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零售业商务智能： 提升数据使用价值

金苏榕

数据仓库顾问部

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议程

Y Oracle Retail Intelligence整体解决方案

- Oracle BI的完整架构
- Oracle Retail Intelligence的模型: Retail Accelerator

Y 案例介绍:

- 存储: Amazon – 20TB Oracle RAC/Linux for DW
- 模型: Amazon, Burlington, 7-Eleven

议程

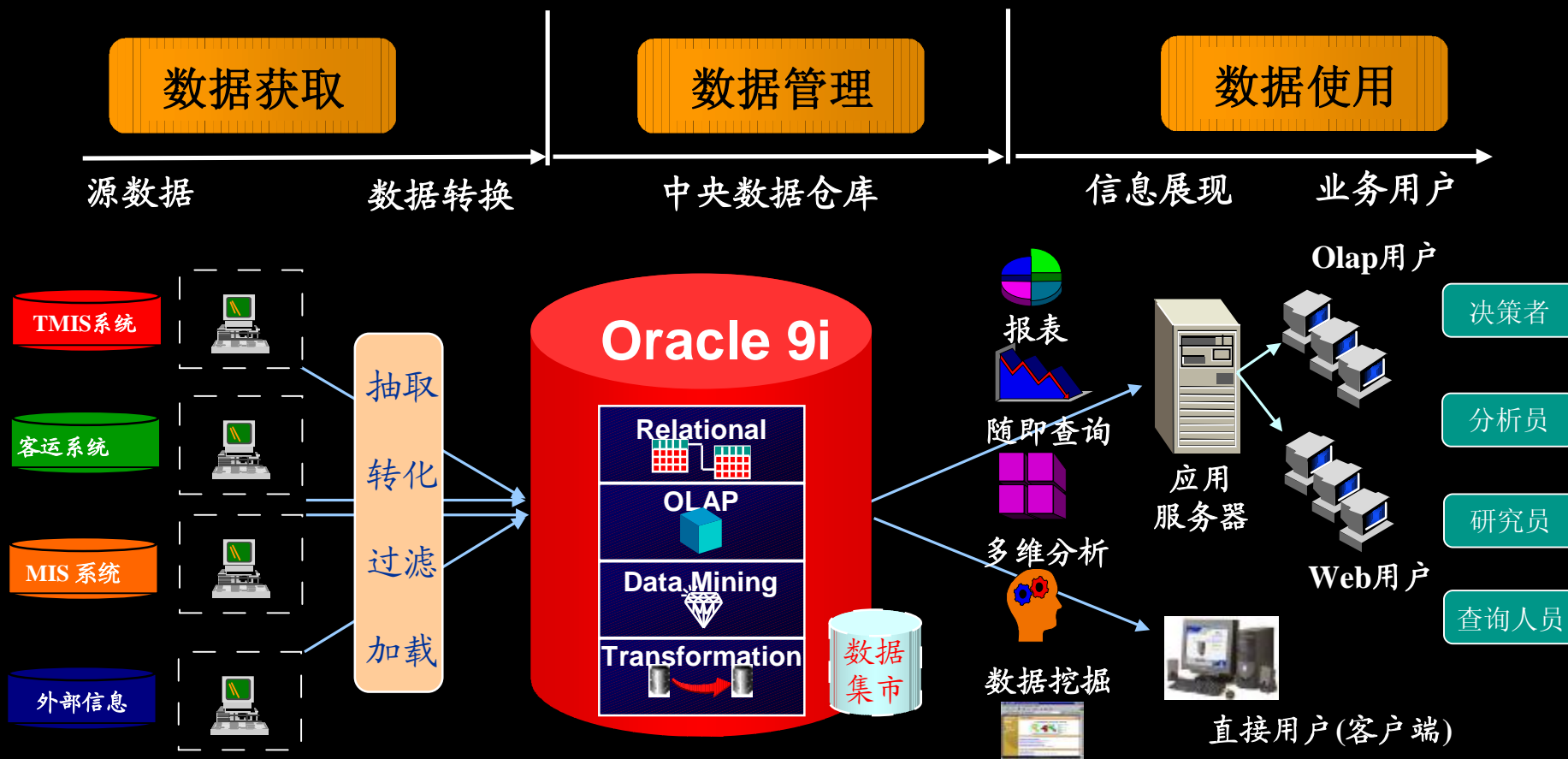
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Oracle 数据仓库的架构



