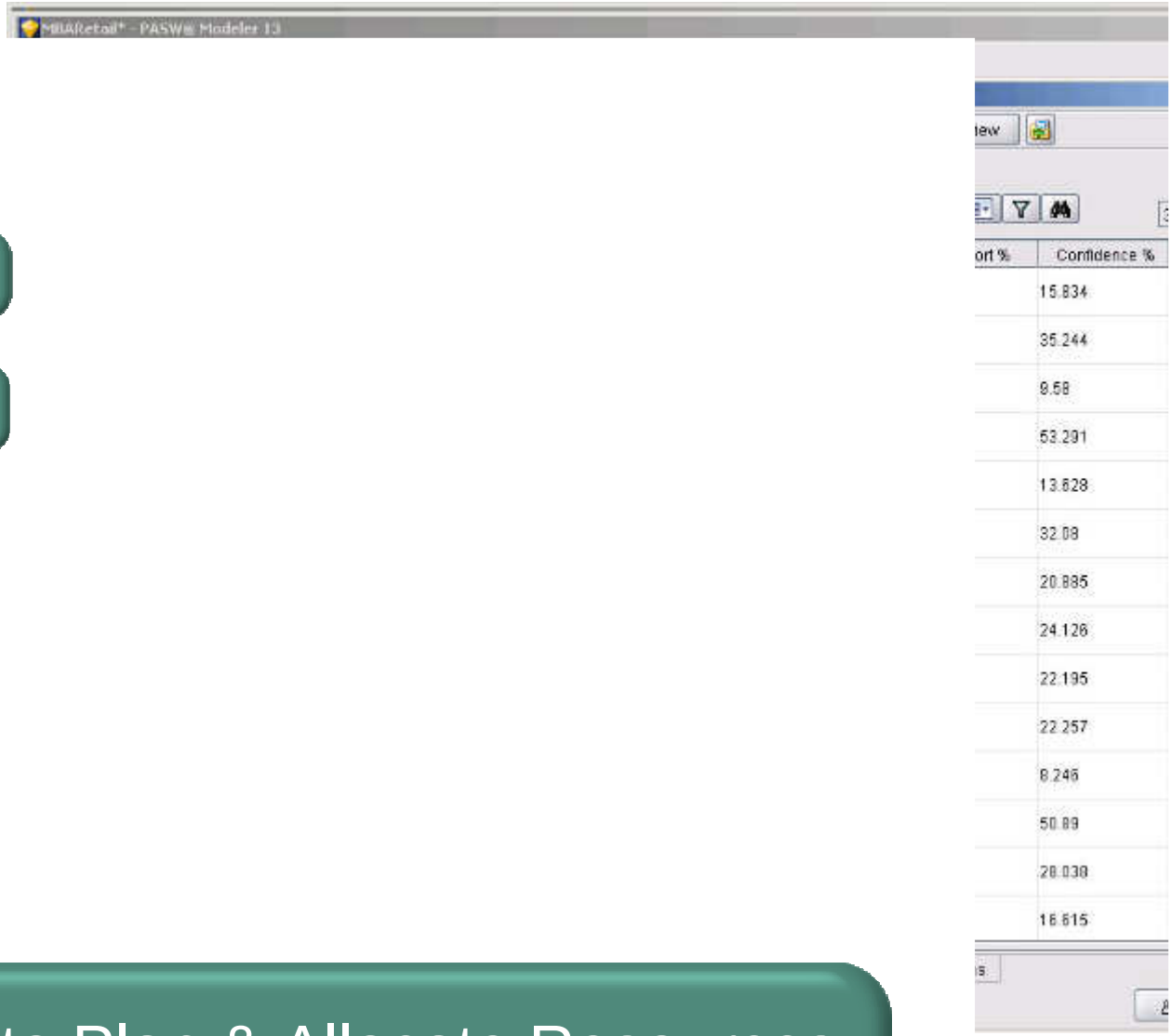
What Should We Be Doing?

‘What if’ Scenario Analysis

Predictive Modeling



Foresight to Plan & Allocate Resources

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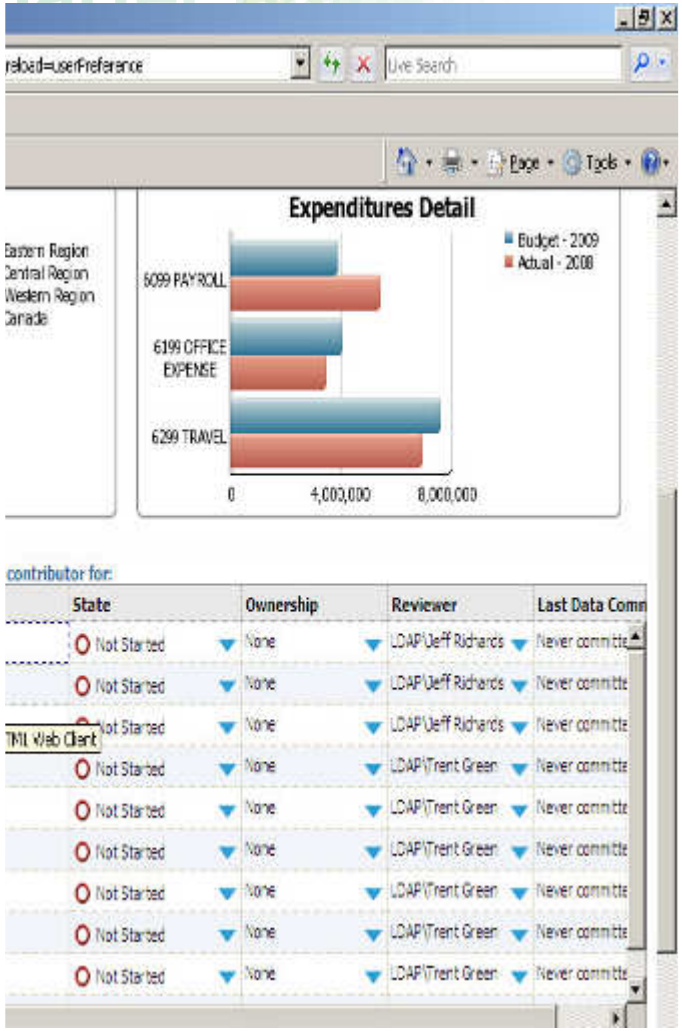
What Should We Be Doing?

- ‘What if’ Scenario Analysis
- Predictive Modeling
- High Participation Planning



Foresight to Plan & Allocate Resources

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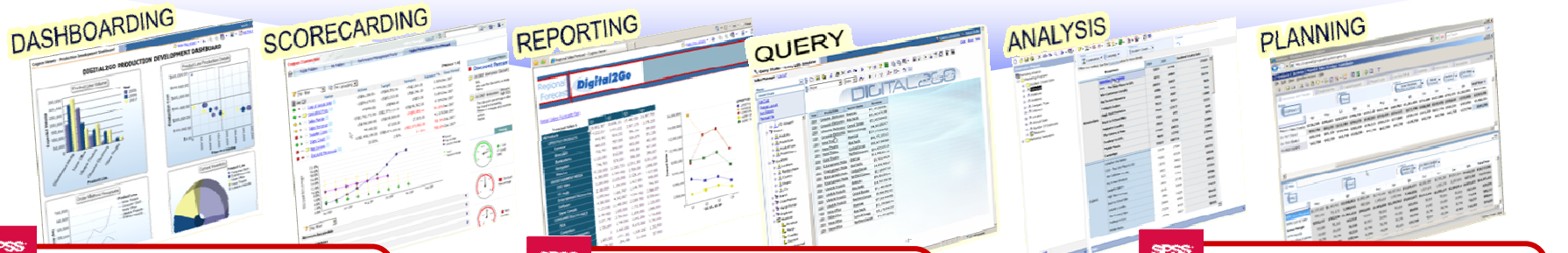
Performance management with the predictive edge

How are we doing?

Why are we on/off track?

What should we do next?



