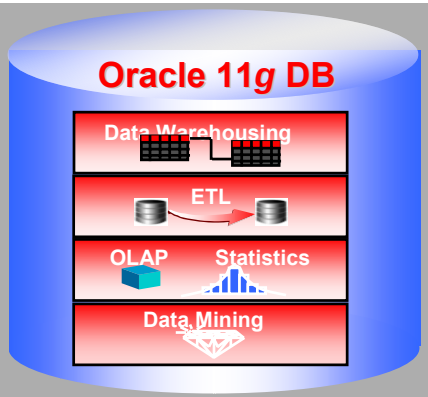
ORACLE 11g DATABASE



Predictive Analytics Using
Oracle Data Mining,
Oracle BI EE …and More!

ORACLE

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The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions.
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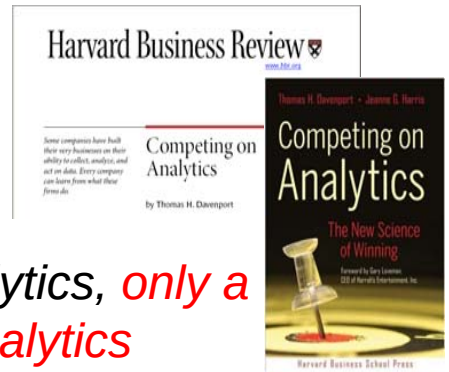
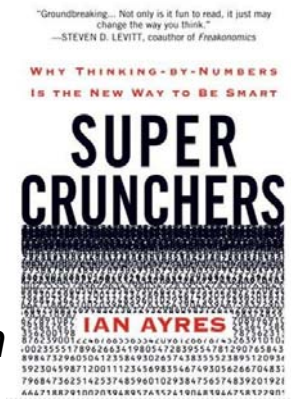
Outline

- Today's BI must go beyond simple reporting
- To succeed, companies must
  - Eliminate data movement
  - Collapse information latency
  - Deliver better BI through analytics
- Oracle Data Mining transforms the Database to an "*Analytical* Database"
  - Enables applications *"Powered by Oracle Data Mining"*
- Brief demonstrations
  1. Oracle Data Mining + OBI EE
  2. OOW 2008 Schedule Builder
  3. Oracle Sales Prospector
  4. HCM Application

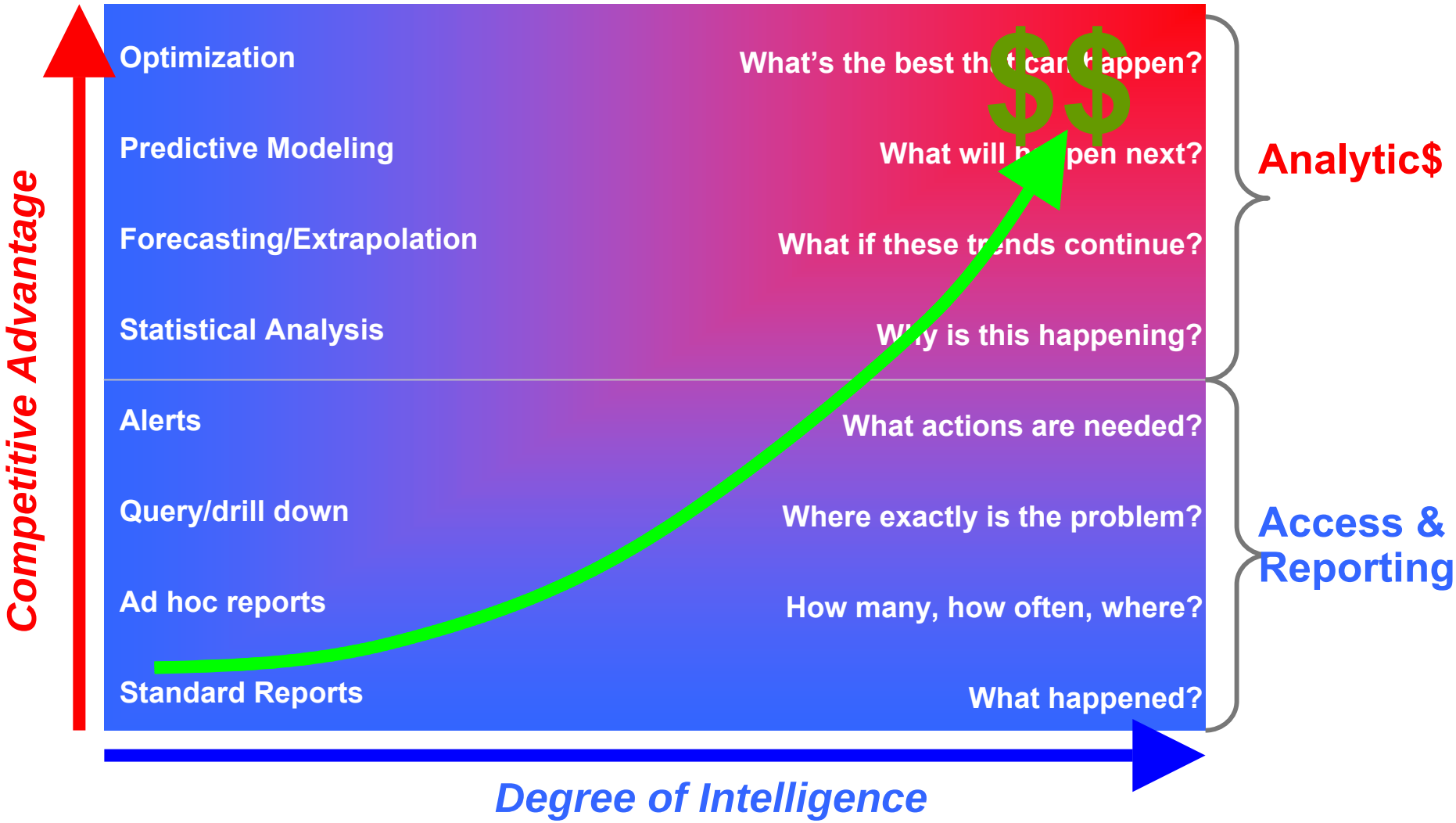
Analytics: Strategic and Mission Critical



- *Competing on Analytics, by Tom Davenport*
  - *"Some companies have built their very businesses on their ability to collect, analyze, and act on data."*
  - *"Although numerous organizations are embracing analytics, only a handful have achieved this level of proficiency. But analytics competitors are the leaders in their varied fields—consumer products finance, retail, and travel and entertainment among them."*
  - *"Organizations are moving beyond query and reporting"* - IDC 2006
- *Super Crunchers, by Ian Ayers*
  - *"In the past, one could get by on intuition and experience. Times have changed. Today, the name of the game is data."* —Steven D. Levitt, author of *Freakonomics*
  - *"Data-mining and statistical analysis have suddenly become cool.... Dissecting marketing, politics, and even sports, stuff th complex and important shouldn't be this much fun to read."* —*Wired*



Competitive Advantage

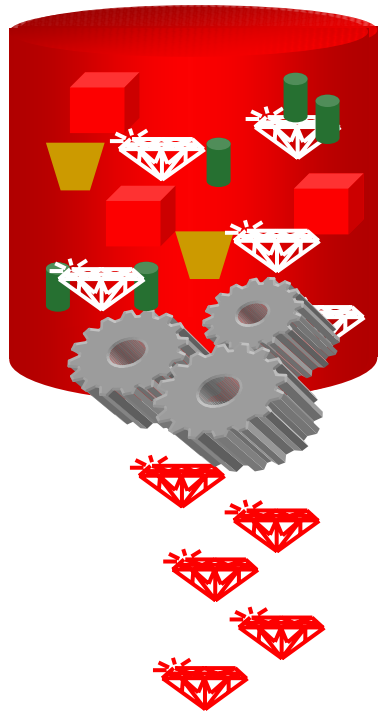


Source: Competing on Analytics, by T. Davenport & J. Harris

Oracle Data Mining Option

What is Data Mining?

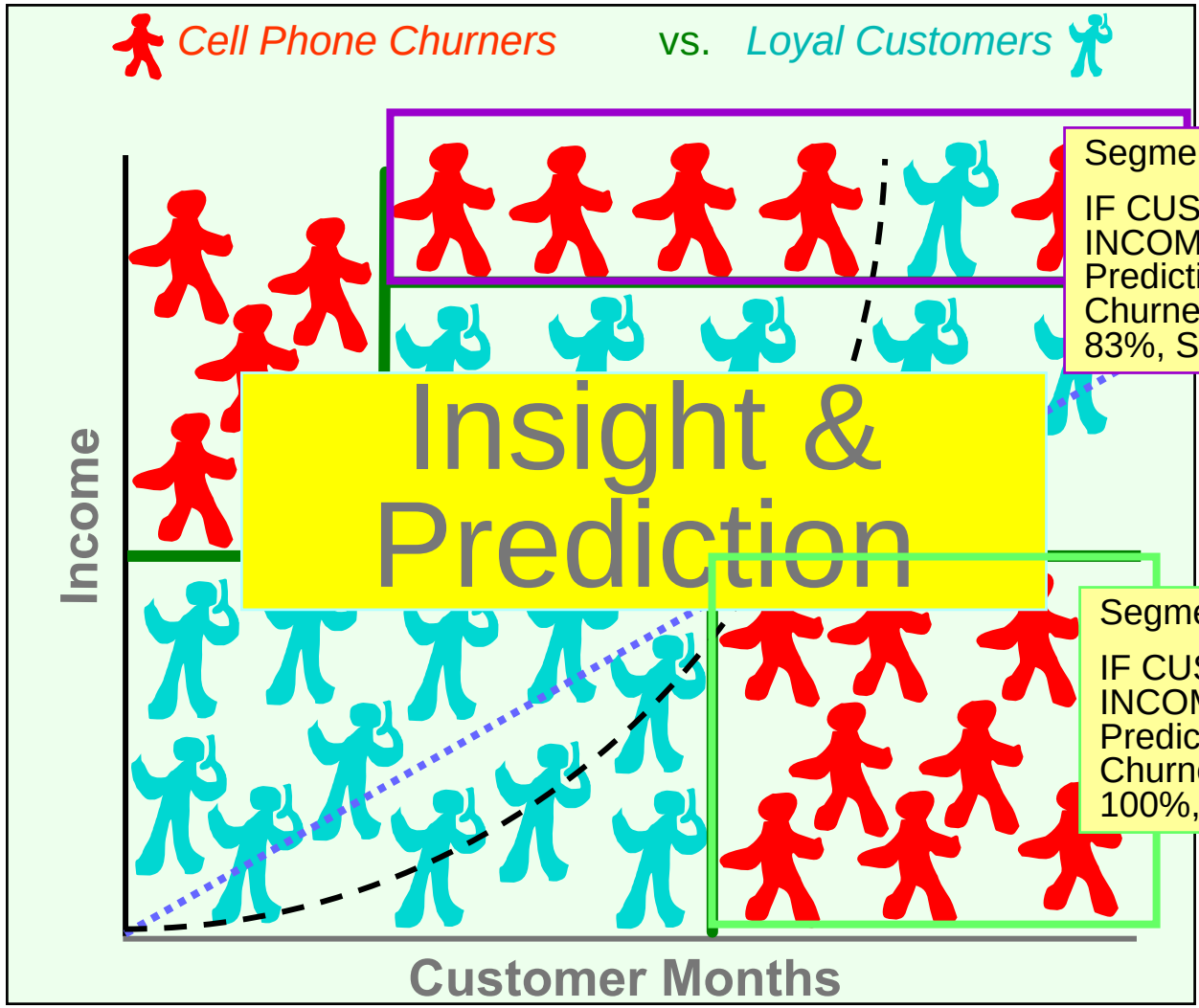
ORACLE DATABASE 11g



- Automatically sifts through data to find hidden patterns, discover new insights, and make predictions
- Data Mining can provide valuable results:
  - Predict customer behavior *(Classification)*
  - Predict or estimate a value *(Regression)*
  - Segment a population *(Clustering)*
  - Identify factors more associated with a business problem *(Attribute Importance)*
  - Find profiles of targeted people or items *(Decision Trees)*
  - Determine important relationships and “market baskets” within the population *(Associations)*
  - Find fraudulent or “rare events” *(Anomaly Detection)*

Data Mining Provides

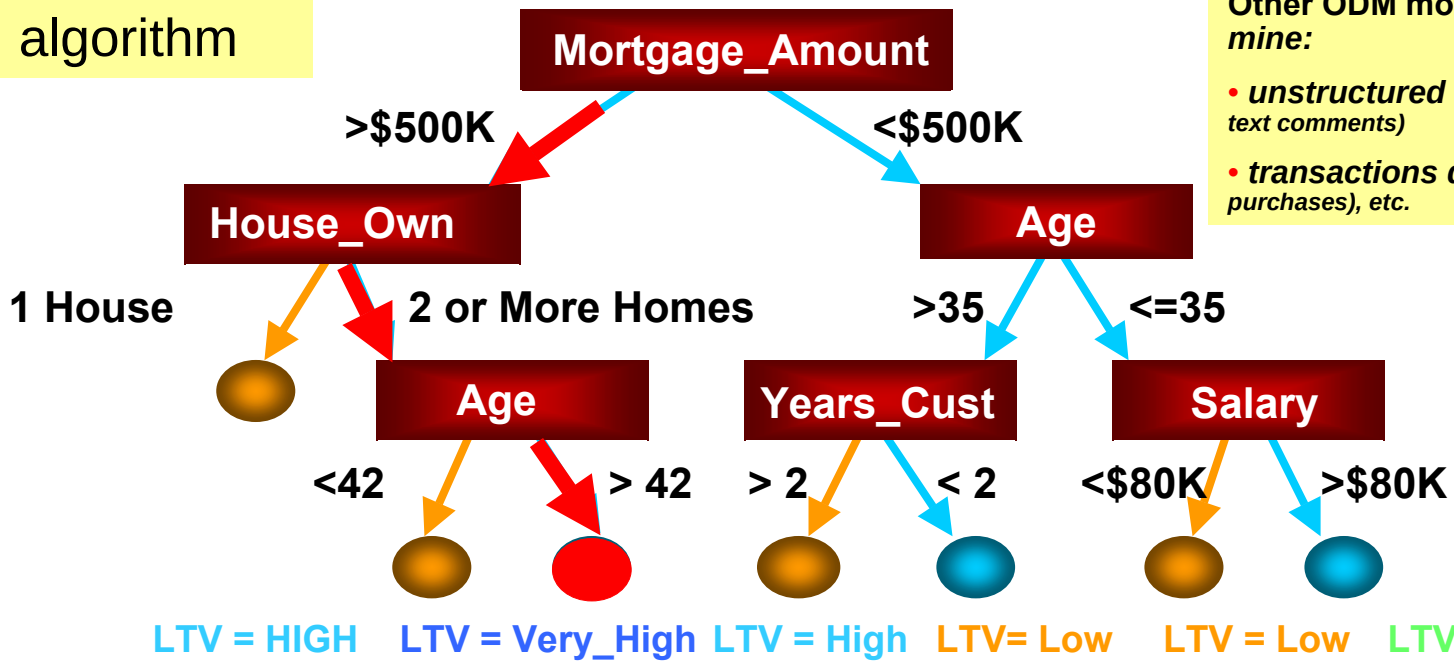
Better Information, Valuable Insights and Predictions



Source: Inspired from *Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management* by Michael J. A. Berry, Gordon S. Linoff