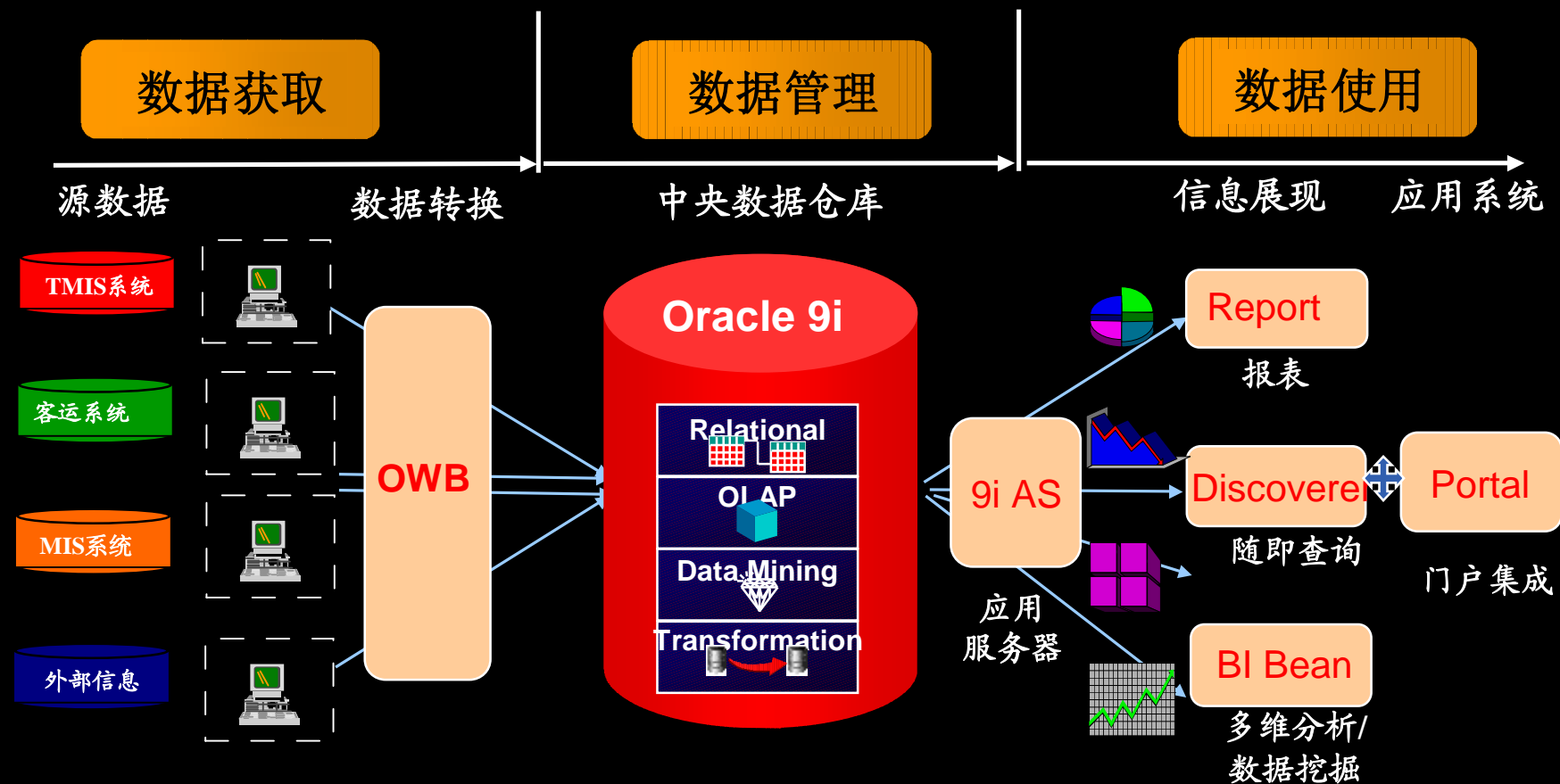
业务规划 信息评估 逻辑数据模型设计 物理数据模型设计 Portal集成

数据库管理 元数据管理 应用开发 顾问咨询 知识转移

项目管理 数据仓库实施指导方法论

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Oracle 数据仓库的架构



业务规划 信息评估 模型设计 **Oracle Warehouse Builder**

管理、开发 **OEM OWB Oracle9iDS** 顾问咨询 知识转移

项目管理、数据仓库方法论 **OPM DWM**

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市场的趋势

“市场成功的关键包括：(1) 可扩展的技术, (2) 拥有成功的先例, (3) 适合行业的解决方案 (4) 开放性. 解决方案的组成部分应该包括：(1) 健壮的数据模型, (2) 包含分析功能的仪表盘和报表 和(3) 内建的ETL功能，能将数据从源系统抽取到分析系统中.”

Bill Swenton, Oracle Consulting (BI & DW)

“BI厂商应该在传统的BI工具之外，提供能打包的分析应用，将其包含在BI工具中.”

“分析应用的厂商应不断增加针对特定行业的分析应用.”

Blumstein, Vesset & Morris, IDC ¹

“研究表明 ... 数据集成和建立以主题为中心的数据集市/数据仓库... 在建立一个分析方案的工作中要占到大约70%的工夫.”

Henry Morris, VP of Research, IDC

¹ Source: Worldwide Business Analytics Software Forecast & Analysis, 2003-2007, IDC, Sept 2003

市场的趋势

Y 转向对解决方案的需求 Move towards Solutions

- 打包的分析功能
- 垂直性 - 满足行业特定的需求

Y 组合的解决方案 Vs. 单独的智能工具

- Portal - 为所有的用户提供智能手段
- 内嵌的应用

¹ Source: Worldwide Business Analytics Software Forecast & Analysis, 2003-2007, IDC, Vesset, Blumstein & Morris, Sept 2003

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Oracle Retail Accelerator- 行业模板

终端用户报告

预建的数据模型

数据仓库 + 分析型
Schemas

集成

6-8 functional portals with 40 reports/workbooks

针对 商店, 供应商, 供应链, 市场& 公司的管理

4-6 零售模型, 包括...