- Addition of KPPs (Key Performance Predictors)
- Broad distribution of statistical results
- Time series forecasting
- New customer insight through Data Collection
- Predictive analytics for deeper understanding of the data

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Solutions

Look beyond your dashboard when you're driving

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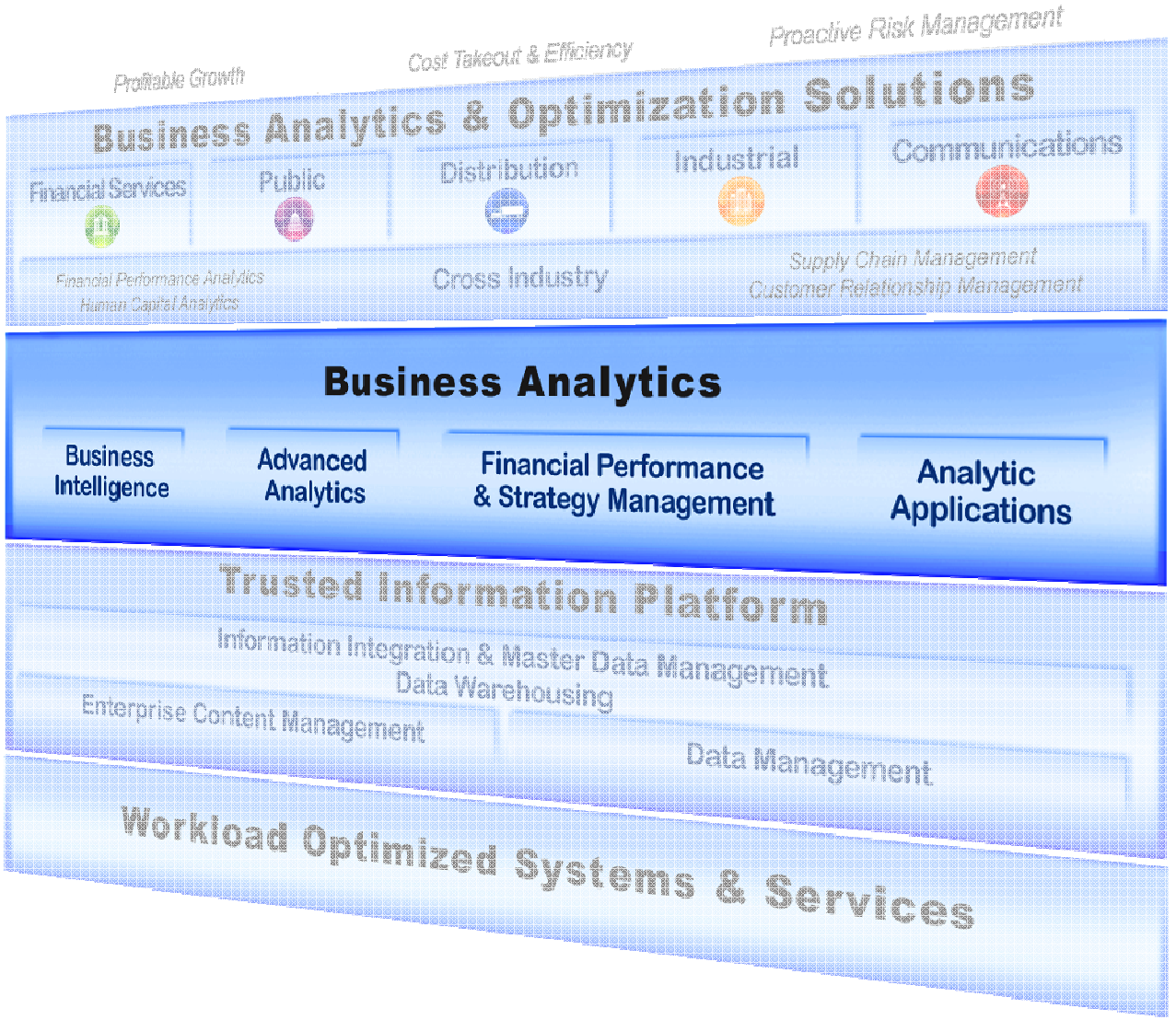
Business Intelligence

Cognos software

SPSS AN IBM COMPANY



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Business Intelligence

Query, reporting, analysis, scorecards and dashboards to enable decision makers across the organization to easily find, analyze and share the information they need to improve decision making

Who's concerned?: IT *and* Business leaders

Top pain points:

- **Information not trusted** (incomplete, inconsistent, out of date, not relevant to the decision maker)
- **Too hard** to explore information without IT help
- IT can't address huge **backlog of requests** from the business
- Fragmented technology; **too many BI tools** deployed
- **Complexity** of disparate data sources and environment

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IBM Cognos 8 BI

- **Full range** of BI capabilities (query, reporting, analysis, scorecarding, dashboarding) that deliver **information where, when and how it is needed**
  - Self-service reporting and analysis
  - Automated delivery of information in context
  - Author once, consume anywhere

- **Purpose-built SOA** platform that fits client environments and **scales** easily from departments to enterprise-wide deployments

✓ **Enables every decision-maker to make better decisions, faster**
✓ **High user satisfaction and IT efficiency**

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IBM Cognos 8 BI – Flexible Deployment Options

Optimized Business System

Fast to install and run

e.g. IBM Smart Analytics System, Cognos Now!

Virtualization

Optimize use or resources

e.g. Support for VMWare, Linux on System z

Private Cloud

Standardize & share costs

e.g. Support for Linux on System z

Enterprise Software

Leverage existing IT investment

e.g. IBM Cognos 8 BI on supported OS and hardware of choice

Managed, Community, Public Clouds

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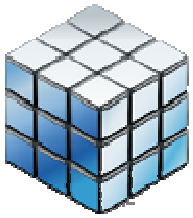
Other BI Offerings

IBM Cognos Now!

- Real-time, consolidated view of key business drivers such as SLA compliance, call center agent utilization, resolution performance, call metrics, customer satisfaction

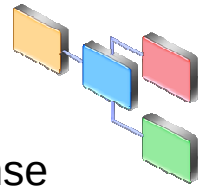
IBM Cognos TM1

- High performance in-memory cache for BI (e.g. reporting, analysis, dashboarding…)



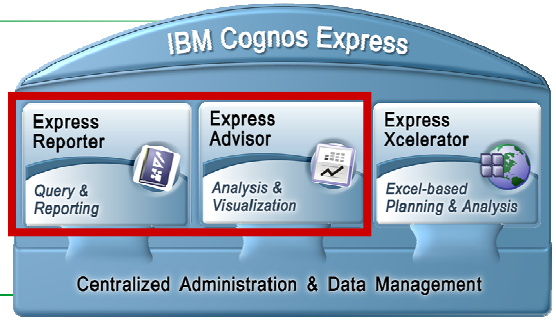
IBM Cognos 8 Business Viewpoint

- Business dimension management; enables users to shape and view information in a way that makes sense to them, with IT/Finance governance/control



IBM Cognos Express

- Integrated reporting, analysis and planning, solution purpose built and priced for midsize companies