Predicting High LTV Customers

Decision Tree algorithm



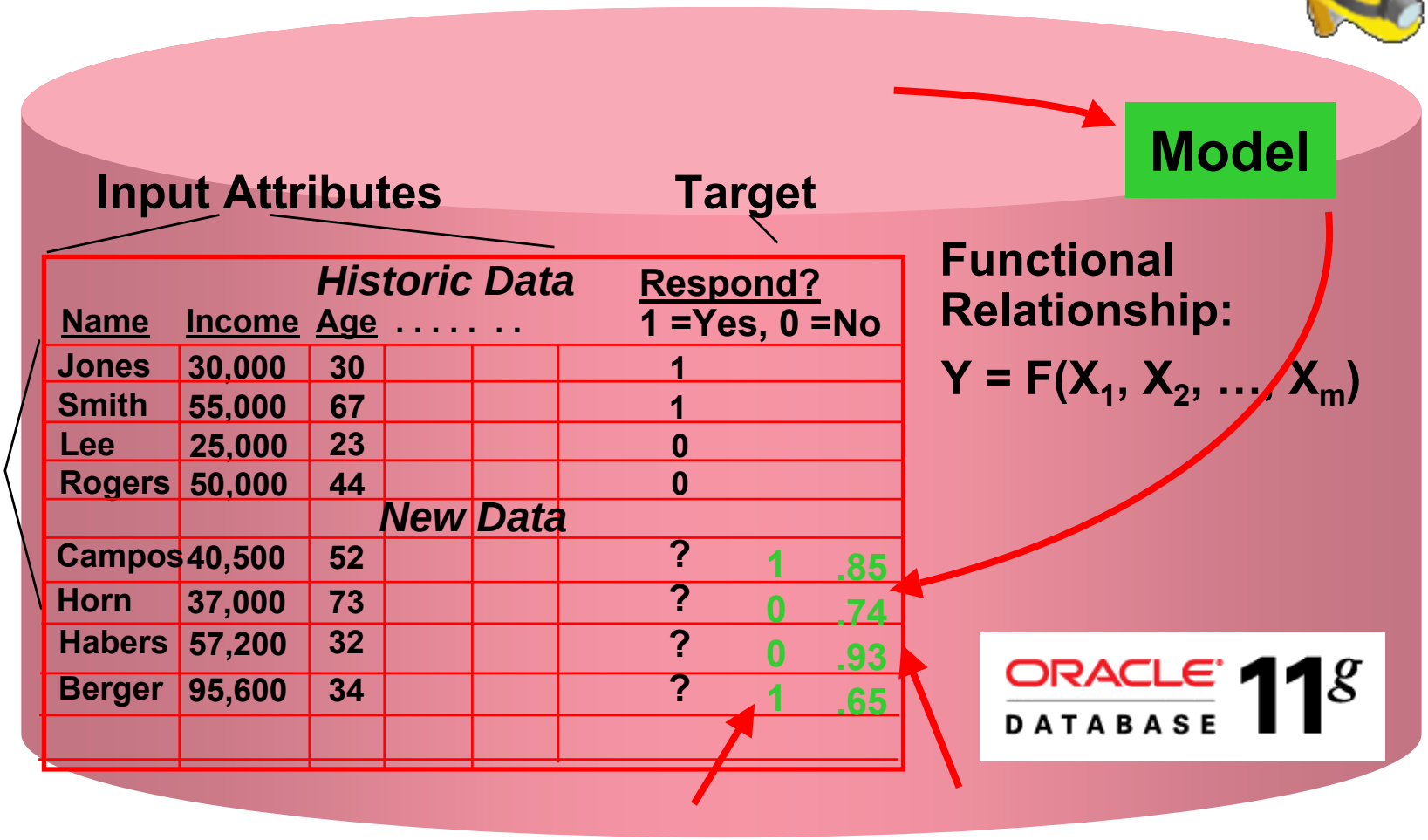
Simple model:
Other ODM models can *mine:*

- ***unstructured data** (e.g. text comments)*
- ***transactions data** (e.g. purchases), etc.*

IF (Mortgage_Amount > $500K AND House_Own = 2 or more AND Age = >42)
THEN Probability(Lifetime Customer Value is "VERY HIGH" = 77%, Support = 15%

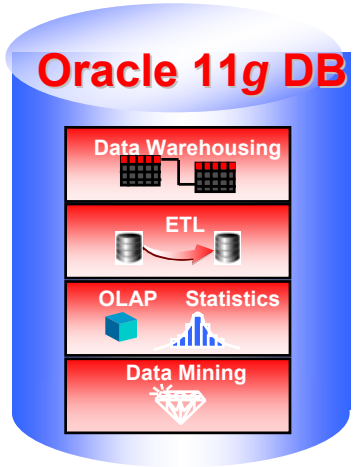
Oracle Data Mining

Overview (Classification)



In-Database Data Mining

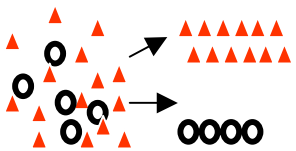
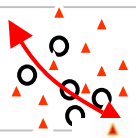
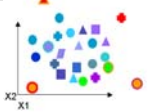
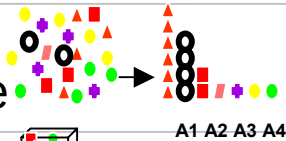
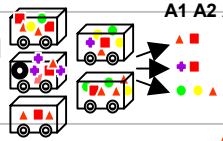
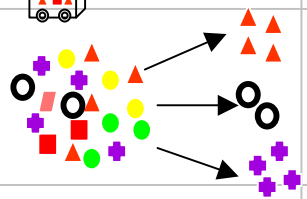
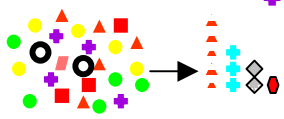
Advantages



- ODM architecture provides greater
  - Performance, scalability, and data security
- Data remains in the database
  - Fewer moving parts; shorter information latency
- Straightforward inclusion within interesting and arbitrarily complex queries
- Real-world scalability—available for mission critical appls
- Enables pipelining of results without costly materialization
- Performant and scalable:
  - Fast scoring: 2.5 million records scored in 6 seconds on a single CPU system
  - Real-time scoring: 100 models on a single CPU: 0.085 seconds

Oracle Data Mining

Algorithm Summary 11g

Problem	Algorithm	Applicability
Classification 	**Logistic Regression (GLM)** **Decision Trees** **Naïve Bayes** **Support Vector Machine**	**Classical statistical technique** **Popular / Rules / transparency** **Embedded app** **Wide / narrow data / text**
Regression 	**Multiple Regression (GLM)** **Support Vector Machine**	**Classical statistical technique** **Wide / narrow data / text**
Anomaly Detection 	**One Class SVM**	**Lack examples**
Attribute Importance 	**Minimum Description Length (MDL)**	**Attribute reduction** **Identify useful data** **Reduce data noise**
Association Rules 	**Apriori**	**Market basket analysis** **Link analysis**
Clustering 	**Hierarchical K-Means** **Hierarchical O-Cluster**	**Product grouping** **Text mining** **Gene and protein analysis**
Feature Extraction 	**NMF**	**Text analysis** **Feature reduction**

Oracle Data Mining and Unstructured Data

- Oracle Data Mining mines unstructured i.e. “text” data
- Include free text and comments in ODM models
- Cluster and Classify documents
- Oracle Text used to preprocess unstructured text

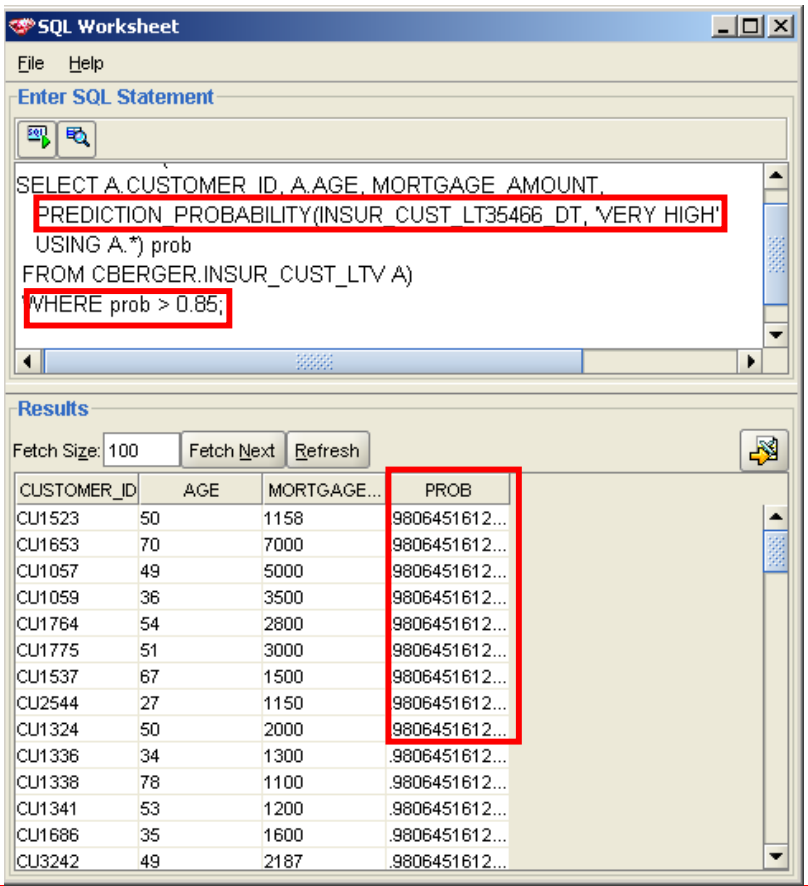
Structure | Data

Fetch Size: 100 | Fetch Next | Refresh

CUST_ID	AFFINITY_CARD	AGE	CU..	COMMENTS	CUST_MARI...
101501	0	41	F	Shopping at your store is a hassle. I rarely shop there and usually forget to bring your new loyalty c...	NeverM
101502	0	27	M	Affinity card is great. I think it is a hassle to have to remember to bring it in every time though.	NeverM
101503	0	20	F	I purchased a new computer recently, but the manuals weren't included. Could you ship them to me ..	NeverM
101504	1	45	M	Affinity card is great. I think it is a hassle to have to remember to bring it in every time though.	Married
101505	1	34	M	Why didn't you start a program like this before? Everyone else has been offering discounts like this f..	NeverM
101506	0	38	M	Forget it. I 'm not giving you all my personal information. I wish you'd give up and respect a customer..	Married
101507	0	28	M	It is a good way to attract new shoppers. After shopping at your store for more than a month, I am r...	Married
101508	0	19	M	I shop your store a lot. I love your weekly specials.	NeverM
101509	0	52	M	Affinity card makese sense only for bulk purchases. For all others, driving so far is not worth the di...	Married
101510	1	27	M	Could you send an Affinity Card to my mother in France? Let me know and I'll send you here address.	NeverM
101511	0	30	M	Shopping at your store is a hassle. I rarely shop there and usually forget to bring your new loyalty c...	NeverM
101512	0	30	F	The new affinity card is great. Thank you. I do have to say that it is a hassle to remember to bring it ...	NeverM
101513	0	31	M	Thanks but even with your discounts, your products are too expensive. Sorry.	Married
101514	0	45	M	Affinity card is great. I think it is a hassle to have to remember to bring it in every time though.	NeverM
101515	0	36	F	I purchased the new mouse pads and love them. I also purchased one for my sister and one for my ...	NeverM
101516	0	33	M	Don't send me any more promotions. I get too much lousy junk mail already	Married
101517	0	38	F	Shopping at your store is a hassle. I rarely shop there and usually forget to bring your new loyalty c...	NeverM
101518	0	22	M	Don't send me any more promotions. I get too much lousy junk mail already	NeverM
101519	0	46	F	Shopping at your store is a hassle. I rarely shop there and usually forget to bring your new loyalty c...	Divorc.
101520	1	39	M	Affinity card is great. I think it is a hassle to have to remember to bring it in every time though.	Married
101521	0	61	M	I shop your store a lot. I love your weekly specials.	Married
101522	1	39	F	If I forget my affinity card, can I still shop here and get the discount?	NeverM
101523	0	22	M	A great program but I have to complain just a bit. Why do you need to know how many children I hav...	Mabsent
101524	0	38	M	Thank you, But please remove my name from your list.	Married
101525	0	18	F	My brother uses the affinity card a lot. I think the competitor has better prices without it.	NeverM

Example: Simple, Predictive SQL

- Select customers who are more than 85% likely to be HIGH VALUE customers & display their AGE & MORTGAGE_AMOUNT




```
SELECT * from(
SELECT A.CUSTOMER_ID, A.AGE,
  MORTGAGE_AMOUNT,PREDICTION_PROBABILITY
  (INSUR_CUST_LT35466_DT, 'VERY HIGH'
   USING A.*) prob
 FROM CBERGER.INSUR_CUST_LTV A)
 WHERE prob > 0.85;
```

HCM Prediction

```
drop table HCM_SET;
exec dbms_data_mining.drop_model('HCMMODEL');

create table HCM_SET (setting_name varchar2(30), setting_value varchar2(4000));
insert into HCM_SET values ('ALGO_NAME','ALGO_SUPPORT_VECTOR_MACHINES');
insert into HCM_SET values ('PREP_AUTO','ON');
commit;
```

```
begin
dbms_data_mining.create_model('HCMMODEL', 'CLASSIFICATION',
  'EMPL_DATA', 'EMPL_ID', 'CURR_EMPL', 'HCM_SET');
end;
/
```

```
-- accuracy (per-class and overall)
col actual format a6
select actual, round(corr*100/total,2) percent, corr, total-corr incorr, total from
(select actual, sum(decode(actual,predicted,1,0)) corr, count(*) total from
(select CURR_EMPL actual, prediction(HCMMODEL using *) predicted
from EMPL_DATA_JUNE07)
group by rollup(actual));
```

```
-- top 5 very high value, current employees most likely to leave
select * from
(select empl_id, round(prob_leave*100,2) percent_leave,
     rank() over (order by prob_leave desc) rnk from
(select empl_id, prediction_probability(HCMMODEL, 'NO' using *) prob_leave
from EMPL_DATA_JUNE07
where CURR_EMPL = 'YES' and LTV_BIN = 'VERY HIGH'))
where rnk <= 5
order by percent_leave desc;
```

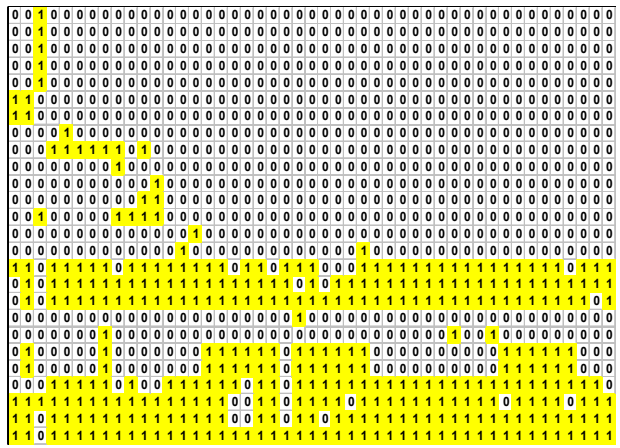
```
ACTUAL PERCENT   CORR       INCORR     TOTAL
------ --------- ---------- ---------- ----------
NO     84.04     3133       595        3728
YES    80.61     8159       1963       10122
       81.53     11292      2558       13850
Elapsed: 00:00:01.51
SQL>
```

```
 EMPL_ID    PERCENT_LEAVE  RNK
 ---------- -------------- ----------
 772858     96.84          1
 775441     95.65          2
 777992     92.1           3
 773473     91.51          4
 771813     90.21          5
 Elapsed: 00:00:00.29
 SQL>
```

Identify Management Mining

- Business Problem:
  - Identify roles from a set of users and privileges
  - Identify people that should and should not have a role
- Data Mining Technique(s):
  - Non-Negative Matrix Factorization, Clustering, Decision Trees, SQL
- Data
  - 2,721 unique privileges
  - 10,120 unique people
  - 1.18 million privilege-people pairs
- Results
  - 260 roles (compared with thousands in their previous approach)
  - ~ 3 min (linear scaling approach)
  - No loss or gain of privileges