市场篮分析

客户获利分析

其他的按需分析

~ 250 零售measures

~ 150 零售KPI

Retail适配器

ARTs compliant model , Retek

Customer hub adapter

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Portal

公司管理

财务管理

人力资源

日常事务

房地产管理‘

绩效管理

供应链管理

供应链计划

直销

库存管理

分销

生产

供应商管理

供应商计划

分类和空间管理

产品管理

价格管理

促销管避

商店管理

Pos系统

Direct
Touchpoints

客户订单管理

多渠道服务

劳动力管理

日常运作

CRM & 市场

竞争管理

客户信息管理

客户智能

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零售报表模板

Store Operations	Merchandise Management	Loss Prevention
<ul style="list-style-type: none"> § Comp store sales § Competitor stores § Asset turnover § Sales & margin analysis § Inventory turnover § Sales per square foot § Labor analysis § Point of sale analysis 	<ul style="list-style-type: none"> § Sell through analysis § Inventory turns § Weeks of supply § Open to buy § Hot items § In stock % § Markup / markdown analysis § Item contribution 	<ul style="list-style-type: none"> § Store shrink analysis § Return rate analysis § Return reasons § Markdowns § DC shrink analysis § Hot customer report § Hot associate report § Hot store report
Marketing Analysis	Category Management	Customer Analysis
<ul style="list-style-type: none"> § Promotion lift § Price point analysis § Openings analysis § Response analysis § Market share analysis § Openings analysis § Feature / display analysis § Pricing optimization 	<ul style="list-style-type: none"> § Assortment optimization § Category scorecards § Share of shelf § Vendor performance § Category contribution § Market comparison 	<ul style="list-style-type: none"> § Customer segment migration § Customer profitability analysis § RFM analysis § Market basket analysis § Average basket analysis § Shopper penetration § Promotional list optimization

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集成&分析模板

Modeling	3 rd Party Data Services	Functional Adapters
<ul style="list-style-type: none">§ Market basket§ Predictive cross-sell§ RFM scoring§ Customer profitability scoring§ Predictive response model (regression, decision tree, data mining)§ Promotion response model§ Unusual transactions (lost prevention)§ Churn prediction§ etc.	<ul style="list-style-type: none">§ Name & address standardization (Harte Hanks, Acxiom, etc.)§ PRIZM overlays§ Do not call suppression updates§ NCOA mgmt§ Appends (Acxiom, Harte Hanks, etc.)§ FICO scores§ Total Source XL (Equifax)§ Cohorts (Looking Glass)§ Personix (Acxiom)§ etc.	<ul style="list-style-type: none">§ E-Business Suite§ Real-time functional adapters§ Batched functional adapters

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Intelligence: Store Portal


Easily accessible portal highlights key information

Store Manager - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste Address http://intbi-pc1.us.oracle.com:7779/portal/page?_pageid=94,31661&_dad=portal&_schema=PORTAL Go


Links collabsuite



Retail Analytics

[Home](#) [Help](#) [Customize](#) [Logout](#)

Plan Vs Actual

[Customize](#) [About](#) 

	P1-Wk			P2-Mo			P3-Yr		
	Sales	Plan	Percent Change	Sales	Plan	Percent Change	Sales	Plan	Percent Change
01 WOMENSWEAR	84,610,001	67,842,256	24.72%	591,437,920	429,668,698	37.65%	4,910,239,301	3,674,926,542	33.61%
02 FASHION	22,129,858	18,840,086	17.46%	140,588,776	111,926,025	25.61%	1,382,511,911	1,190,774,990	16.10%
03 MENSWEAR	17,474,696	15,124,168	15.54%	156,433,742	118,293,529	32.24%	1,107,528,325	958,164,241	15.59%
04 CHLDWEAR	681,117	301,447	125.95%	4,498,333	1,933,516	132.65%	40,840,171	22,667,024	80.17%
05 SPECIALIST	31,999,367	40,128,840	-20.26%	169,223,281	197,834,880	-14.46%	1,370,888,168	136,220,886	906.37%
07 INTERIORS	42,274,153	14,846,758	184.74%	311,390,684	141,463,697	120.12%	1,815,767,070	879,204,326	106.52%
08 PERFUMERY	7,843,921	8,208,736	-4.44%	45,044,869	42,538,206	5.89%	632,416,046	620,484,352	1.92%
09 FOOD,	4,532,283	4,441,638	2.04%	24,420,570	23,443,747	4.17%	269,872,613	265,824,524	1.52%
Total Sales	\$211,545,394			\$1,443,038,174			\$11,530,063,806		

[View Worksheet](#)

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Next Refresh: Time not available

Local intranet

Advanced Analytics: Market Basket

Embedded data mining supports popular retail models


Market Basket Analysis - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print W Go

Address http://intbi-pc1.us.oracle.com:7779/portal/page?_pageid=94,31647&_dad=portal&_schema=PORTAL