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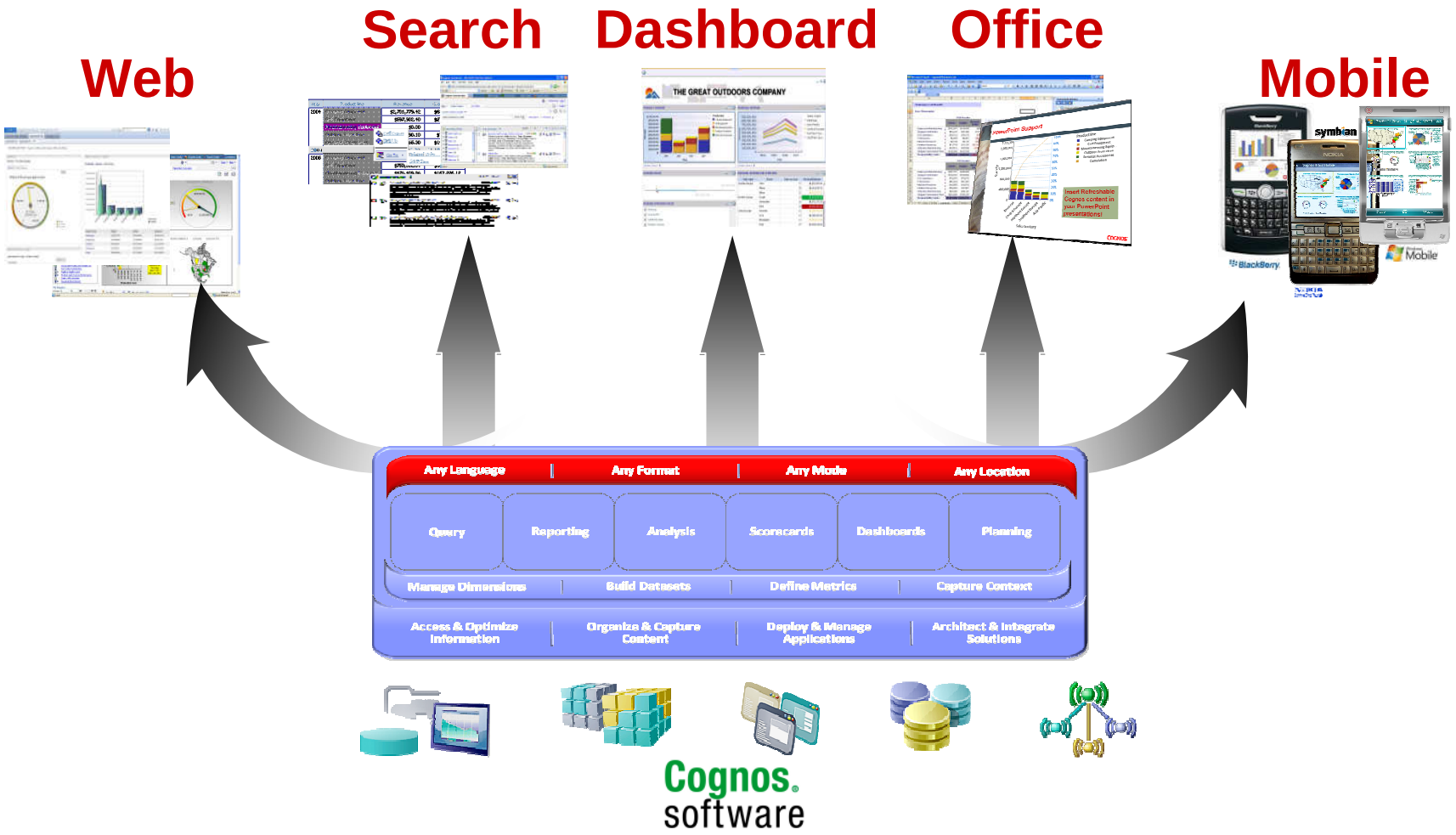
Extend Your BI !

Make Decision-Making Part of Everyday Life



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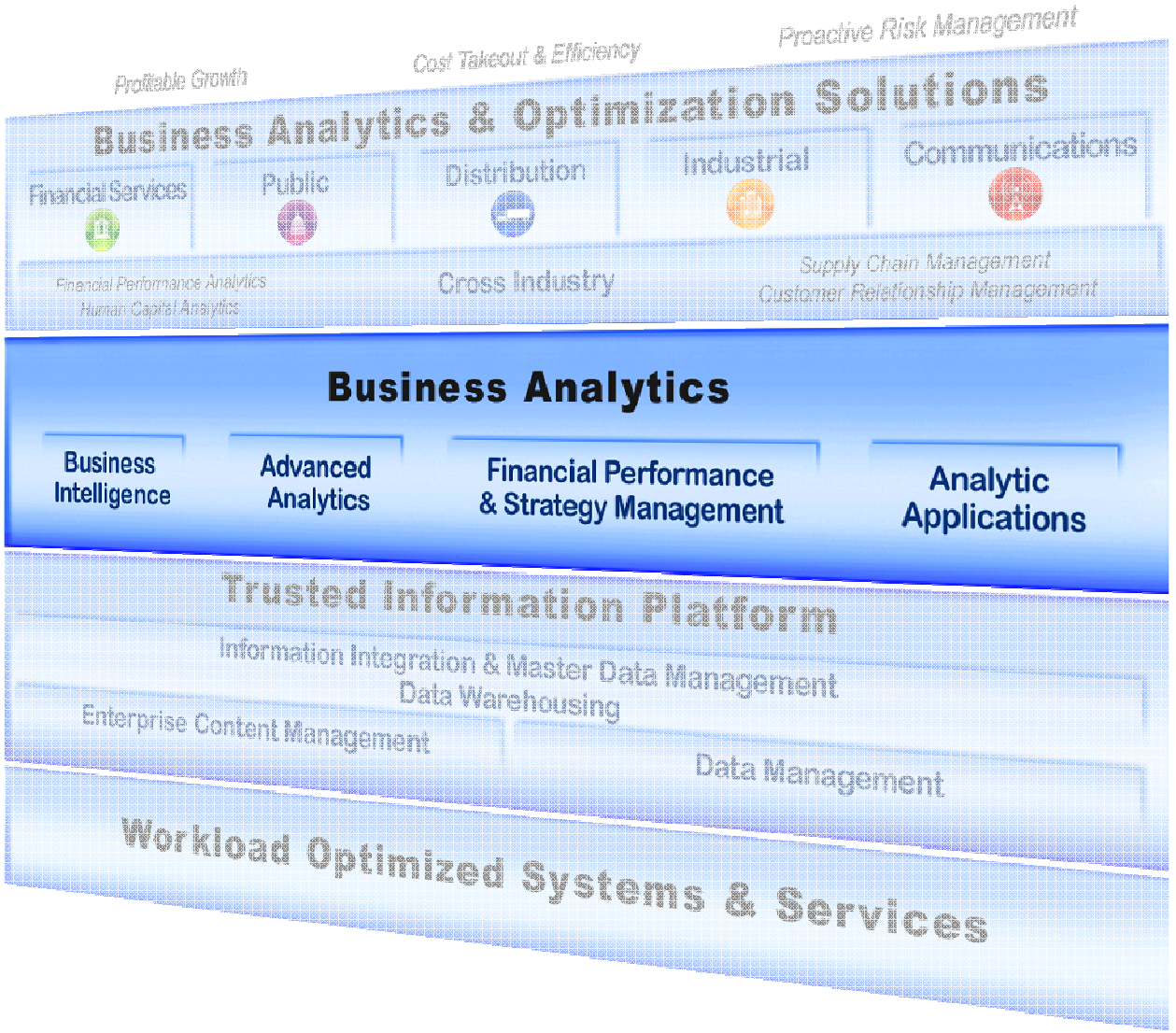
Advanced Analytics

Cognos software

SPSS AN IBM® COMPANY



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Advanced Analytics

Data mining, predictive modelling, 'what if' scenario analysis, statistics, and text analytics to identify meaningful patterns and correlations in data sets to predict future events and assess the attractiveness of various courses of action

Who's concerned?: Business leaders, analytical professionals and **IT**

Top pain points:

- Cannot capture/analyze **customer sentiment and opinions** (unstructured data: surveys, e-mails, call center notes, blogs…)
- Finding **key patterns, correlations and trends** in data to **predict outcomes**
- **Broad distribution** of predictive and statistical insights throughout decision making processes across the organization

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Lead Offering: IBM SPSS Predictive Analytics

- ***Capture***
- ***Predict***
- ***Act***

- **SPSS Data Collection –** Survey capabilities to capture behaviors and attitudes for customers, employees or constituents
- **SPSS Statistics –** Advanced statistics for the collection, preparation, analysis, interpretation, explanation and presentation of data
- **SPSS Modeler –** Predictive modeling environment with set of mining algorithms that provide insight and prediction
- **SPSS Text Analytics –** Uses natural language processing, heuristic rules and statistical techniques to reveal conceptual meaning in text
- **SPSS Decision Management –** Injects powerful predictive analytics into core business processes to automate high-volume decision making
- **SPSS Collaboration and Deployment Services –** Flexible

✓ **Attract and retain more profitable customers**
✓ **Detect and prevent fraud**
✓ **Improve resource allocation, marketing campaigns…**
✓ **Mitigate risk through a convergence of analytics, architecture, and business processes**

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Sales Analysis Dashboard - IBM Cognos 8 Go! Dashboard - Windows Internet Explorer

http://cognosd2g/cognos8/cgi-bin/cognos.cgi/gdb/cognos/dashboard/html/cm/i07182BBEEAAE42539D90BD06E9391642

File Edit View Favorites Tools Help

Sales Analysis Dashboar... | Public Folders - IBM Cognos ...