Original “randomly”organized data - 23 roles

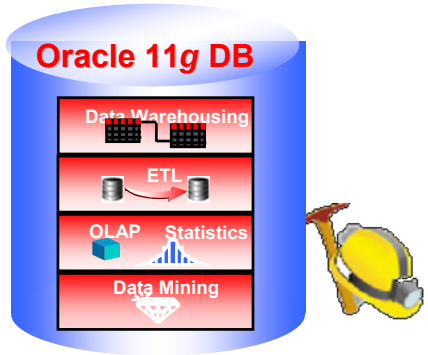


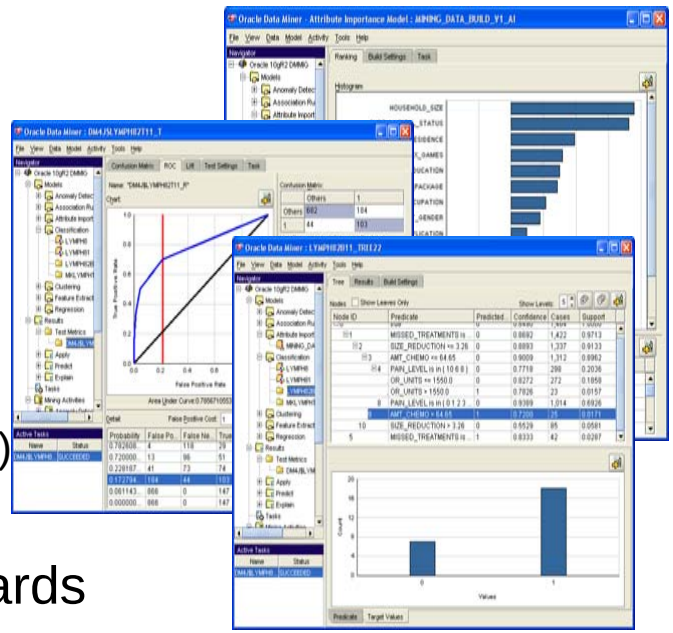
NMF organized Data - 15 roles

Roles created using row correlation (SQL)

Oracle Data Mining 11g

- Data Mining Functions (Server)
  - PL/SQL & Java APIs
  - Develop & deploy predictive analytics applications
- Wide range of DM algorithms (12)
  - Classification & regression
  - Clustering
  - Anomaly detection
  - Attribute importance
  - Feature extraction (NMF)
  - Association rules (Market Basket analysis)
  - Structured & unstructured data (text mining)
- Oracle Data Miner (GUI)
  - Simplified, guided data mining using wizards
- Predictive Analytics
  - *"1-click data mining"* from a spreadsheet

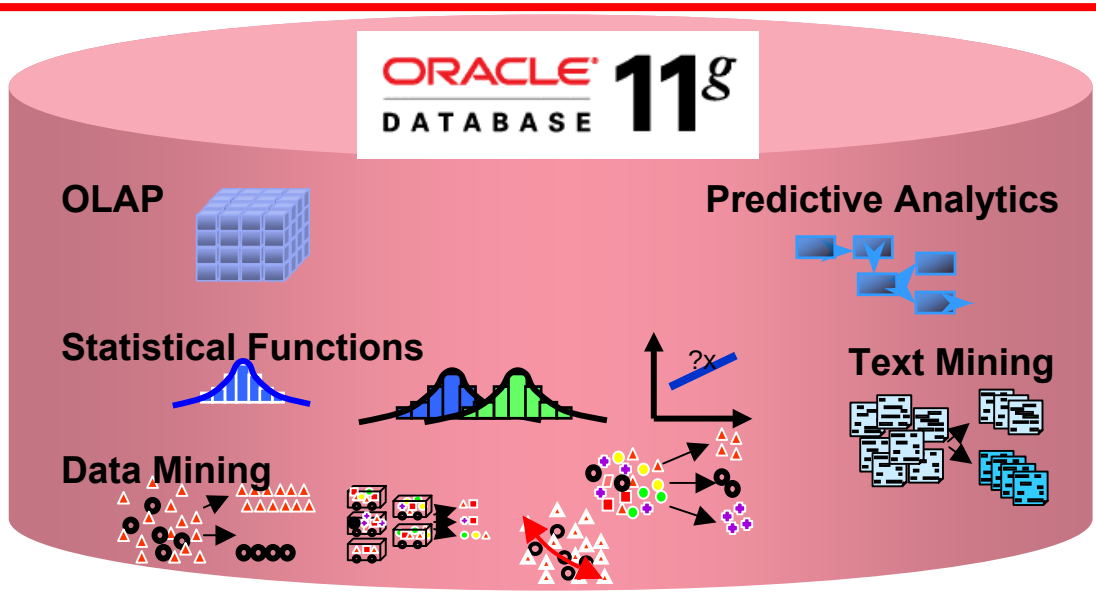




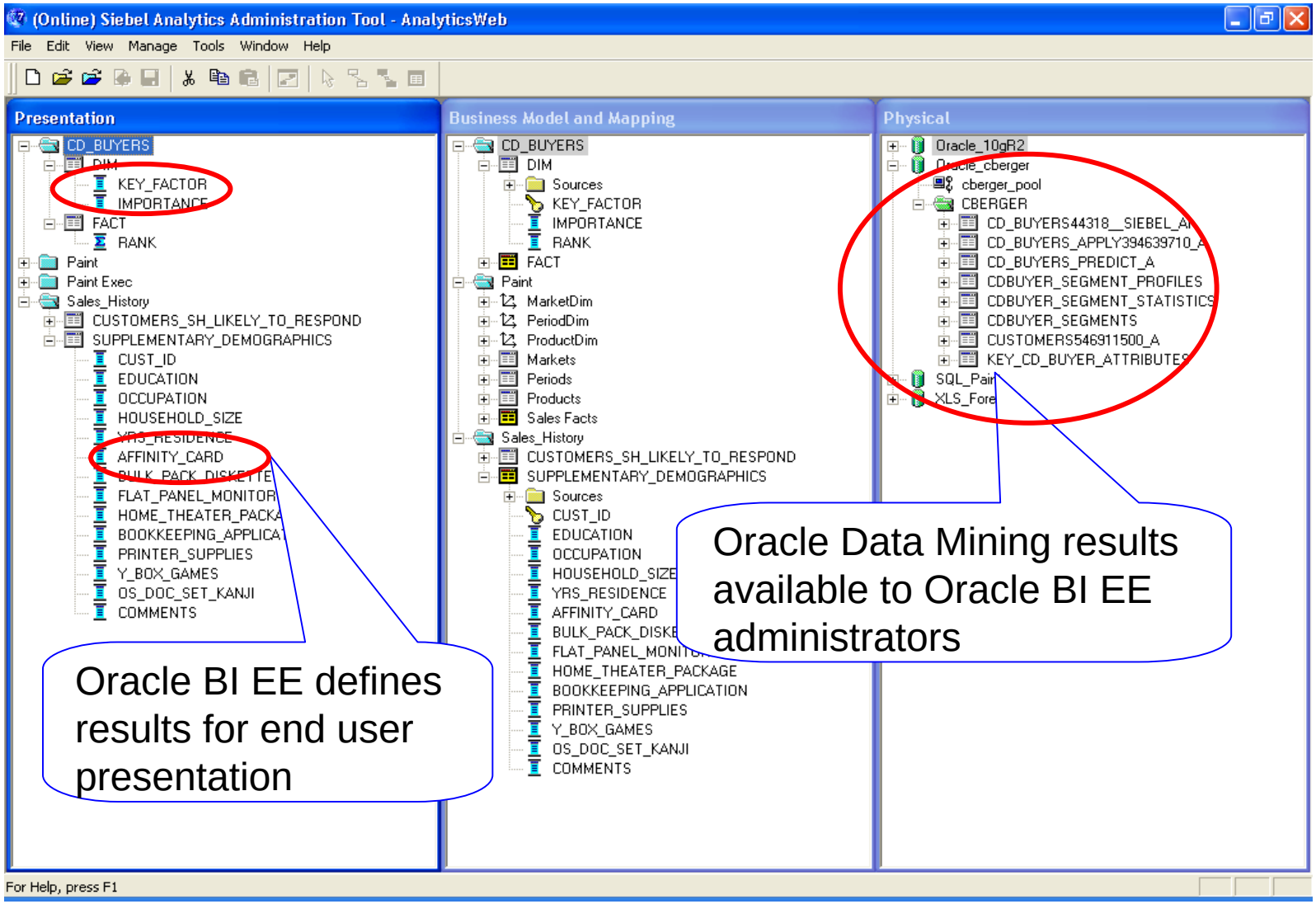
Analytical Database Changes… **Everything**

It boils down to this:

Less data movement = faster analytics, and faster analytics = better BI throughout the enterprise

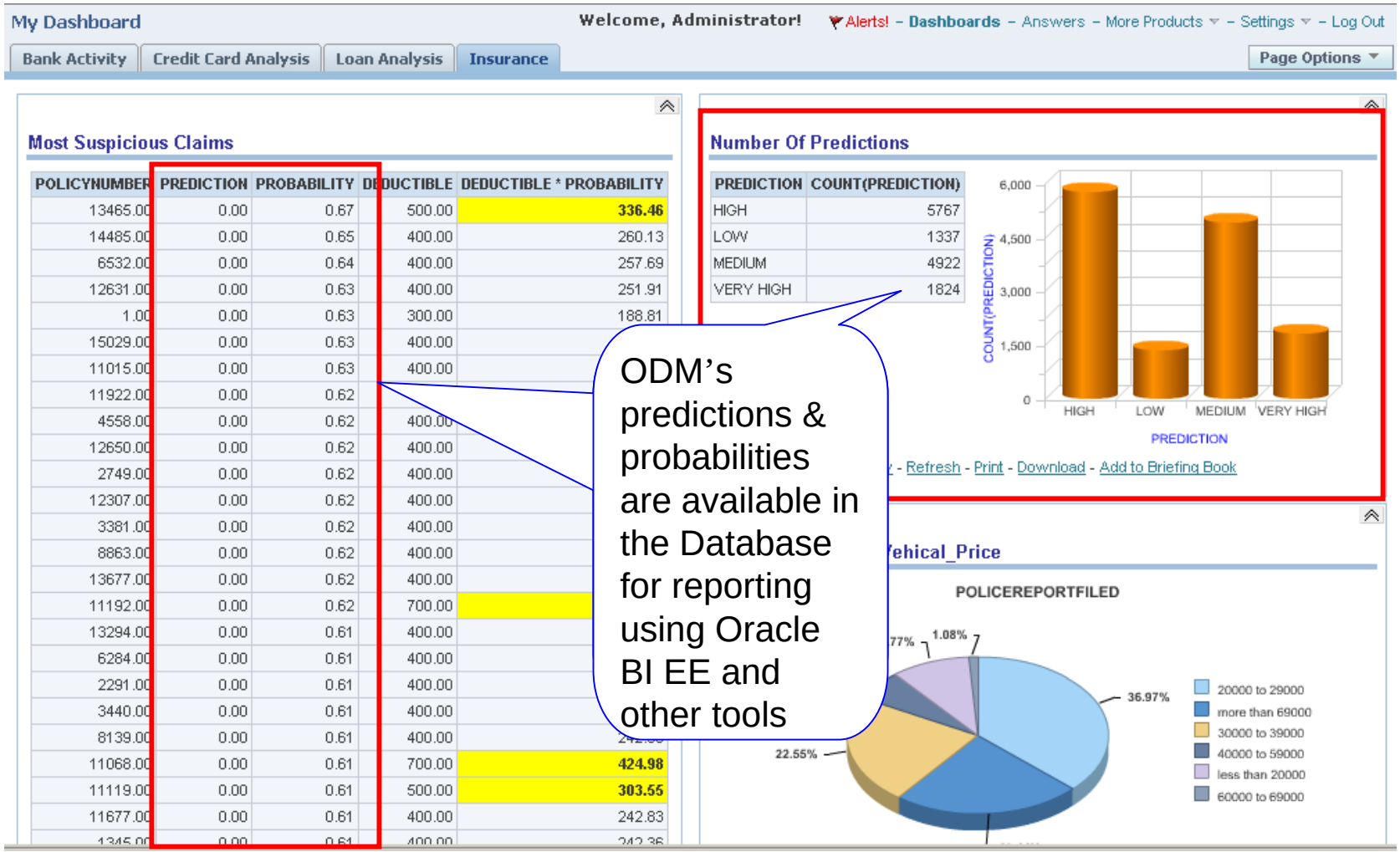


Integration with Oracle BI EE



Example

Better Information for OBI EE Reports and Dashboards



Oracle Data Mining

- Powers Next-Generation Predictive Applications
  - Rapidly Build Applications that Automatically Mine Data
  - Code Once, Run Anywhere
  - Parallel and Distributed Processing
  - Industry Standard SQL and Java APIs
- Industry Leader in In-Database Data Mining
  - Option to the Industry Leading RDBMS—Oracle Database
  - Classification, Regression, Attribute Importance
  - Clustering, Market Basket Analysis, Anomaly Detection, Feature Extraction
  - Cutting Edge Algorithms: SVM, One-Class SVM, NMF, Scalable GLM

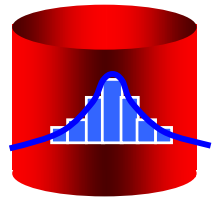
Oracle Data Mining

- More Information from More Data
  - Easy to use Oracle Data Miner Graphical User Interface
  - Wide Range of In-Database Data Mining Algorithms and Statistics
  - Mine Text, Transactional, and Star Schema Data
  - Mine XML, Semantic RDF, Spatial, and OLAP Data
- Eliminate Barriers Between Analysts and IT
  - Quickly Disseminate Analytical Results and Models Throughout the Organization
  - Include Real-Time Predictive Models and New Insights in SQL queries
  - Eliminate Data Movement, Maximize Security

Oracle SQL Statistical Functions
(Free!)

11g Statistics & SQL Analytics

(Oracle Database EE)



- Ranking functions
  - rank, dense_rank, cume_dist, percent_rank, ntile
- Window Aggregate functions (moving and cumulative)
  - Avg, sum, min, max, count, variance, stddev, first_value, last_value
- LAG/LEAD functions
  - Direct inter-row reference using offsets
- Reporting Aggregate functions
  - Sum, avg, min, max, variance, stddev, count, ratio_to_report
- Statistical Aggregates
  - Correlation, linear regression family, covariance
- Linear regression
  - Fitting of an ordinary-least-squares regression line to a set of number pairs.
  - Frequently combined with the COVAR_POP, COVAR_SAMP, and CORR functions.