Links collabsuite

 Retail Analytics Home Help Customize Logout

Market Basket

Market Basket Analysis Customize About T x

			Confidence	Support
MORGAN (CN)	MENS UNDERWEAR	KEY FRAGRANCE HOUSES	1	.00043
	BRANDED JEWELLERY		.60000	.00032
	CALVIN KLEIN UNDERWEAR	OTHER SKINCARE HOUSES	.75000	.00032
	KOOKAI (CN)	KEY FRAGRANCE HOUSES	.50000	.00032
	HOSIERY	LINGERIE	1	.00022
SOCKS	COOKWARE	CLARINS	.50000	.00032
		TREES & DECORATIONS	.50000	.00032
	CLARINS	COOKWARE	.60000	.00032
SHIRTS	KURT GEIGER MENS (CN)	ACCESSORIES	1	.00022
	DIOR	NIGHTWEAR	.60000	.00032
	TOILETRY BRANDS	ACCESSORIES	.75000	.00032
	ANDRE BOGAERT	HOSIERY	1	.00022
HOSIERY	CHRISTY SHOP CONSIGNMENT	TREES & DECORATIONS	.60000	.00032

View Worksheet

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Local intranet

Customize T x

Channel Results
Customer Loyalty
Executive Dashboard
Market Basket Analysis
Marketing Resource Center
Profit and Loss Manager
Promotion Lift
Segment Analysis
Store Manager

Customer Analyses

Customer history & profitability modeling supports CRM strategies

Segment Analysis - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media Print View Source Help

Address http://intbi-pc1.us.oracle.com:7779/portal/page?_pageid=94,31764&_dad=portal&_schema=PORTAL

Links collabsuite

Retail Analytics

Home Help Customize Logout

Customer Segment Migration

Customize About

	1998-Q2		1998-Q3		1998-Q4		1999-Q1		1999-Q2	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
ANONYMOUS	63,983	14.58%	65,578	12.99%	83,425	13.45%	48,995	11.91%	52,585	11.49%
CAREER BUILDING	56,650	12.91%	64,926	12.86%	70,928	11.43%	52,632	12.79%	64,323	14.05%
CHILDREN FIRST	89,570	20.42%	105,936	20.99%	139,940	22.55%	94,701	23.01%	107,459	23.48%
MARRIED SOPHISTICATES	91,366	20.83%	108,216	21.44%	138,347	22.30%	90,673	22.03%	106,154	23.19%
OTHERS	61,899	14.11%	70,749	14.02%	73,791	11.89%	47,618	11.57%	42,612	9.31%
SPOUSES AND HOUSES	75,257	17.15%	89,304	17.69%	114,044	18.38%	76,909	18.69%	84,585	18.48%
Total Customers	438,725		504,709		620,475		411,528		457,718	

View Worksheet

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RFM Analysis

Customize About

	GROUP A (100-125)		GROUP B (75-100)		GROUP C (50-75)		GROUP D (25-50)		GROUP E (0-25)	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
ANONYMOUS	2,112	14.41%	3,314	15.08%	8,379	22.88%	23,576	22.99%	64,579	22.91%
CAREER BUILDING	2,023	13.81%	2,971	13.52%	5,166	14.11%	14,696	14.33%	40,070	14.21%
CHILDREN FIRST	3,238	22.10%	5,030	22.89%	8,326	22.73%	15,969	15.57%	43,114	15.29%
MARRIED SOPHISTICATES	3,283	22.40%	5,010	22.80%	5,550	15.15%	16,160	15.76%	46,381	16.45%
OTHERS	2,430	16.58%	3,449	15.70%	5,787	15.80%	23,172	22.60%	63,871	22.65%
SPOUSES AND HOUSES	3,071	20.96%	4,457	20.28%	7,174	19.59%	19,484	19.00%	52,867	18.75%
Total Customers	16,157		24,231		40,382		113,057		310,882	