Page Tools

Go! Dashboard - Sales Analysis Dashboard

Anonymous
My Area Log On

D2G SALES ANALYSIS

TOP SELLING PRODUCTS

Top: * 3

Rank	Product Name	MBA	SEQ	Sales [$ 000]
1	Sonic DTC Digital Advance			$85,849
2	Sonic 101 DTS/ES Receiver			$47,091
3	Sonic TLR Thunder Receive			
Consumer Electronics				
1	D2G Blast Em			
2	Microsoft Xbox			
3	Sega Dreamcast			$5,632
Entertainment Media				**$37,955**
1	Computer Extended Desk			$51,852
2	Computer Desk Ultra			$41,539
3	Standard Stool			$38,477
Home Office				**$131,867**
1	Wavestation 4200 FP			$384,344

PROFITABILITY BY STATE

Product Line

Profitability by State

Profit %
46%
36%
26%
16%

Example

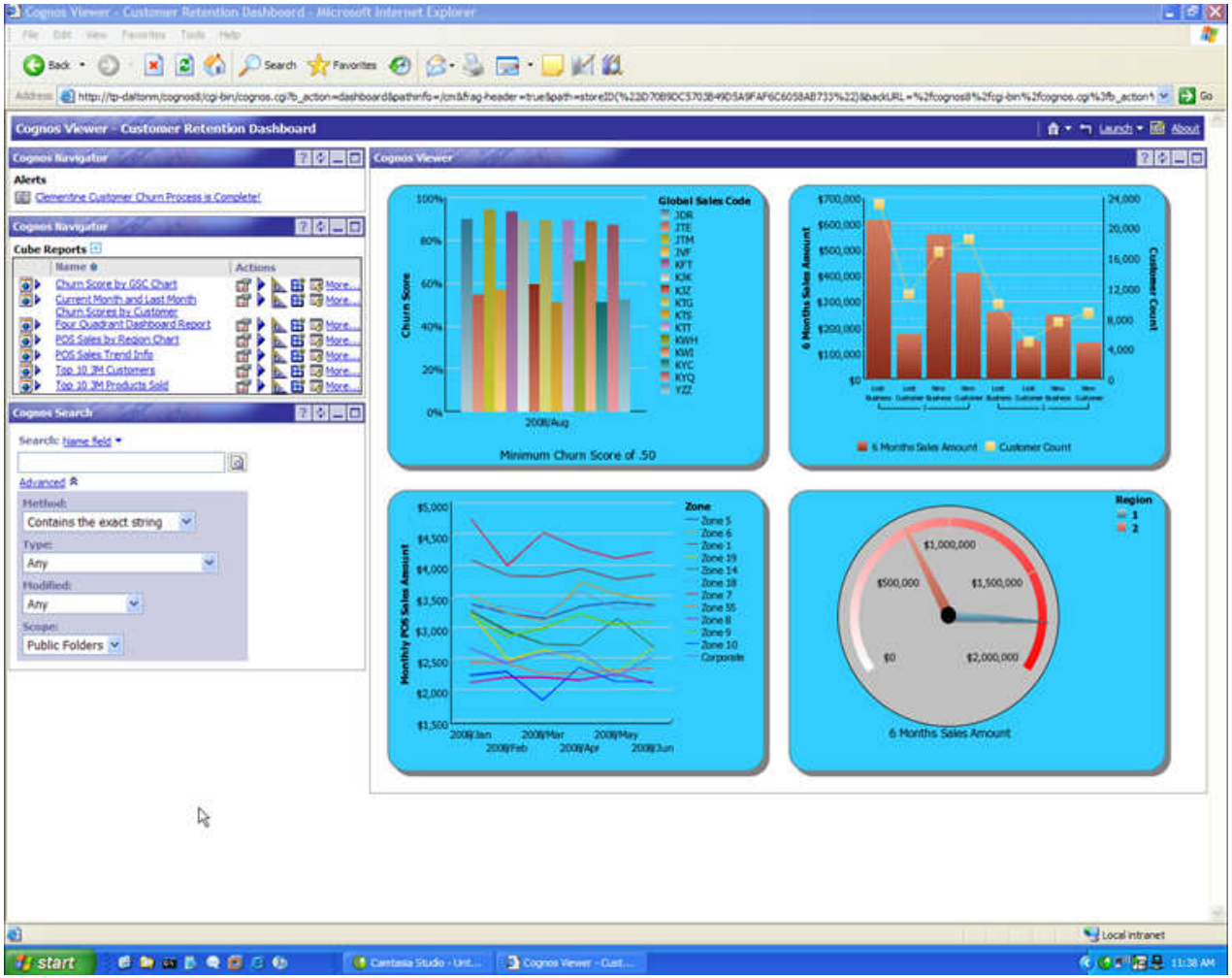
RESTRICT CUST SEGMENTCOUNTS TO...

0 18

SEGMENTATION COUNTS

NAME
Budget Shopper
Casual Shopper
Future Shopper
High Profit Shopper
High-End Shopper

Start in a Cognos dashboard



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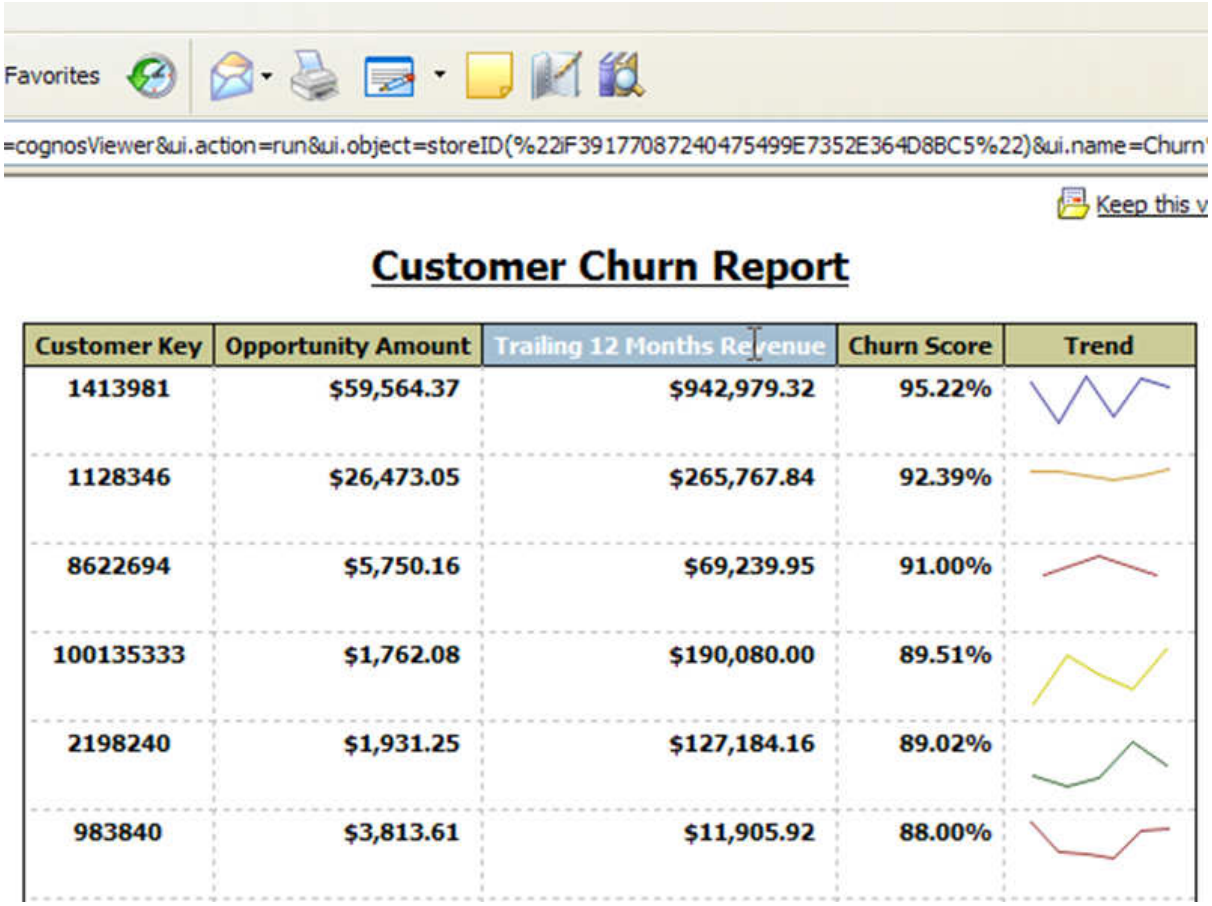
Drill, explore and understand