Note: Statistics and SQL Analytics are included in Oracle Database Standard Edition

- Descriptive Statistics
  - average, standard deviation, variance, min, max, median (via percentile_count), mode, group-by & roll-up
  - DBMS_STAT_FUNCS: summarizes numerical columns of a table and returns count, min, max, range, mean, stats_mode, variance, standard deviation, median, quantile values, +/- n sigma values, top/bottom 5 values
- Correlations
  - Pearson's correlation coefficients, Spearman's and Kendall's (both nonparametric).
- Cross Tabs
  - Enhanced with % statistics: chi squared, phi coefficient, Cramer's V, contingency coefficient, Cohen's kappa
- Hypothesis Testing
  - Student t-test , F-test, Binomial test, Wilcoxon Signed Ranks test, Chi-square, Mann Whitney test, Kolmogorov-Smirnov test, One-way ANOVA
- Distribution Fitting
  - Kolmogorov-Smirnov Test, Anderson-Darling Test, Chi-Squared Test, Normal, Uniform, Weibull, Exponential
- Pareto Analysis (documented)
  - 80:20 rule, cumulative results table

Descriptive Statistics

- MEDIAN & MODE
  - Median: takes numeric or datetype values and returns the middle value
  - Mode: returns the most common value

> SQL

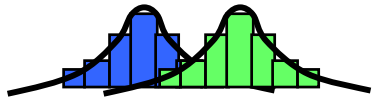
```
A. SELECT STATS_MODE(AGE) from LYMPHOMA;

B. SELECT MEDIAN(AGE) from LYMPHOMA;

C. SELECT TREATMENT_PLAN, STATS_MODE(LYMPH_TYPE)
   from lymphoma GROUP BY TREATMENT_PLAN;

D. SELECT LYMPH_TYPE, MEDIAN(SIZE_REDUCTION) from
   LYMPHOMA GROUP BY LYMPH_TYPE ORDER BY
   MEDIAN(SIZE_REDUCTION) ASC;
```

Independent Samples T-Test
(Pooled Variances)

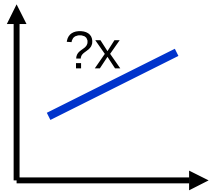


- Query compares the mean of AMOUNT_SOLD between MEN and WOMEN within CUST_INCOME_LEVEL ranges

```
SELECT substr(cust_income_level,1,22) income_level,
  avg(decode(cust_gender,'M',amount_sold,null)) sold_to_men,
  avg(decode(cust_gender,'F',amount_sold,null)) sold_to_women,
  stats_t_test_indep(cust_gender, amount_sold, 'STATISTIC','F')
  t_observed,
  stats_t_test_indep(cust_gender, amount_sold) two_sided_p_value
FROM sh.customers c, sh.sales s
WHERE c.cust_id=s.cust_id
GROUP BY rollup(cust_income_level)
  ORDER BY 1;
```

SQL Worksheet

Correlation Functions



- The CORR_S and CORR_K functions support nonparametric or rank correlation (finding correlations between expressions that are ordinal scaled).
- Correlation coefficients take on a value ranging from –1 to 1, where:
  - 1 indicates a perfect relationship
  - –1 indicates a perfect inverse relationship
  - 0 indicates no relationship
- The following query determines whether there is a correlation between the AGE and WEIGHT of people, using Spearman's correlation:

```
select CORR_S(AGE, WEIGHT)
    coefficient,
    CORR_S(AGE, WEIGHT,
    'TWO_SIDED_SIG')
    p_value,
substr(TREATMENT_PLAN, 1,15)
as TREATMENT_PLAN
from CBERGER.LYMPHOMA
GROUP BY TREATMENT_PLAN;
```

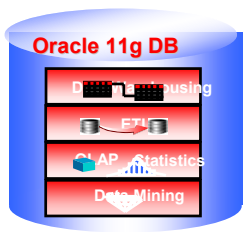
COEFFICIENT	P_VALUE	TREATMENT_PLAN
.1862586290028...	.019908367365...	Chemo&Radiation
-.0575579915035...	.072279268481...	Chemo_only
-.0746488538574...	.288631463930...	Experimental
-.1254971583227...	.000018140526...	Radiation

ORACLE Analytics vs. SAS

1. **In-Database** Analytics Engine
   - Basic Statistics *(Free)*
   - Data Mining
   - Text Mining

2. Costs (ODM: **$23K cpu**)
   - Simplified environment
   - Single server
   - Security

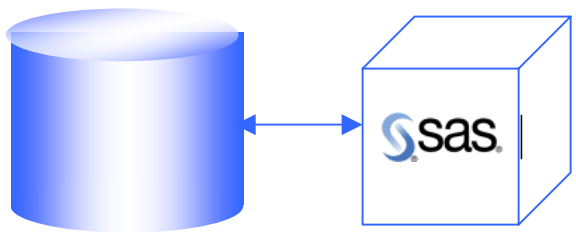
3. IT Platform
   - SQL (standard)
   - Java (standard)



1. ***External*** Analytical Engine
   - Basic Statistics
   - Data Mining
   - Text Mining (separate: SAS EM for Text)
   - *Advanced* Statistics

2. Costs (SAS EM: **$150K/5 users**)
   - Duplicates data
   - Annual Renewal Fee (AUF)
     (~45% each year)

3. IT Platform
   - SAS Code (proprietary)



ORACLE Analytics vs. SAS

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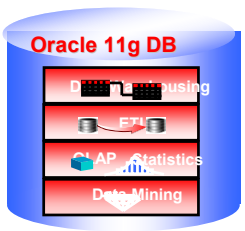

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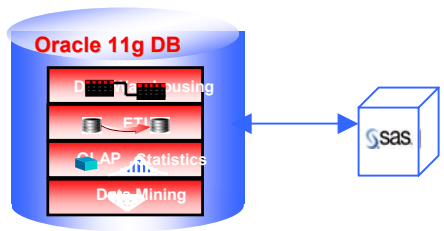
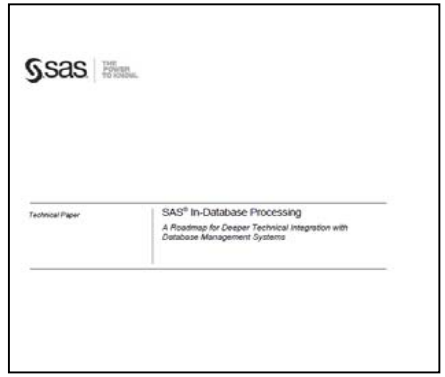


SAS In-Database Processing

3-Year Road Map

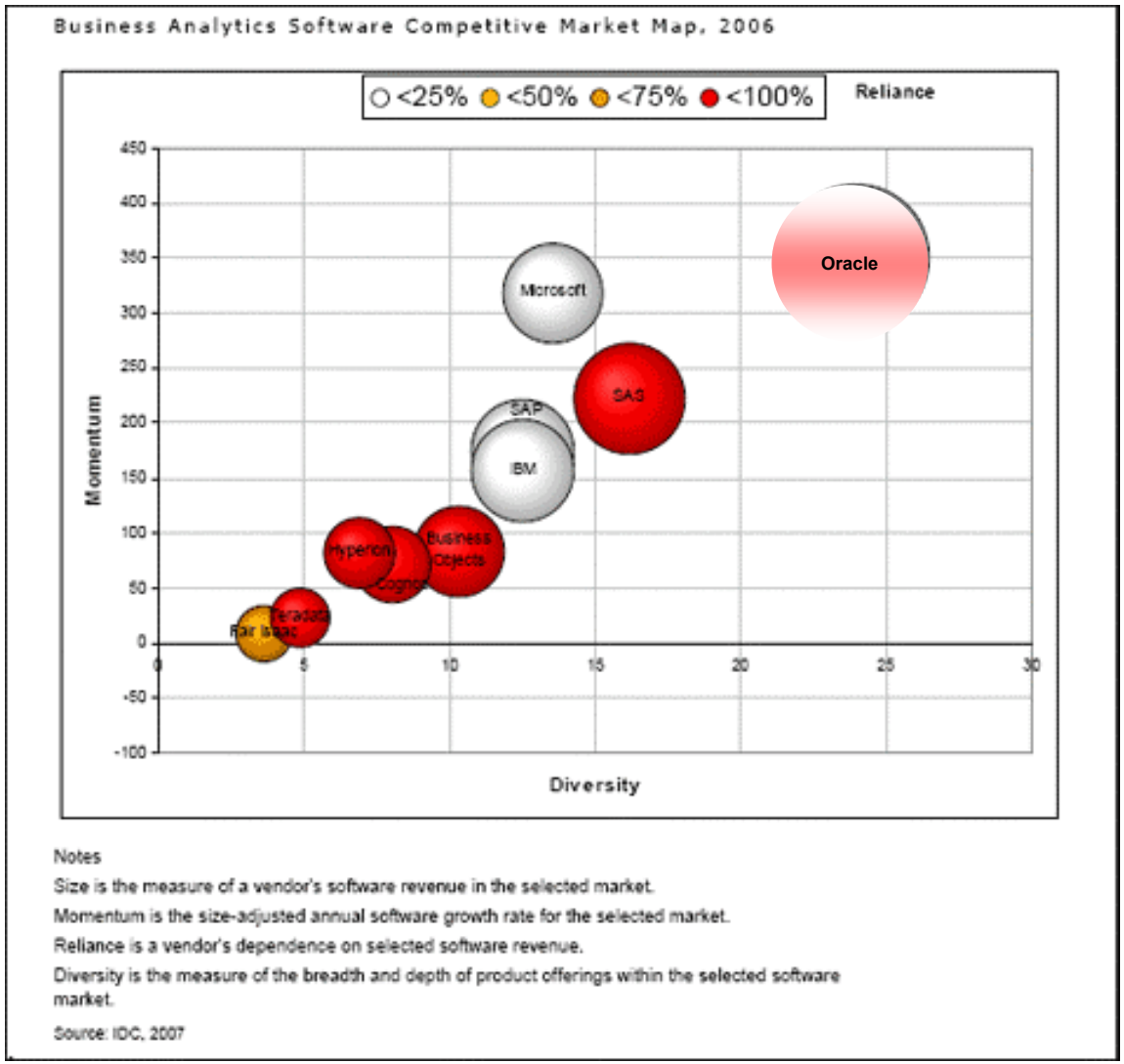


- "The goal of the SAS In-Database initiative is … to achieve deeper technical integration with database providers..
- …, the SAS engine often must load and extract data over a network to and from the DBMS. This presents a series of challenges:
- …Network bottlenecks between SAS and the DBMS constrain access to large volumes of data
- … the results of the SAS processing must be transferred back to the DBMS for final storage, which further increases the cost.

Source: SAS In-Database Processing *White Paper—October 2007*

ORACLE

IDC Worldwide Business Analytics Software



Notes

Size is the measure of a vendor's software revenue in the selected market.

Momentum is the size-adjusted annual software growth rate for the selected market.

Reliance is a vendor's dependence on selected software revenue.

Diversity is the measure of the breadth and depth of product offerings within the selected software market.

Source: IDC, 2007

http://www.oracle.com/corporate/analyst/reports/infrastructure/bi_dw/208699e.pdf

Brief Demonstrations

1. Oracle Data Mining
2. OOW Schedule Builder
3. CRM Sales Prospector
4. HCM Application

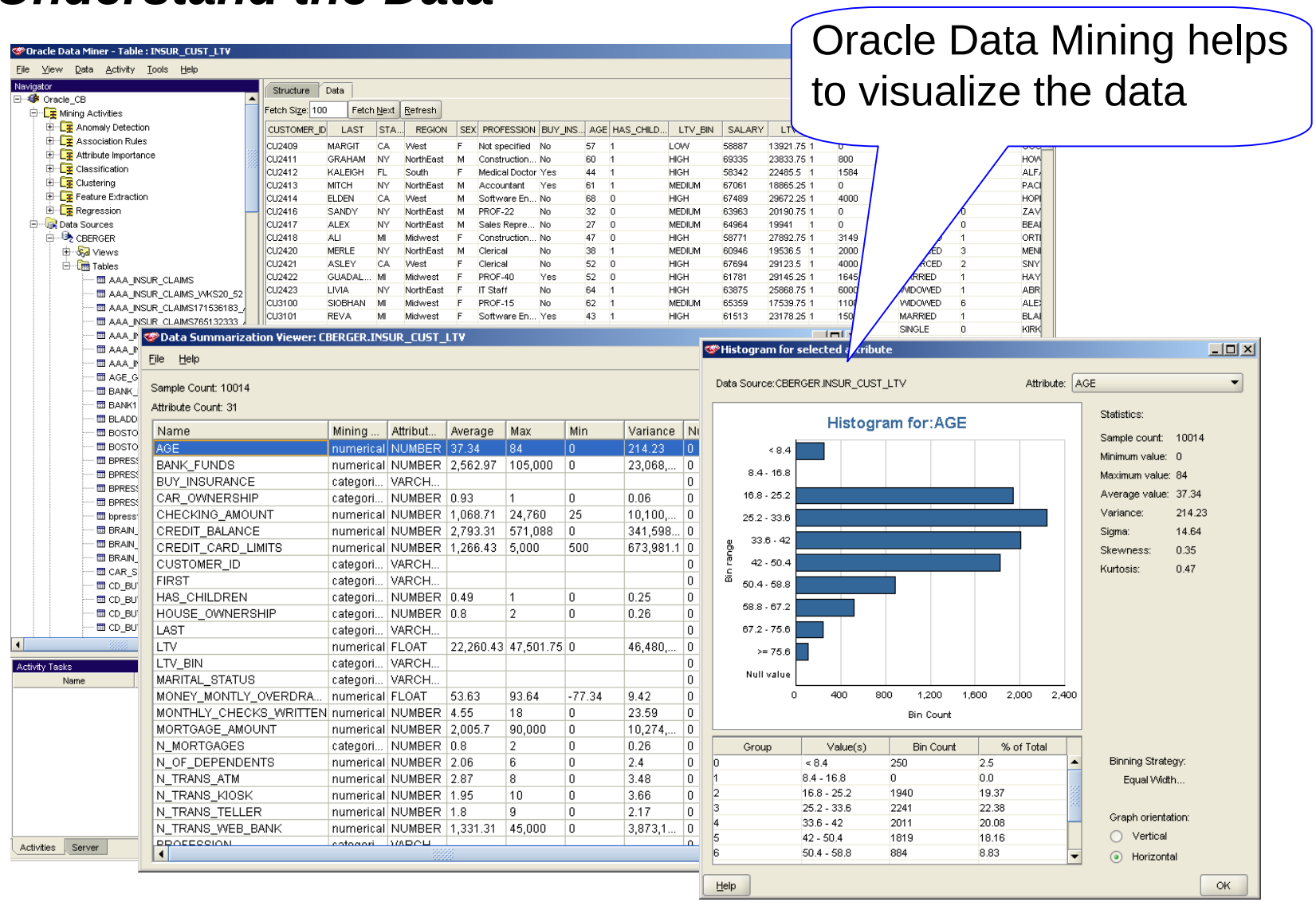
Oracle Data Mining + OBI EE

Quick Demo: Oracle Data Mining

- Scenario: Insurance Company
- Business problem(s):
  1. Better understand the business by looking at graphs of the data
  2. Identify the factors (attributes) most associated with Customer who BUY_INSURANCE
  3. Target Best Customers
     a. Build a predictive model to understand who will be a VERY_HIGH VALUE Customer …. And WHY (IF… THEN.. Rules that can describe them)
     b. Predict who is likely to be a VERY_HIGH VALUE Customer in the future
     c. View results in an OBI EE Dashboard
        - Including other business problems e.g. Fraud, Cross-Sell, etc.
        - (Entire process **can be automated** w/ PL/SQL and/or Java APIs)