View Worksheet

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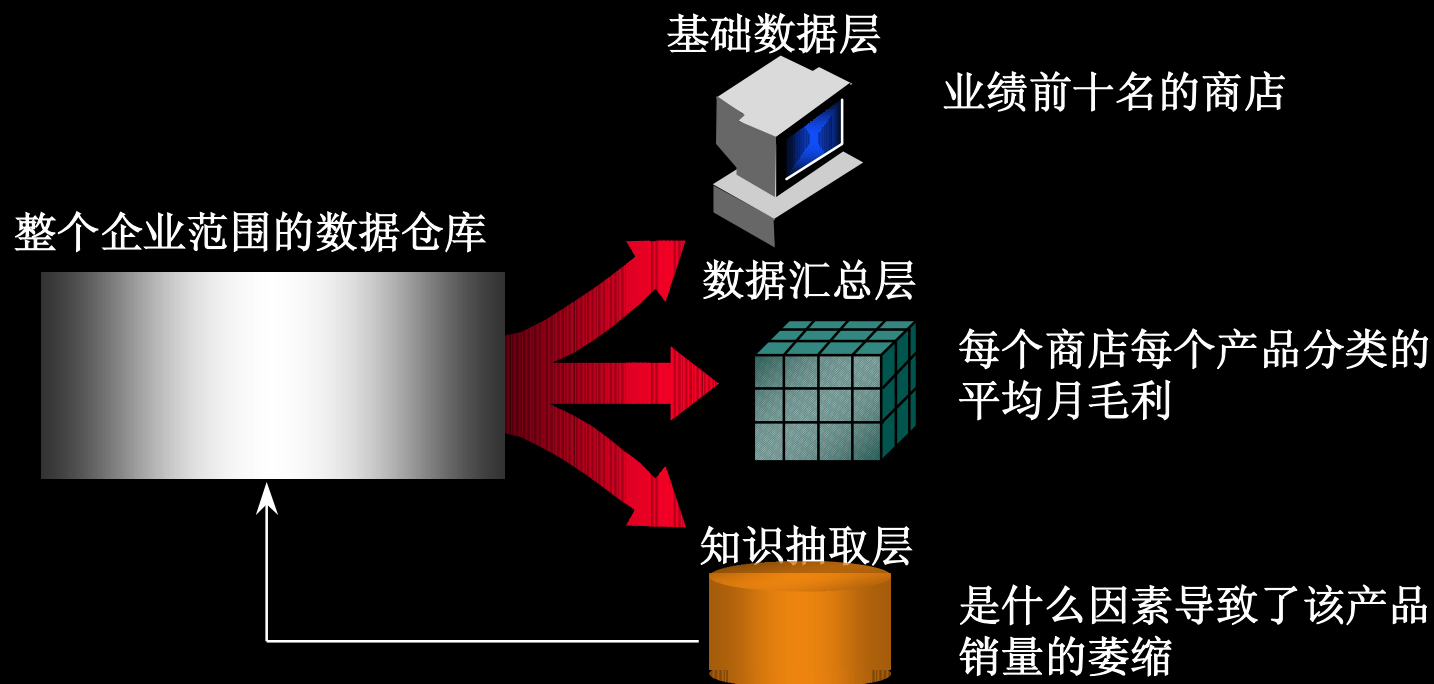
Done Local intranet