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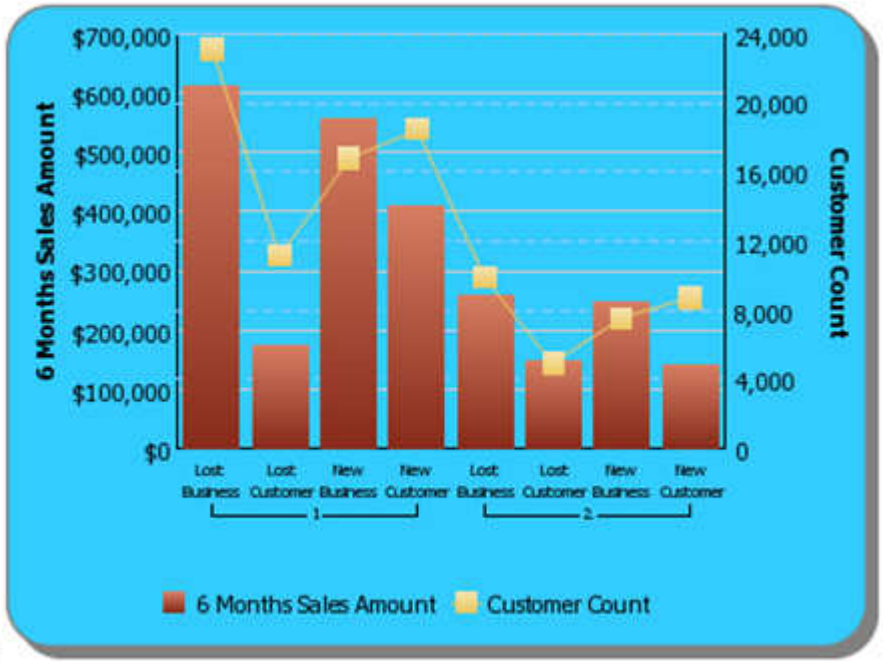
Drill, explore and understand



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Act on Alerts

Customer Key	August Churn Score	July Churn Score	August 12 Months Revenue	Churn Score Variance
1888076	92.89%	4.71%	$6,792.24	88.18%
984155	91.25%	5.19%	$26,688.04	86.06%
2109920	90.00%	5.61%	$3,180.00	84.39%
1604761	89.00%	6.05%	$1,286.93	82.95%
2531449	83.34%	2.19%	$12,890.88	81.15%
2156421	81.09%	3.20%	$22,009.53	77.90%
2155575	83.76%	5.95%	$11,313.00	77.82%
2348730	78.65%	2.11%	$7,457.18	76.54%
980906	75.65%	2.08%	$4,844.16	73.57%
2181215	71.28%	2.13%	$8,799.18	69.15%
2684304	76.99%	7.96%	$10,717.09	69.03%
1418448	76.08%	7.23%	$139,617.06	68.86%
2765567	70.18%	1.78%	$3,860.64	68.40%
2540911	88.77%	21.83%	$16,543.60	66.94%
1981422	71.83%	6.38%	$4,186.69	65.45%
1741553	70.15%	7.62%	$3,107.26	62.54%
1063011	70.46%	9.25%	$34,406.12	61.21%
2572288	63.81%	6.82%	$10,888.32	56.99%
9304010	63.81%	6.82%	$10,888.32	56.99%
2112108	63.49%	10.21%	$68,300.20	53.28%
1742846	67.81%	16.14%	$4,711.48	51.68%
9430846	82.97%	31.48%	$5,218.42	51.49%
9332556	54.43%	3.39%	$40,154.15	51.04%
100160209	54.43%	3.39%	$40,154.15	51.04%

Done

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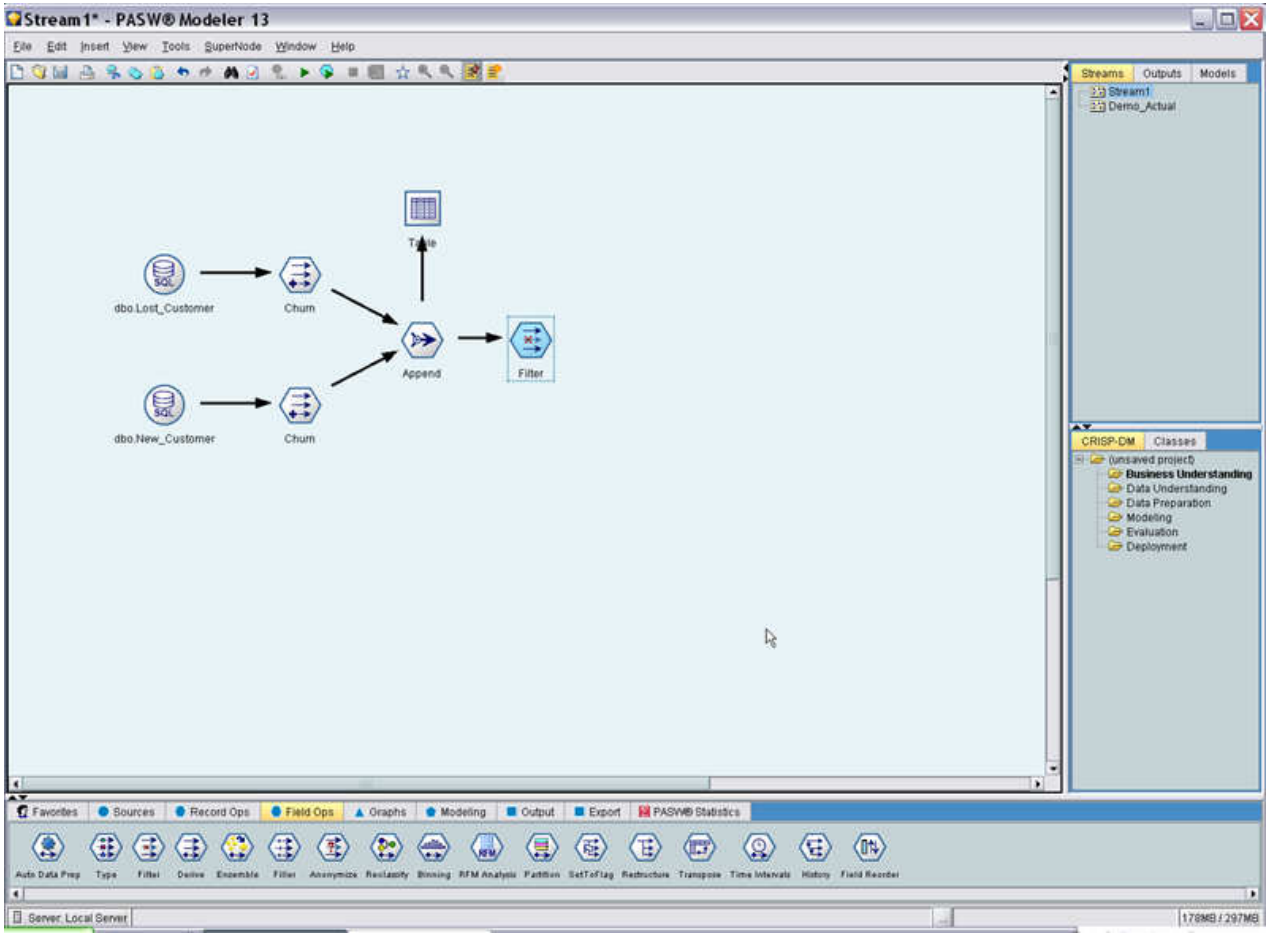
Read in Cognos data, flag and append