Oracle Data Mining + OBI EE

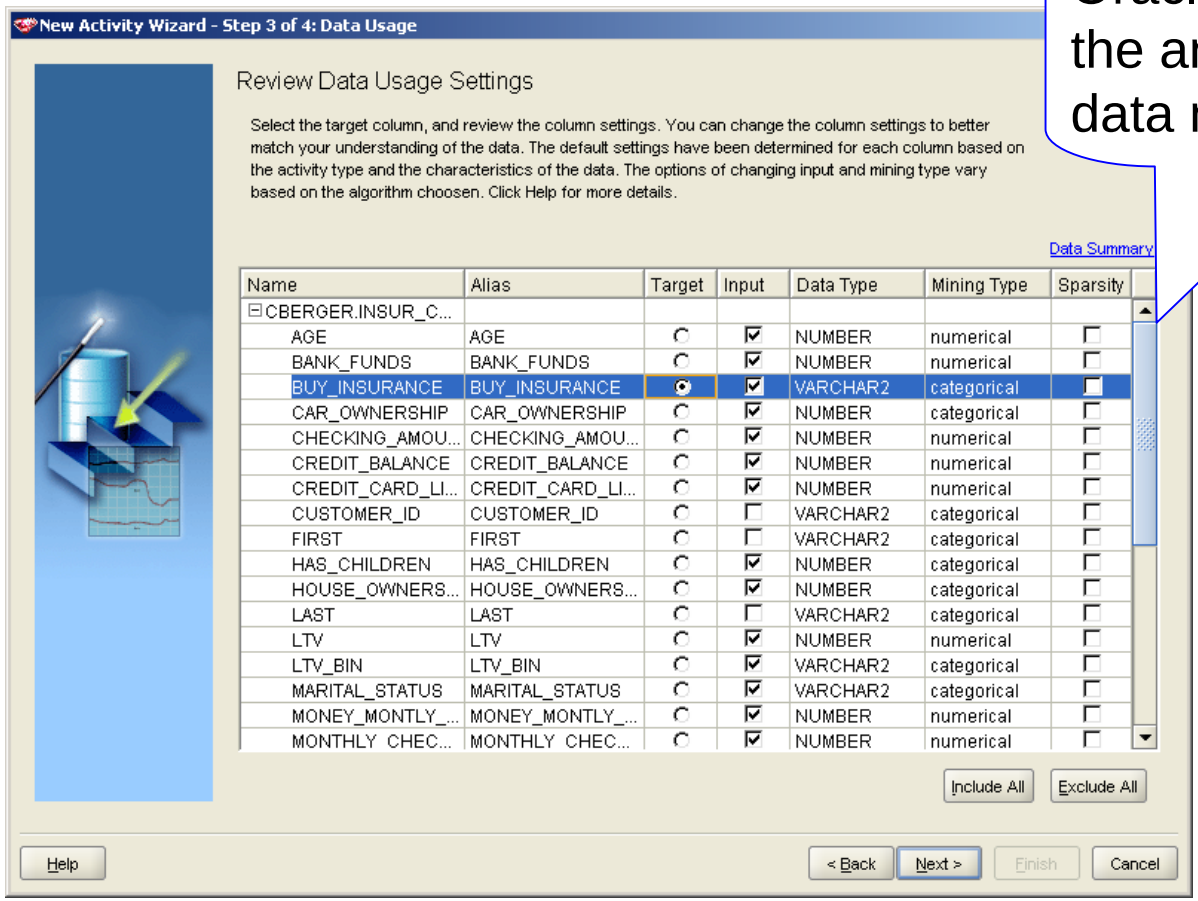
Understand the Data



Oracle Data Mining + OBI EE

Target the Right Customers

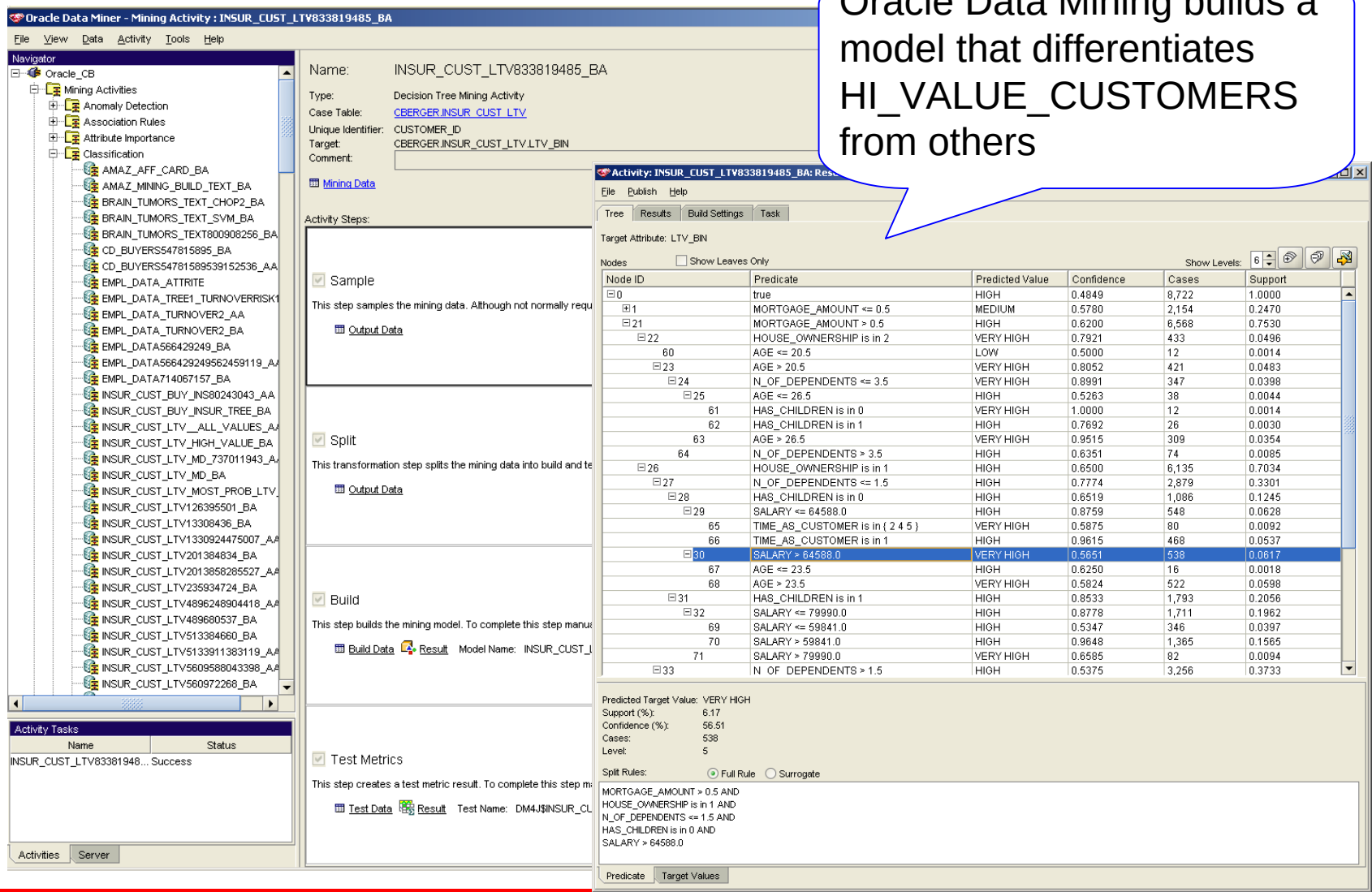
Oracle Data Miner guides the analyst through the data mining process



Oracle Data Mining + OBI EE

Targeting High Value Customers

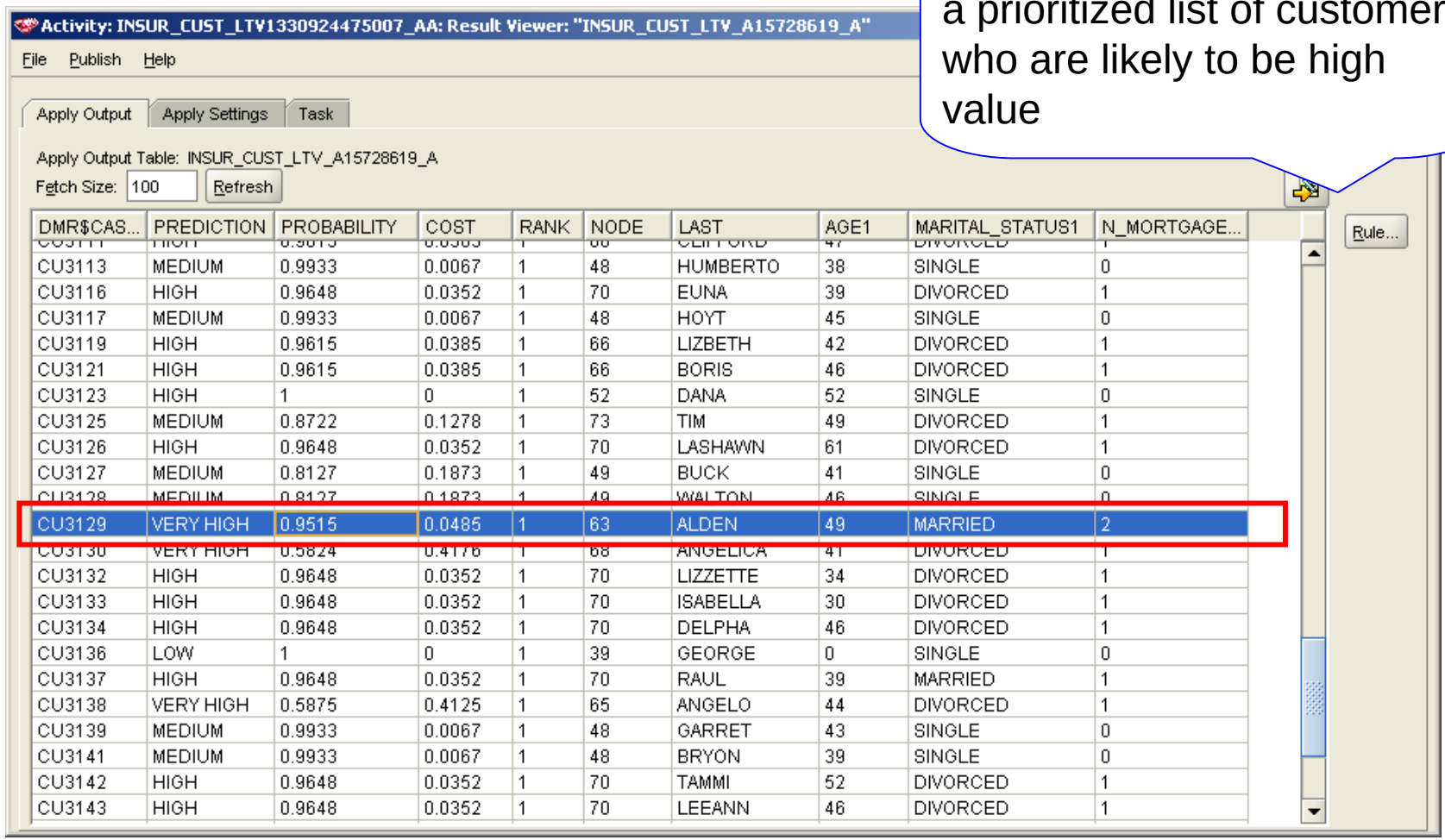
Oracle Data Mining builds a model that differentiates HI_VALUE_CUSTOMERS from others



Oracle Data Mining + OBI EE

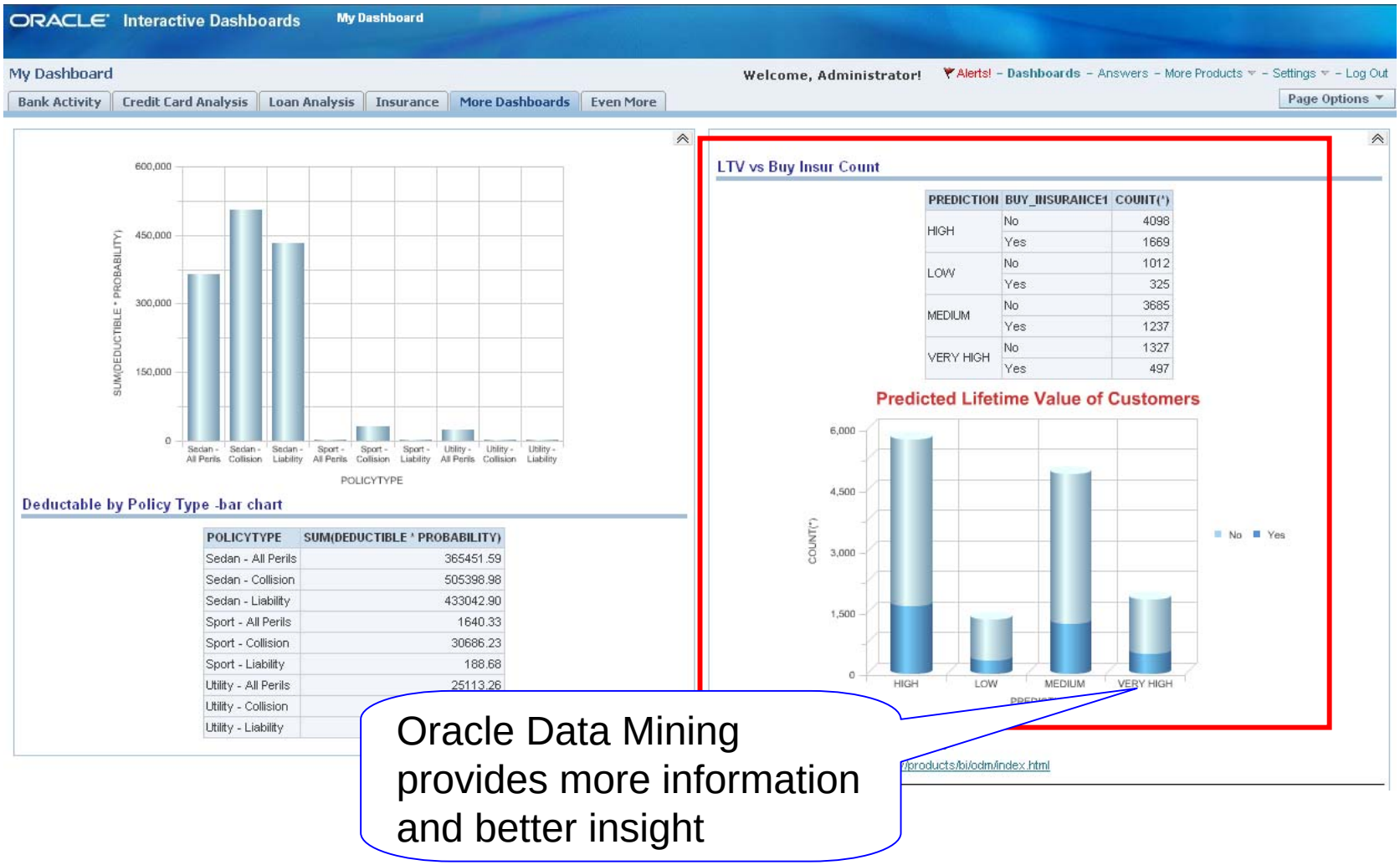
Targeting High Value Customers

Oracle Data Mining creates a prioritized list of customer who are likely to be high value



DMR$CAS...	PREDICTION	PROBABILITY	COST	RANK	NODE	LAST	AGE1	MARITAL_STATUS1	N_MORTGAGE...
CU3113	MEDIUM	0.9933	0.0067	1	48	HUMBERTO	38	SINGLE	0
CU3116	HIGH	0.9648	0.0352	1	70	EUNA	39	DIVORCED	1
CU3117	MEDIUM	0.9933	0.0067	1	48	HOYT	45	SINGLE	0
CU3119	HIGH	0.9615	0.0385	1	66	LIZBETH	42	DIVORCED	1
CU3121	HIGH	0.9615	0.0385	1	66	BORIS	46	DIVORCED	1
CU3123	HIGH	1	0	1	52	DANA	52	SINGLE	0
CU3125	MEDIUM	0.8722	0.1278	1	73	TIM	49	DIVORCED	1
CU3126	HIGH	0.9648	0.0352	1	70	LASHAWN	61	DIVORCED	1
CU3127	MEDIUM	0.8127	0.1873	1	49	BUCK	41	SINGLE	0
CU3129	VERY HIGH	0.9515	0.0485	1	63	ALDEN	49	MARRIED	2
CU3132	HIGH	0.9648	0.0352	1	70	LIZZETTE	34	DIVORCED	1
CU3133	HIGH	0.9648	0.0352	1	70	ISABELLA	30	DIVORCED	1
CU3134	HIGH	0.9648	0.0352	1	70	DELPHA	46	DIVORCED	1
CU3136	LOW	1	0	1	39	GEORGE	0	SINGLE	0
CU3137	HIGH	0.9648	0.0352	1	70	RAUL	39	MARRIED	1
CU3138	VERY HIGH	0.5875	0.4125	1	65	ANGELO	44	DIVORCED	1
CU3139	MEDIUM	0.9933	0.0067	1	48	GARRET	43	SINGLE	0
CU3141	MEDIUM	0.9933	0.0067	1	48	BRYON	39	SINGLE	0
CU3142	HIGH	0.9648	0.0352	1	70	TAMMI	52	DIVORCED	1
CU3143	HIGH	0.9648	0.0352	1	70	LEEANN	46	DIVORCED	1