Favorites

Customize

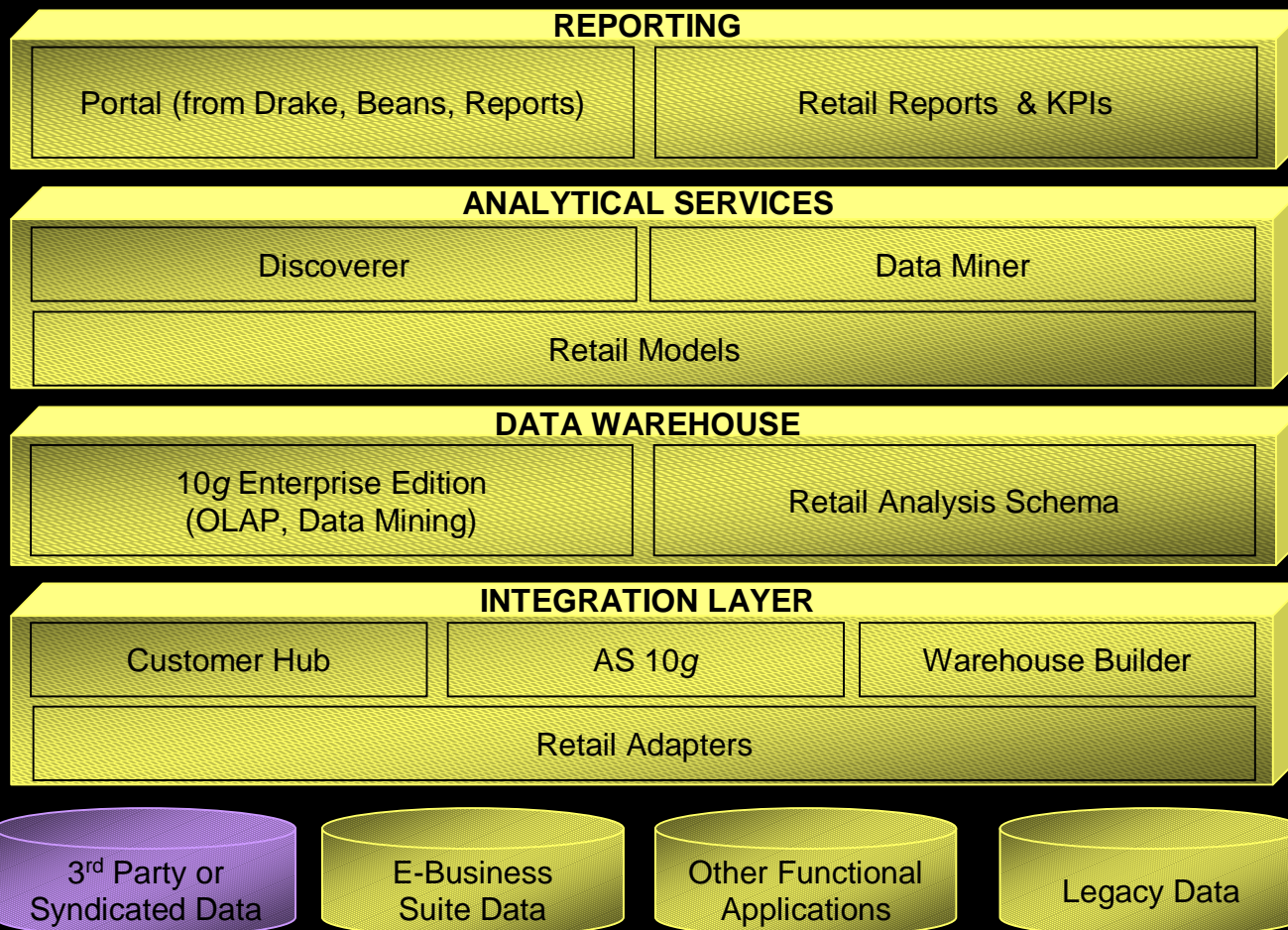
- Channel Results
- Customer Loyalty
- Executive Dashboard
- Market Basket Analysis
- Marketing Resource Center
- Profit and Loss Manager
- Promotion Lift
- Segment Analysis
- Store Manager

界面背后的数据



- Y 以主题为中心组织数据 (Subject Areas)
- Y 以以上三个层次组织数据 (Base, Aggregate, Knowledge)
- Y 使用能访问以上数据的工具

推荐客户采用的配置



Retail Users

§ Executives
§ Functional Organizations

§ Shared Analytical Services
§ Merchandise Analysts
§ Marketing Analysts

§ IT

§ IT
§ Merchandise Analysts
§ Marketing Analysts

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Amazon.com 的案例

20 TB

Oracle RAC/Linux

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Amazon.com面临的系统扩展的挑战

Y 数据中心数据量快速增长

- 1999 500G 用户数据

Y 寻求开放的解决方案- 能有多种硬件平台的支持.