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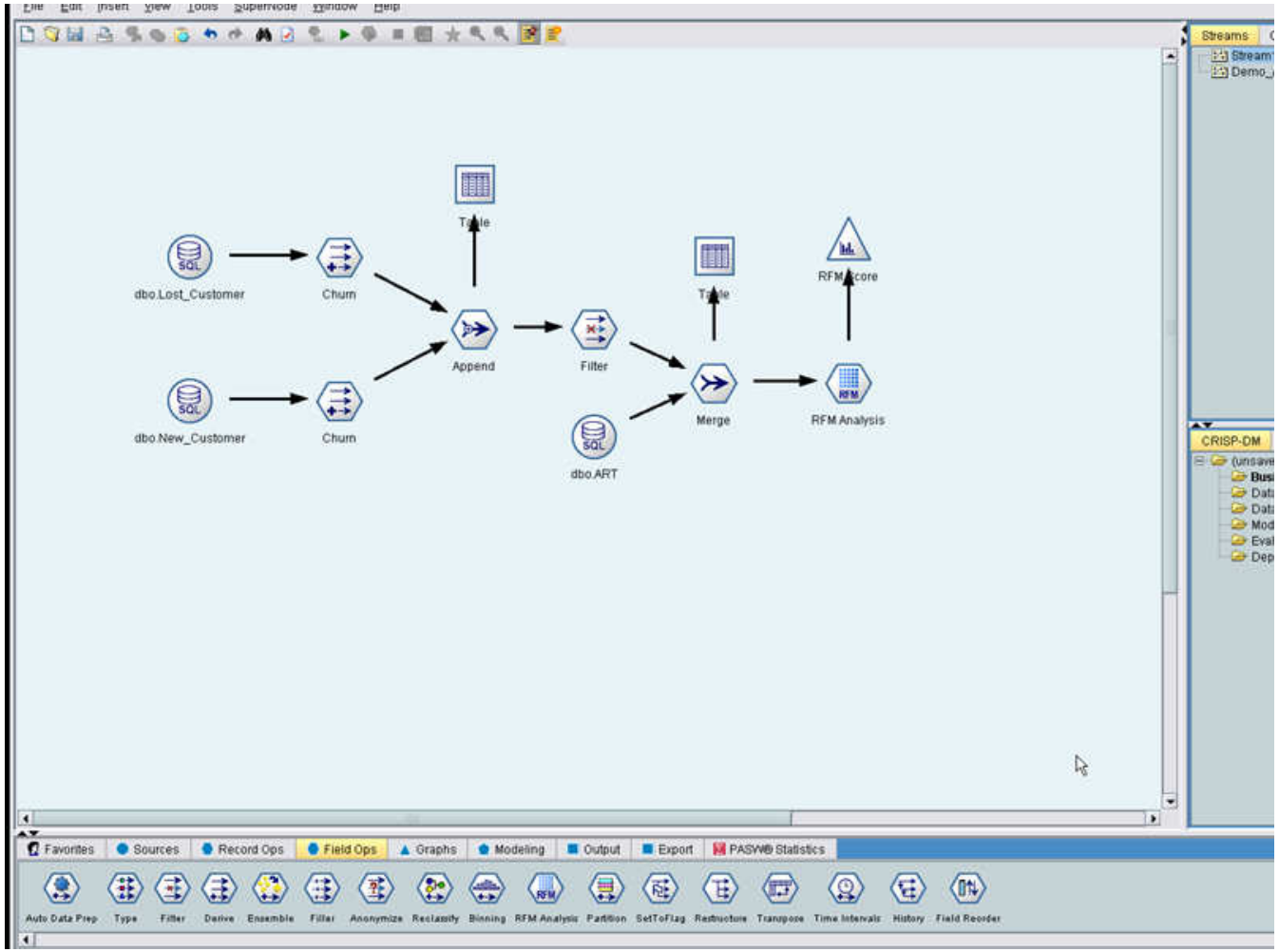
Score data for RFM



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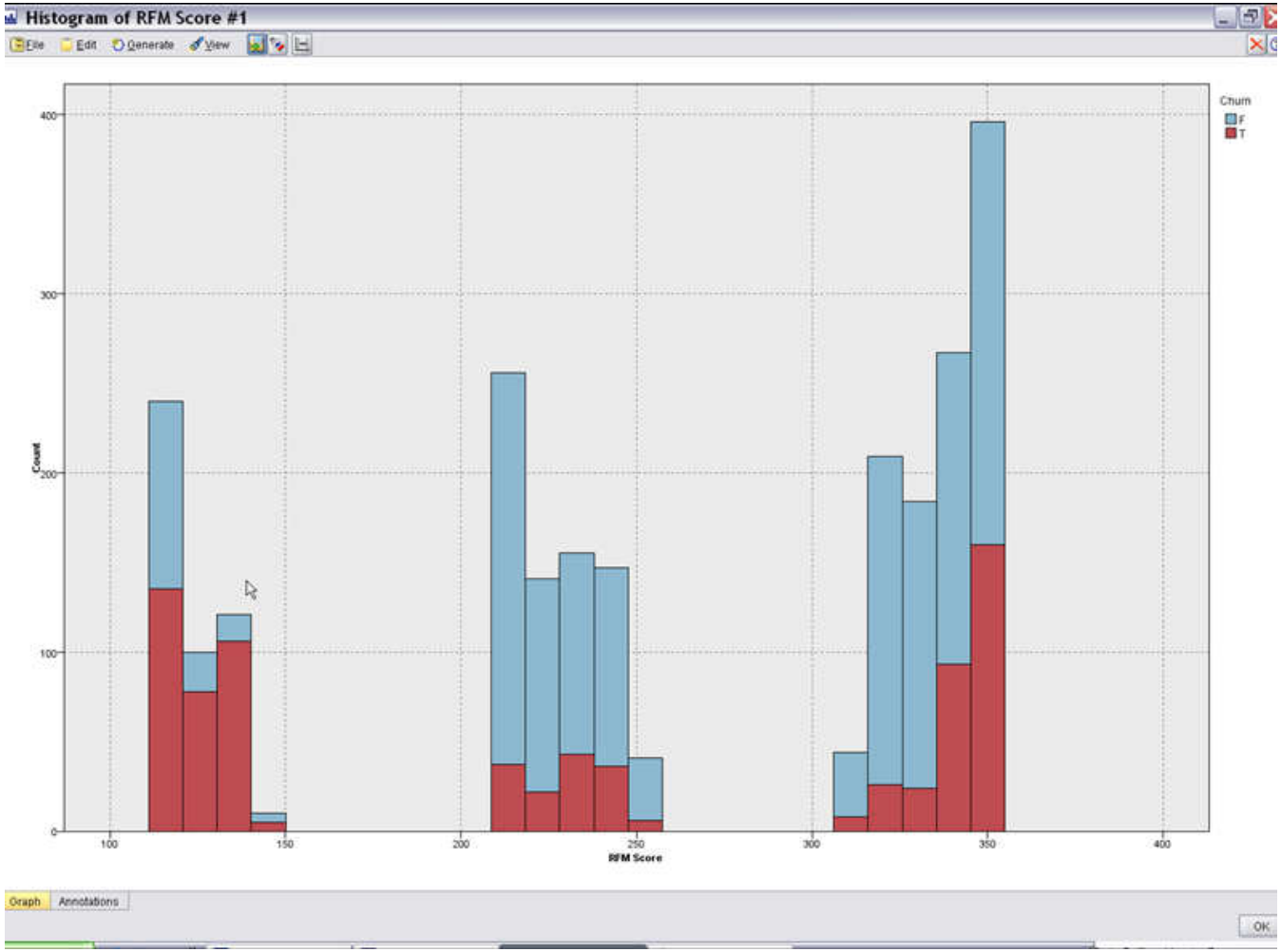
RFM vs Churn