Integration with Oracle BI EE



Oracle Data Mining provides more information and better insight

Oracle Data Mining

Know More, Do More, Spend Less

Business Decision Makers	Data Analysts	Integrators and IT
• Make Better Decisions • Extract More Value from Your Data • Lower Your Total Cost of Ownership	• Get Results Faster • Get More Results • Easy to Use	• Create More Value for Your Organization • Make Your Work Easier • Transform IT from a Cost to a Profit Center

Predictive Analytics Use Case

- The cast:
  - Peter: a data mining analyst
  - Sally: a marketing manager
- Peter builds a decision tree classification model, tree_model
- Peter grants the ability to view/score the tree model to Sally

```
GRANT SELECT MODEL ON tree_model TO Sally;
```

- Sally inspects the model, likes it, and wants it deployed
- Sally scores the customer database using the new model and his understanding of the cost of contacting a customer and sends the new contact list to the head of the sales department

```
CREATE TABLE AS SELECT cust_name, cust_phone FROM
customers
WHERE prediction(Peter.tree_model cost matrix (0,5,1,0) using *) =
‘responder’;
```

Real-time Prediction

```
with
  records as (select
    78000   SALARY,
    250000    MORTGAGE_AMOUNT,
    6    TIME_AS_CUSTOMER,
    12    MONTHLY_CHECKS_WRITTEN,
    55    AGE,
    423  BANK_FUNDS,
    'Married'    MARITAL_STATUS,
    'Nurse'    PROFESSION,
    'M'    SEX,
    4000    CREDIT_CARD_LIMITS,
    2    N_OF_DEPENDENTS,
    1    HOUSE_OWNERSHIP  from dual)
  select s.prediction prediction, s.probability probability
  from (
    select PREDICTION_SET(INSUR_CUST_LT68054_DT, 1  USING *) pset
    from records) t, TABLE(t.pset) s;
```

On-the-fly, single record apply with new data (e.g. from call center)

PREDICTION	PROBABILITY
HIGH	.65123504738232096

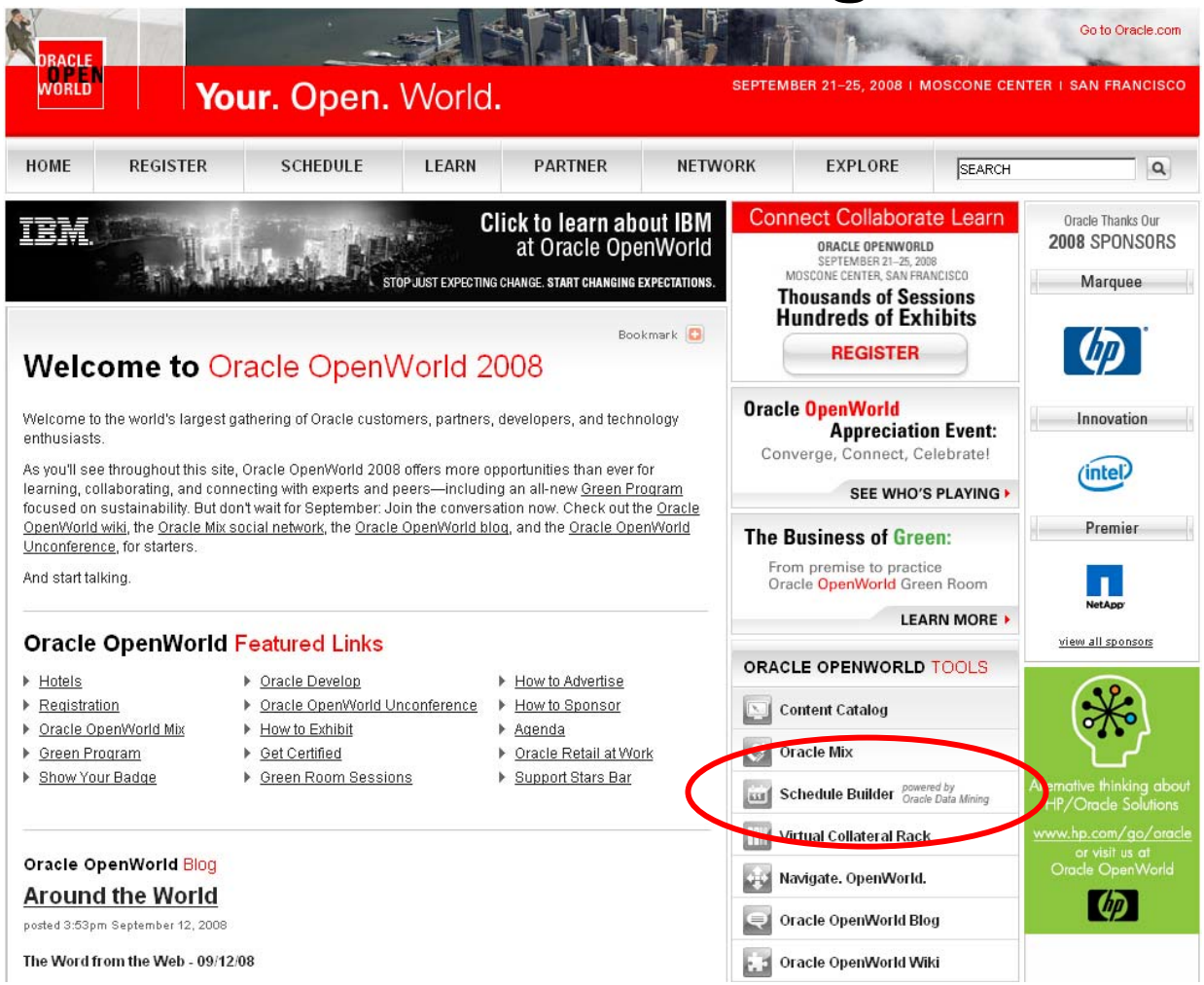
Real-time Prediction Multiple Models

```
with records as (select
   178255 ANNUAL_INCOME,
      0 CAPITAL_GAIN,
      83 SAVINGS_BALANCE,
      246 AVE_CHECKING_BALANCE,
   30 AGE,
      'Bach.' EDUCATION,
      'SelfENI' WORKCLASS,
      'Married' MARITAL_STATUS,
      'Sales' OCCUPATION,
      'Husband' RELATIONSHIP,
      'White' RACE,
      'Male' SEX,
      70 HOURS_PER_WEEK,
      '?' NATIVE_COUNTRY,
      98 PAYROLL_DEDUCTION from dual)
   select t.*
   from (
     select 'CAR_MODEL' MODEL, s1.prediction prediction, s1.probability probability, s1.probability*25000 as expected_revenue from (
       select PREDICTION_SET(NBMODEL_JDM, 1  USING *) pset
       from records ) t1, TABLE(t1.pset) s1
     UNION
     select 'MOTOCYCLE_MODEL' MODEL, s2.prediction prediction, s2.probability probability, s1.probability*2000 as expected_revenue
from (
       select PREDICTION_SET(ABNMODEL_JDM, 1  USING *) pset
       from records ) t2, TABLE(t2.pset) s2
     UNION
     select 'TRICYCLE_MODEL' MODEL, s3.prediction prediction, s3.probability probability, s1.probability*50 as expected_revenue from (
       select PREDICTION_SET(TREEMODEL_JDM, 1  USING *) pset
       from records ) t3, TABLE(t3.pset) s3
     UNION
     select 'BICYCLE_MODEL' MODEL, s4.prediction prediction, s4.probability probability, s1.probability*200 as expected_revenue from (
       select PREDICTION_SET(SVMCMODEL_JDM, 1  USING *) pset
       from records ) t4, TABLE(t4.pset) s4
     )  t
     order by t.expected_revenue desc;
```

On-the-fly, single record apply with multiple models; sort by expected revenues

OOW Schedule Builder

OOW 2008 Schedule Builder Recommendation Engine



OOW 2008 Schedule Builder Recommendation Engine

Schedule Builder Login

To create a personal schedule, please login using your Username and Password you created during your registration. If you have forgotten your password, please click here.

*Username: Charlie_Finance

*Password: ••••••••

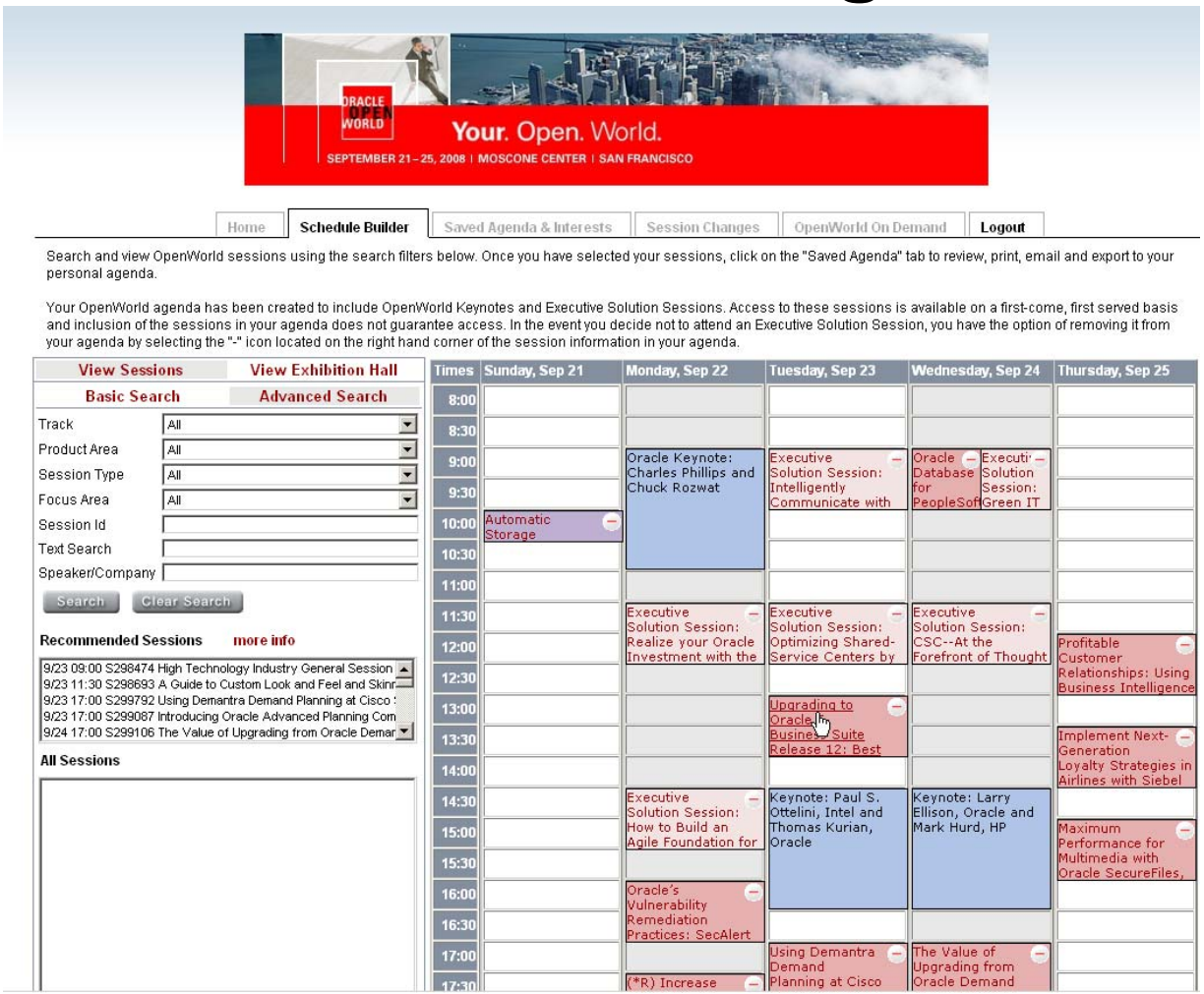
Submit

Additional Assistance:
If you are experiencing difficulties logging in or have questions, please call the Oracle OpenWorld Registration Team at 1.866.382.7147 (U.S. and Canada) or +1.650.226.0812 (International) or email OpenWorldReg@eventreg.com.

GlobalLINKS® Event Management Portal

GEORGE P JOHNSON experience marketing

OOW 2008 Schedule Builder Recommendation Engine



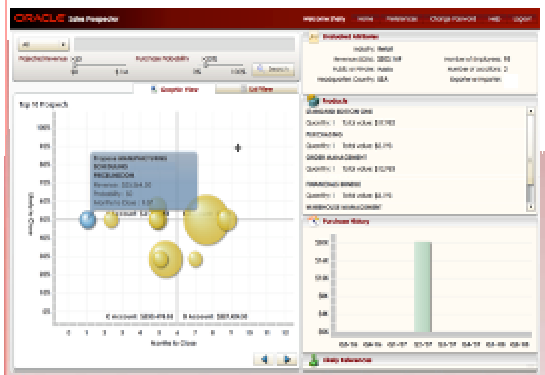
Oracle Sales Prospector

John Kim
Director, Product Mgmt

Oracle Social CRM

Social Sales Applications

Sales Prospector

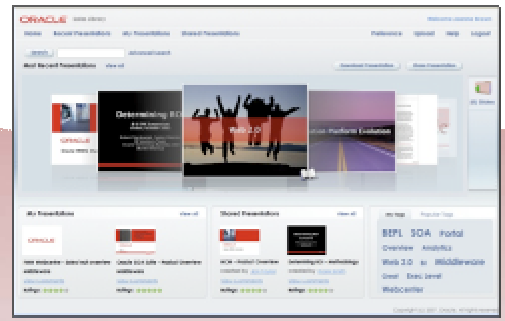


Insight on what to sell next based on analysis of buying patterns of customers with similar attributes

Sales Campaigns

Create sophisticated html campaigns in email, share and track the results of their campaigns

Sales Library



Shared library to facilitate finding and sharing of sales content; PowerPoint, Word, Excel, PDF etc

Shipped
Available Now

Social CRM

Relationships are Fundamentally Social

Sales 'Forced' Automation

Forecasts for Managers

Sales 1.0

'Stick' Based Model

Transactional

Individual

Report More
Sell Less

Report Less
Sell More

Social

Collaborative

'Carrot' Based Model

Sales 2.0

Sales for Sales Reps

Sales Productivity Applications

How Can I Sell More?

Oracle Sales Prospector

Predictions

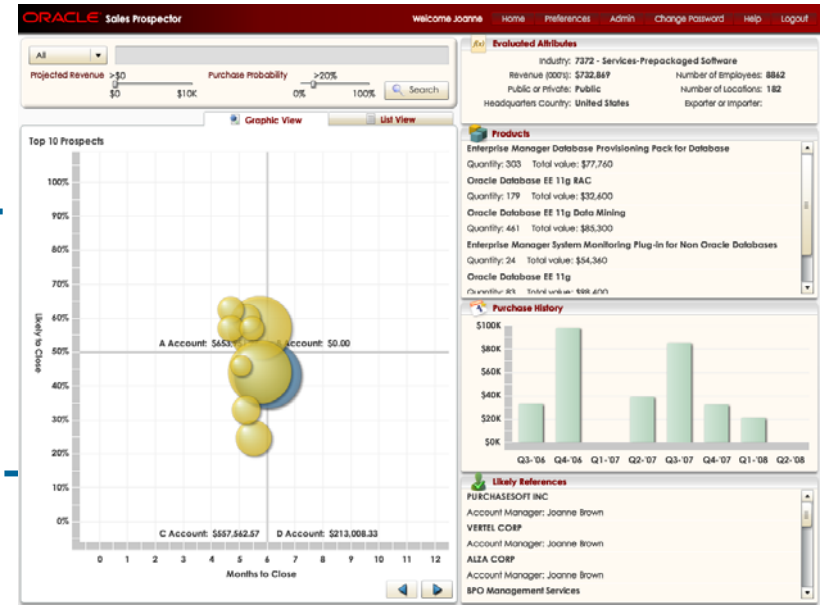
- Revenue
- Probability
- Time to close

Analysis

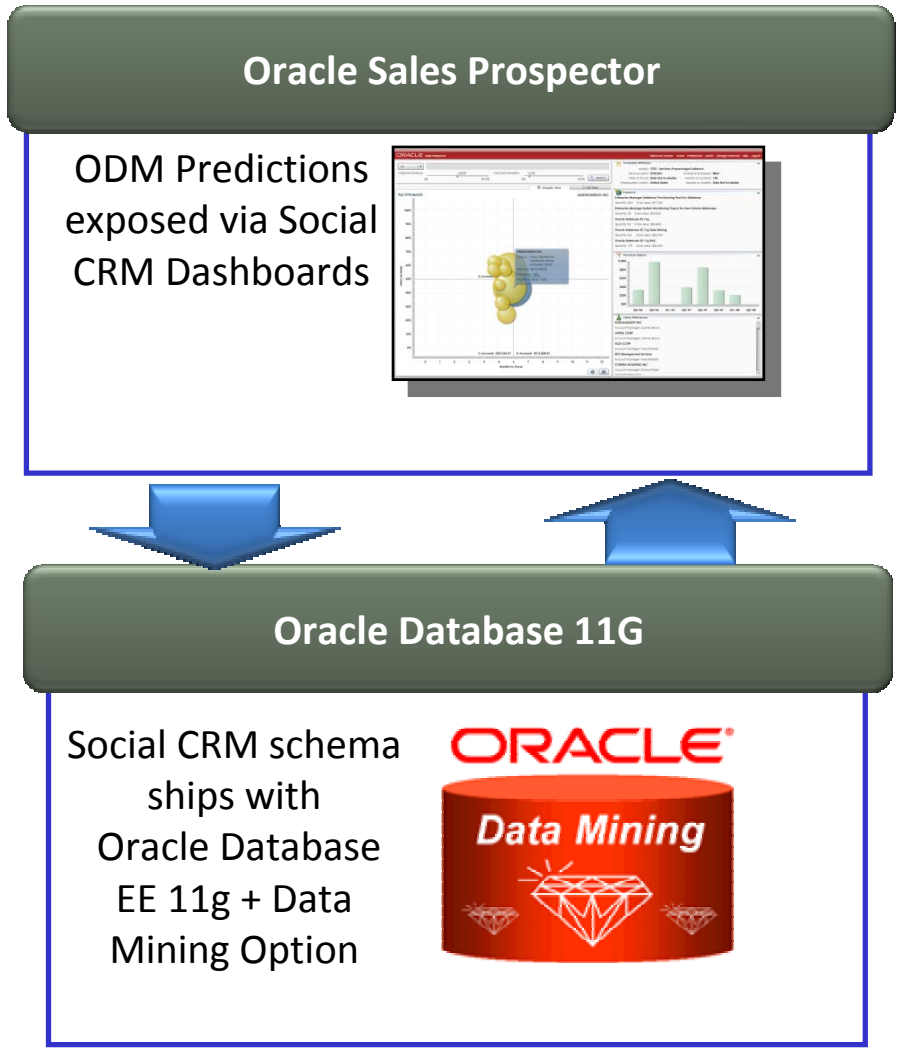
- Customer attributes
- Products owned
- Purchase history

References

- Similar customers
- Similar products

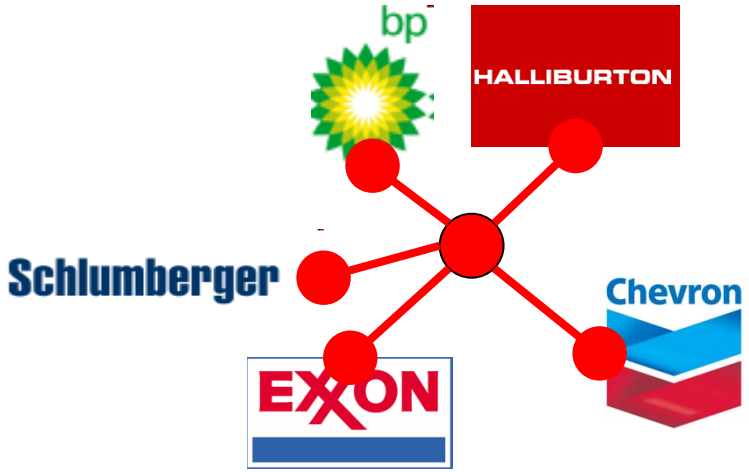


Oracle Data Mining = the Science of Selling



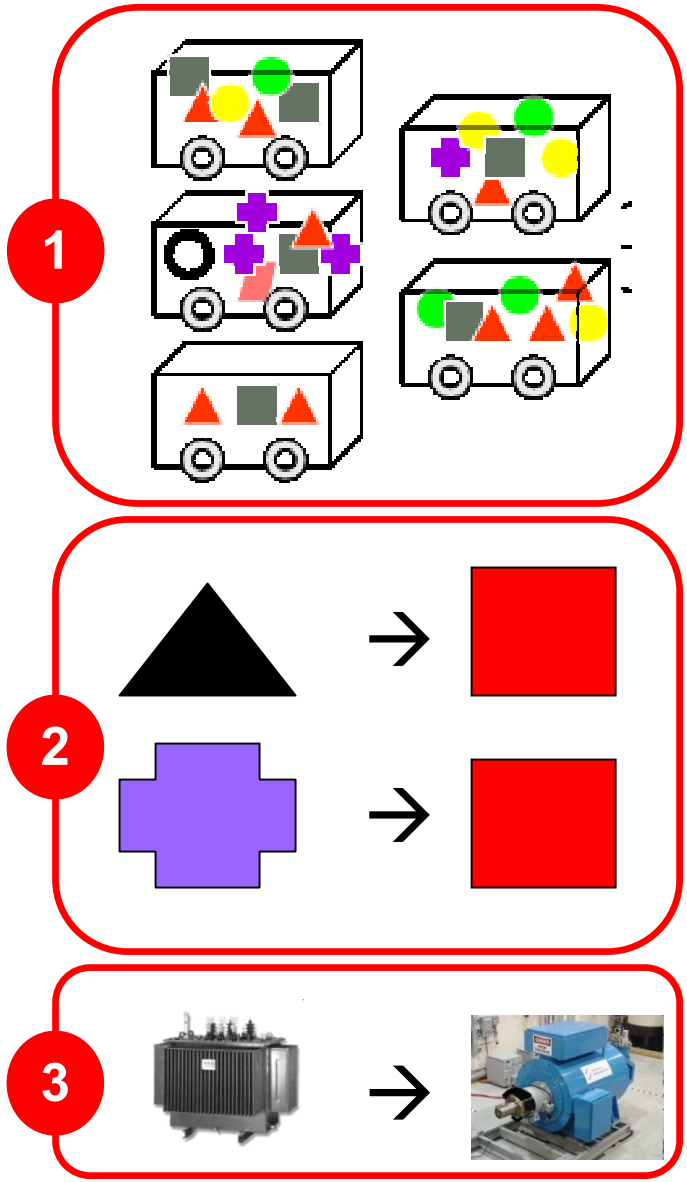
Grouping for Social Comparison

- Each customer belongs to a specific group
- Based on a combination of
  - Demographic Attributes
  - Purchasing Patterns
- Used to
  - Predict revenue
  - Predict time to close
  - Provide references



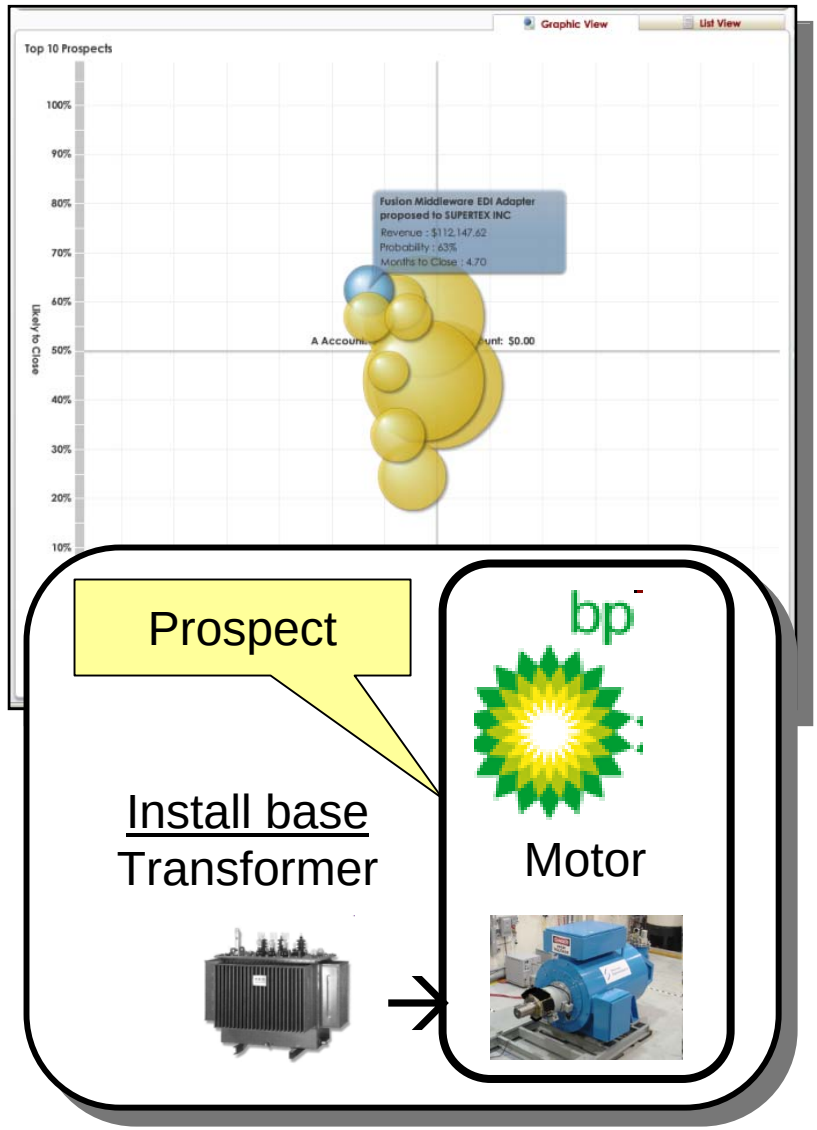
Whitespace → Next Likely Purchase

- Finds co-occurrences between items in a collection
- Based on a combination of
  - Demographic Attributes
  - Purchasing Patterns
- White Space - Used to predict product probability



Prospect Predictions

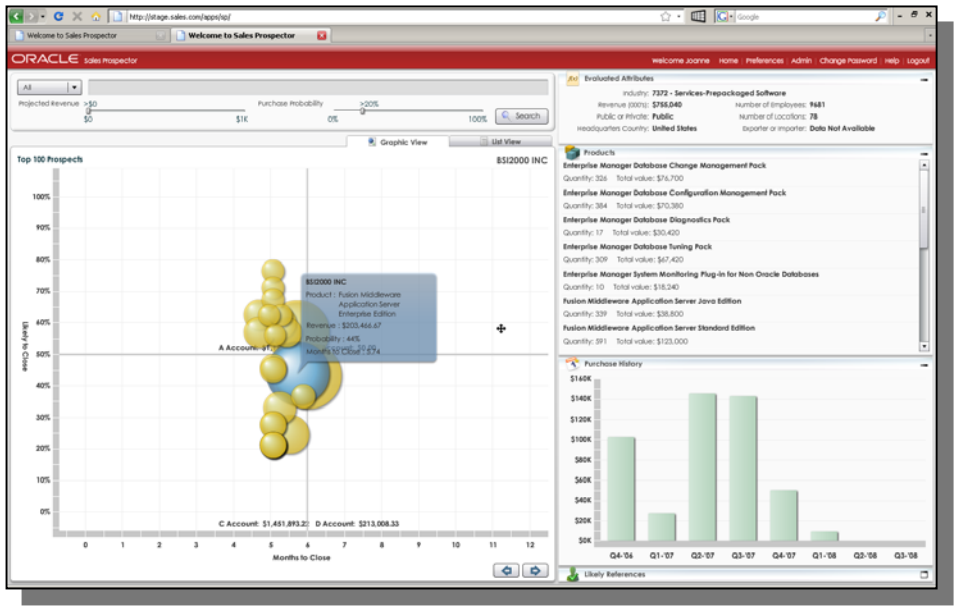
- A Prospect is a combination of a customer and a product
- Data Mining predicts which products each customer is likely to purchase based on the models



Demo – Oracle Sales Prospector

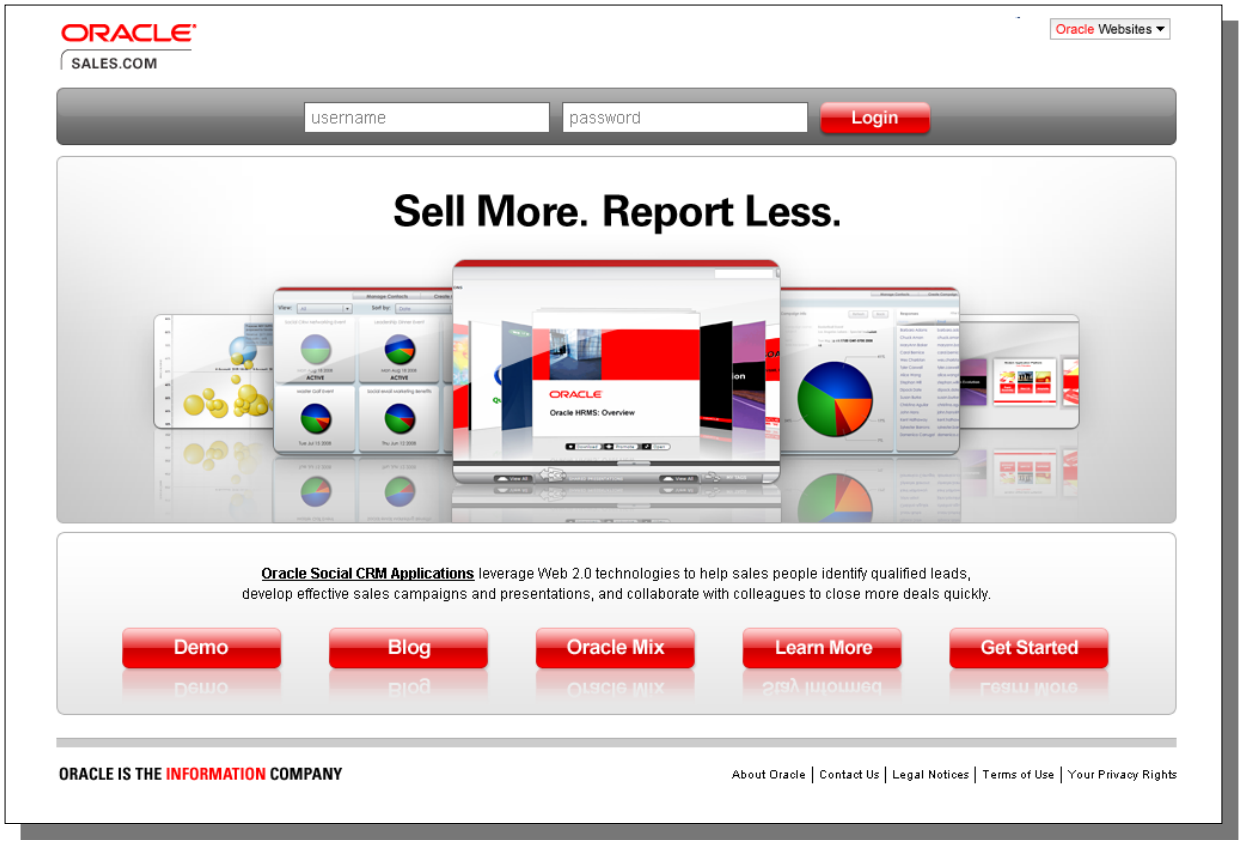
www.sales.com

A Quick Re-cap…



Fish Finder - finds you fish Oracle Sales Prospector - finds you deals

Thank You!