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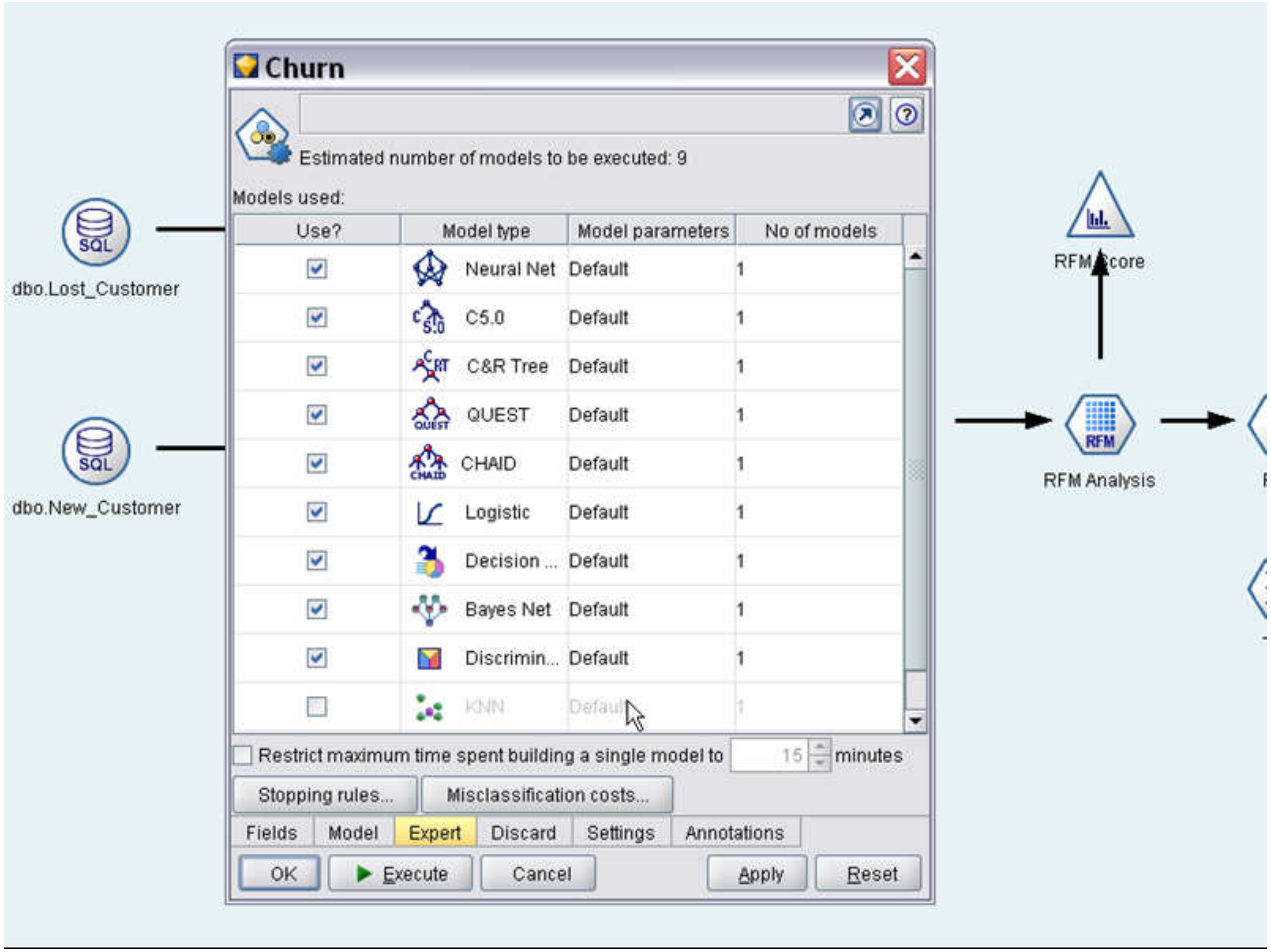
Apply Auto Classifier



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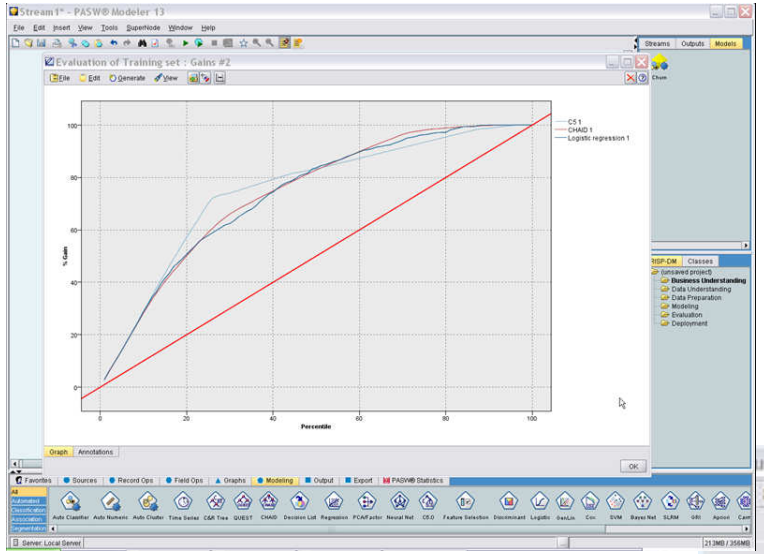
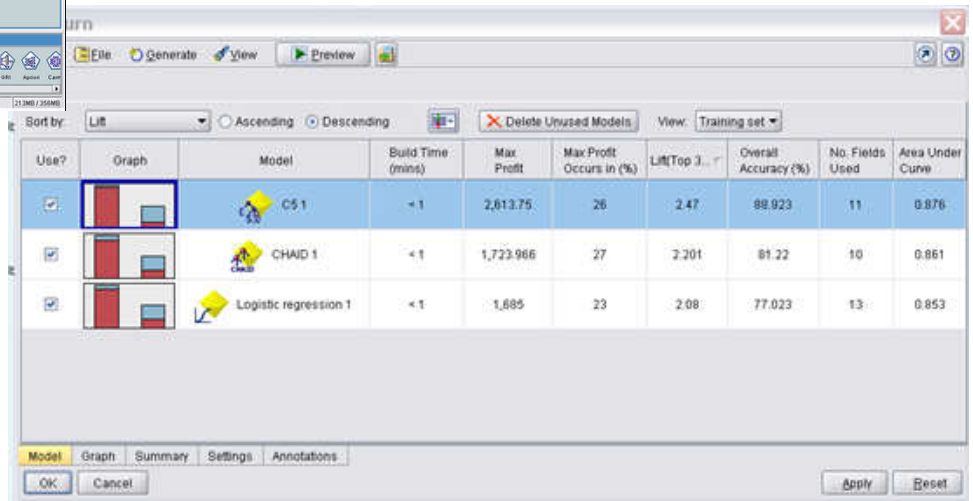
Assess results





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Churn Scores Predicted !

Table (18 fields, 2,311 records) #1

File Edit Generate

	8 Mnths)	Avg Mnths Between Purch	SALES_AMT	Region	Zone	Churn	Recency Score	Frequency Score	Monetary Score	RFM Score	$XF-Churn	$XFC-Churn
1	4	2.000	7620.480	1	6	F	2	2	2	222.000	F	0.863
2	5	4.000	7629.120	1	55	F	2	2	4	224.000	F	0.863
3	6	2.800	6037.020	1	55	F	2	3	3	233.000	F	0.863
4	5	3.250	2323.100	1	55	F	3	2	2	322.000	F	0.863
5	14	1.231	4353.490	1	55	F	2	4	3	243.000	F	0.921
6	14	1.231	599.760	1	55	F	2	4	3	243.000	F	0.921
7	14	1.231	676.220	1	55	F	2	4	3	243.000	F	0.921
8	6	1.200	17670.240	1	4	T	1	3	2	132.000	T	0.975
9	3	2.500	6264.000	1	6	T	1	1	4	114.000	T	0.975
10	15	1.214	281.280	1	4	T	3	5	5	355.000	F	0.719
11	6	1.800	97.040	1	4	T	1	3	5	135.000	F	0.719
12	10	1.222	305.280	1	4	T	3	4	4	344.000	T	0.857
13	10	1.222	147.360	1	4	T	3	4	4	344.000	T	0.857
14	12	1.455	124.080	1	4	T	2	4	5	245.000	T	0.829
15	7	2.500	4615.920	1	55	F	2	3	3	233.000	F	0.921
16	7	2.500	4482.000	1	55	F	2	3	3	233.000	F	0.921
17	8	1.000	2606.400	1	55	F	3	3	5	335.000	F	0.921
18	8	1.000	4693.240	1	55	F	3	3	5	335.000	F	0.921
19	8	1.000	18772.960	1	55	F	3	3	5	335.000	F	0.921
20	16	1.067	36001.020	1	4	F	2	5	4	254.000	F	0.822