- Head on over to www.sales.com for how Oracle Data Mining powers Oracle Sales Prospector on the Science of Selling
- Come see us - the Demo Booth D10

HCM Applications Predictive Analytics

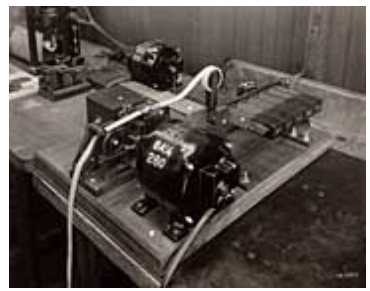
Brian Gaspar
HCM Product Strategy

Historical Perspective

The Hawthorne Project (1924-1933)

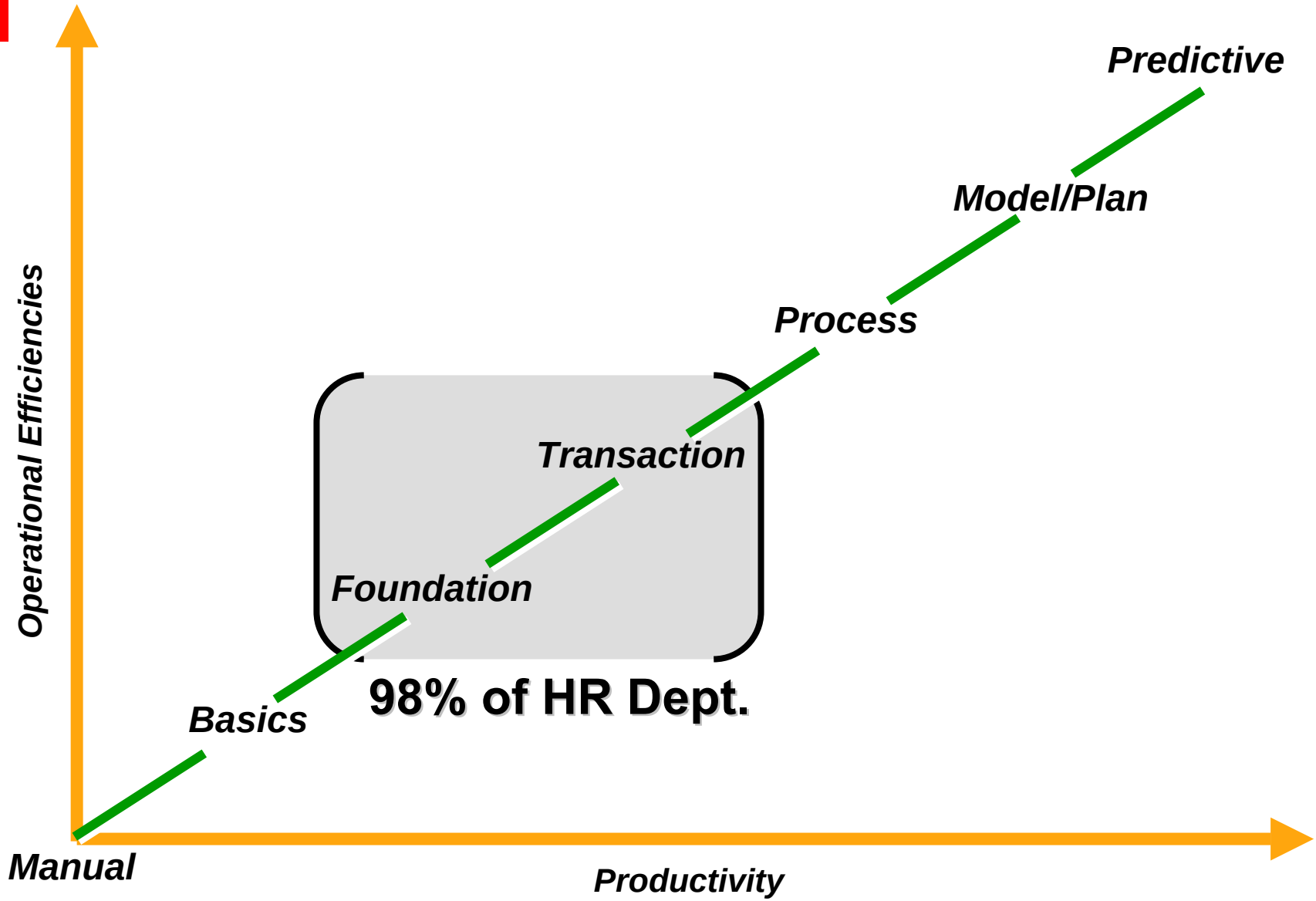
"Any company controlling many thousand workers … tends … to lack any satisfactory criterion of the actual value of its methods of dealing with people."

—Elton Mayo, Harvard Business School, 1933

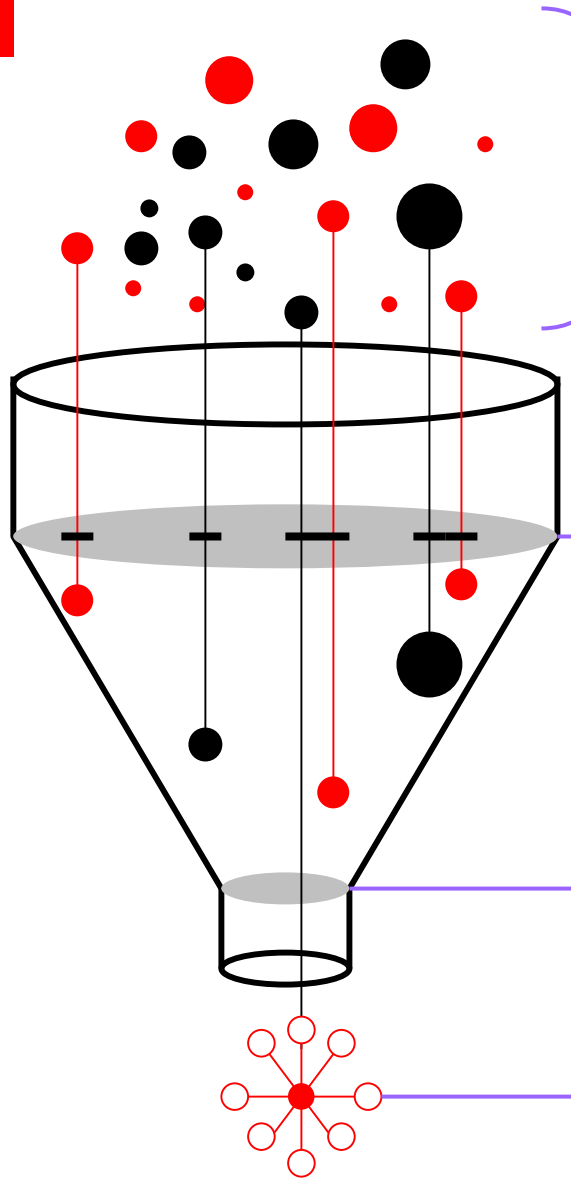


Hawthorne Effect: has been described as the reward you reap when you pay attention to people. The mere act of showing people that you're concerned about them usually spurs them to better job performance.

HCM Product Capabilities



HCM Predictive Analytics



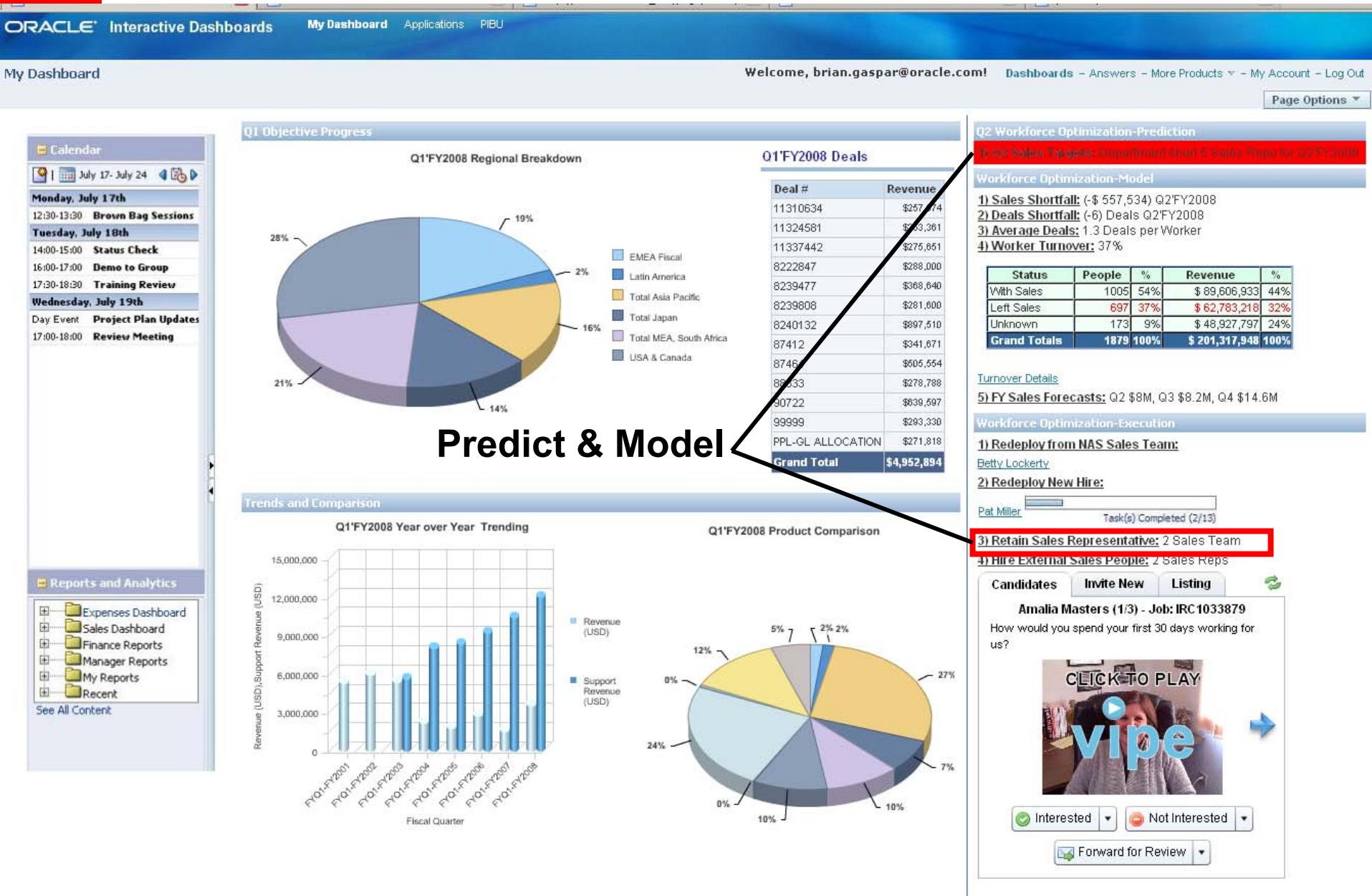
Collection of Internal & External Indicators

Analysis of Change Against Established Baseline Line

Identification of Critical Indicators Exceeding Established Thresholds

Alerted to Workforce Prediction

Demo


ORACLE Interactive Dashboards
My Dashboard
Applications
PIBU
My Dashboard
Welcome, brian.gaspar@oracle.com!
Dashboards – Answers – More Products – My Account – Log Out
Page Options
Calendar
July 17- July 24
Monday, July 17th
12:30-13:30 Brown Bag Sessions
Tuesday, July 18th
14:00-15:00 Status Check
16:00-17:00 Demo to Group
17:30-18:30 Training Review
Wednesday, July 19th
Day Event Project Plan Updates
17:00-18:00 Review Meeting
Reports and Analytics
Expenses Dashboard
Sales Dashboard
Finance Reports
Manager Reports
My Reports
Recent
See All Content
Q1 Objective Progress
Q1'FY2008 Regional Breakdown
19%
2%
16%
14%
21%
28%
EMEA Fiscal
Latin America
Total Asia Pacific
Total Japan
Total MEA, South Africa
USA & Canada
Q1'FY2008 Deals
Deal #
Revenue
11310634
11324581
11337442
8222847
8239477
8239808
8240132
87412
8746
88033
90722
99999
PPL-GL ALLOCATION
$271,818
Grand Total
$4,952,894
Predict & Model
Trends and Comparison
Q1'FY2008 Year over Year Trending
15,000,000
12,000,000
9,000,000
6,000,000
3,000,000
0
Revenue (USD),Support Revenue (USD)
FYQ1-FY2001
FYQ1-FY2002
FYQ1-FY2003
FYQ1-FY2004
FYQ1-FY2005
FYQ1-FY2006
FYQ1-FY2007
FYQ1-FY2008
Fiscal Quarter
Revenue (USD)
Support Revenue (USD)
Q1'FY2008 Product Comparison
5%
2% 2%
12%
0%
27%
24%
7%
0%
10%
10%
Q2 Workforce Optimization-Prediction
Workforce Optimization-Model
1) Sales Shortfall: (-$ 557,534) Q2'FY2008
2) Deals Shortfall: (-6) Deals Q2'FY2008
3) Average Deals: 1.3 Deals per Worker
4) Worker Turnover: 37%
Status
People
%
Revenue
%
With Sales
1005
54%
$ 89,606,933
44%
Left Sales
697
37%
$ 62,783,218
32%
Unknown
173
9%
$ 48,927,797
24%
Grand Totals
1879
100%
$ 201,317,948
100%
Turnover Details
5) FY Sales Forecasts: Q2 $8M, Q3 $8.2M, Q4 $14.6M
Workforce Optimization-Execution
1) Redeploy from NAS Sales Team:
Betty Lockerty
2) Redeploy New Hire:
Pat Miller
Task(s) Completed (2/13)
3) Retain Sales Representative: 2 Sales Team
4) Hire External Sales People: 2 Sales Reps
Candidates
Invite New
Listing
Amalia Masters (1/3) - Job: IRC1033879
How would you spend your first 30 days working for us?
CLICK TO PLAY
Interested
Not Interested
Forward for Review

Closing Remarks

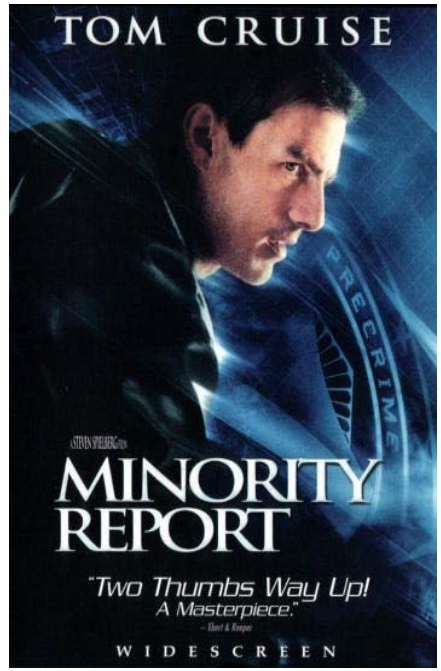
BIWA Summit 2008

Better Information—Better Results

- **Dec. 2-3, 2008** in San Francisco at Oracle HQ Conference Center
- 2nd BIWA Summit—presentations available at www.oraclebiwa.org)
- Currently FREE to join BIWA
- IOUG SIG for users who share expertise and vision dedicated to mutual success in leveraging:
  - Oracle Database-centric BI, Warehousing and Analytics
- BIWA's goals include the sharing of *best practices* and *novel and interesting use cases*

Are We There Yet?

- Data gathering devices are commonplace, even in public places, and gather your personal information
- A central data environment brings together huge amounts of information from disparate sources
- Analytical databases automatically “mine”data, discover patterns and relationships, and make predictions about the future behavior of people



More Information:

Oracle Data Mining 11g

- oracle.com/technology/products/bi/odm/index.html

Oracle Statistical Functions

- http://www.oracle.com/technology/products/bi/stats_fns/index.html

Oracle Business Intelligence Solutions

- oracle.com/bi

http://search.oracle.com

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QUESTIONS
ANSWERS