Table Annotations

OK

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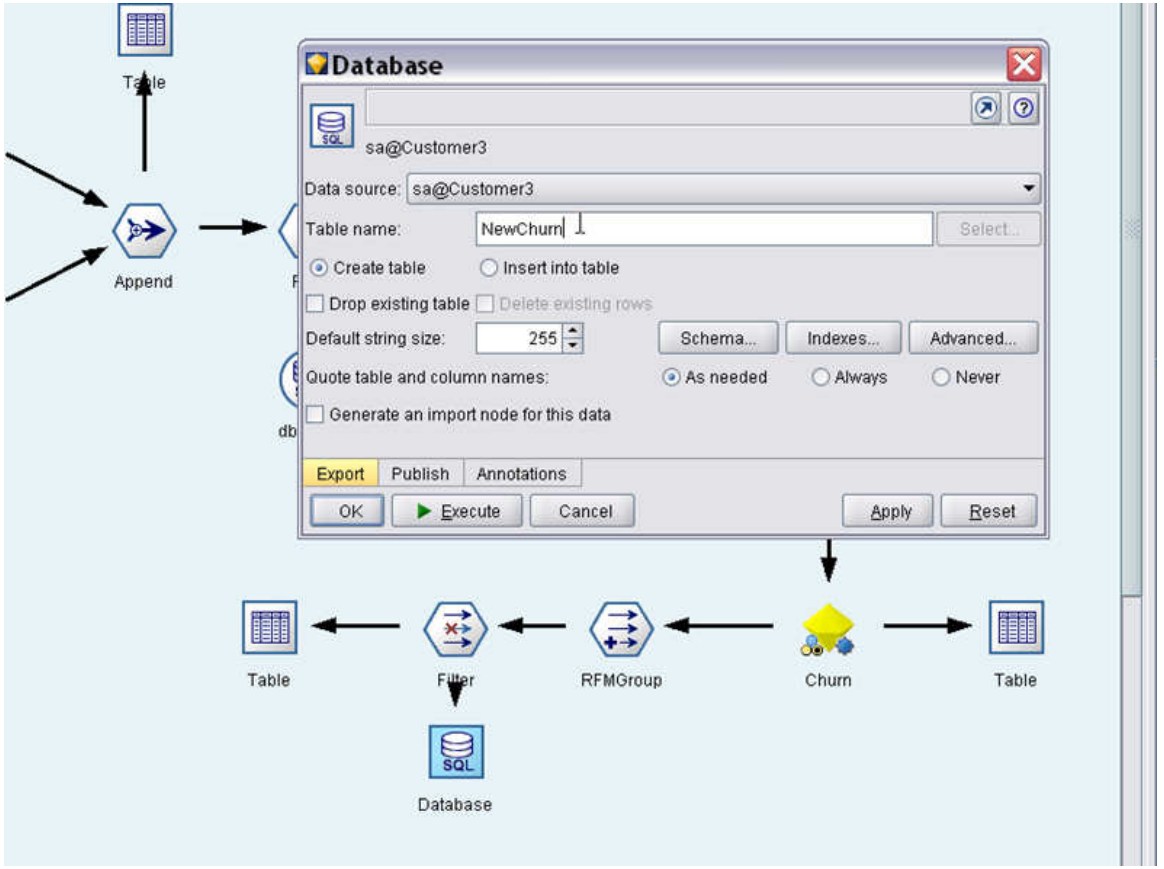
Return new data to database



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Evaluate RFM and Churn in Cognos

Customer Churn Report

RFM Group	Customer Key	Opportunity Amount	Trailing 12 Months Revenue	Churn Score	Trend
High	9324480	$125,439.03	$1,342,854.72	10.24%	
High	1399218	$21,387.27	$321,859.20	2.47%	
High	2903324	$12,054.53	$174,563.70	1.96%	
High	2369499	$19,449.88	$191,835.00	1.86%	
High	985037	$2,472.22	$44,408.64	1.68%	
Medium	1413981	$59,564.37	$942,979.32	95.22%	
Medium	1128346	$26,473.05	$265,767.84	92.39%	
Medium	8622694	$5,750.16	$69,239.95	91.00%	
Medium	100135333	$1,762.08	$190,080.00	89.51%	
Medium	2198240	$1,931.25	$127,184.16	89.02%	

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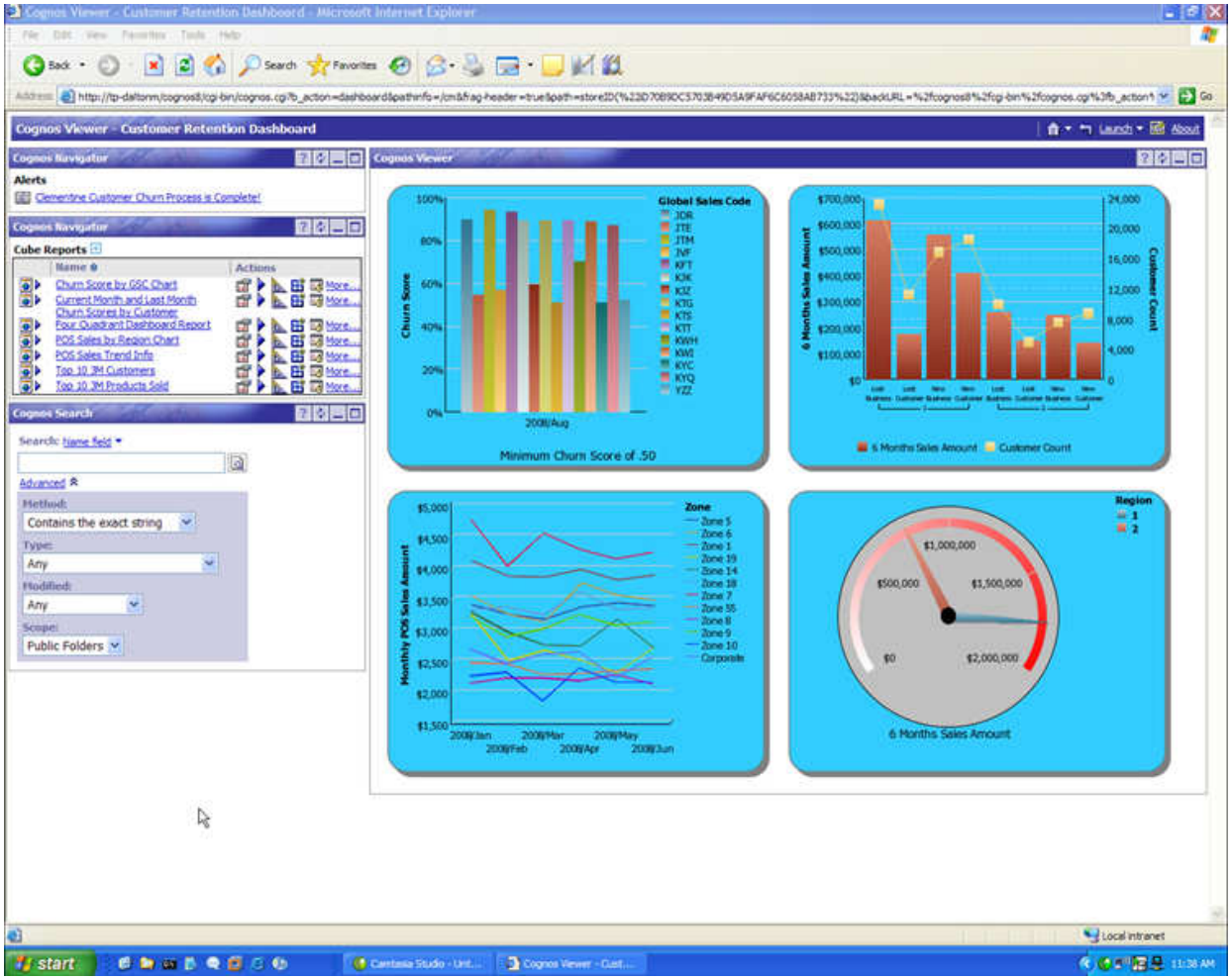
Add predictive indicators to your dashboard



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