- 2003 10TB 用户数据, 800用户数, 600表, 最大的表 > 100亿行

Y 用户数据量的增长每年以100%的速度增长

Y 查询量每年以两倍的速度增长

- 2004 20TB Oracle RAC/Linux 数据中心

Amazon.com面临的系统性能的挑战

Y 并发量高

- 2003 10TB 用户数据, 800 用户中, 55-60 并发数据, 用户每天提交 3,500 个查询, 高峰时每天达到 4,300 查询
- 2003 并发用户数的增长 20%-30%

Amazon.com面临的系统维护的挑战

Y 数据中心从一个地方迁移到另一个新的数据中心

Y 迁移和升级

- Redbrick -> Oracle

 - Y 花费6个月的时间 (Q4/1999 to Q1/2000)

- Sun E10K -> HP Superdome

 - Y 60天 (Q2/2001); 用户不受影响

- Oracle 8i -> Oracle 9i Release 1

 - Y 包括从第三方的ETL tool迁移到Oracle9i ETL (OWB)

- Oracle R1 -> Oracle 9i R2

- Oracle9iR2 HP-UX -> Oracle9iR2 RAC/Linux(2004)

Y 硬件平台的多样性选择

Amazon.com的评价

Y Oracle9i满足数据量增长

Amazon 升级到Oracle9i 2002 5月

- Partitioning 分区
- External tables 外部表
- SQL MERGE语句

Y Oracle9i满足性能要求

- Oracle composite partitioning

Y Oracle9i易于维护

- 整个数据中心的迁移和维护只需要2个DBA的管理

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Amazon: 使用组合分区

Y Mr. Dunlap.

- 多个子分区使得并发First, the many subpartitions enable highly parallel query.
- Second, the time-based major partitions create a “free” index.

Y Benefits:

- The Oracle optimizer uses the information in the partition key to avoid accessing partitions that cannot contain data relevant to a given query. Since many queries pertain to the most recent month, week or day of data, the partition elimination is a powerful optimization

Amazon: another partitioning sample

Y Move from one data center to a new data center

- In 2001, Amazon moved the data warehouse to a different data center and a new hardware platform.
- This entailed moving the database across the country to an instance of Oracle running on a 64 processor HP Superdome.
- The data was actually exported from the existing Oracle system, transferred via high-speed network to the new Oracle system without ever writing it into a flat file.
- This was possible because of partitioning features of Oracle, in which partitions of the database can be independently moved from one system to another.
- About five partitions were moved in each export operation. The migration occurred with essentially no disruption of users activities and was transparent to end-users.

来自 Amazon.com 的反馈

“Oracle9i is the foundation of our business intelligence initiative. Oracle9i Database scales to the multi-terabyte data warehouse that Amazon.com requires.”

- Rick Dalzell,
Chief Information Officer, Amazon.com

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Winter VLDB调查

超大数据量, 支持决策支持

1998 Survey

1.	Sears	Teradata	4.63
2.	HCIA	Informix	4.50
3.	Wal-Mart	Teradata	4.42
4.	Tele Danmark	DB2	2.84
5.	CitiCorp	DB2	2.47
6.	MCI		
	Informix	1.88	
7.	NDC Health	Oracle	1.85
8.	Sprint	Teradata	1.30
9.	Ford	Oracle	1.20
10.	Axiom	Oracle	1.13

2001 Survey

SBC	Teradata	10.50
First Union	Informix	4.50
Dialog Proprietary		4.25
Telecom Italia	DB2	3.71
FedEx	Teradata	3.70
Office Depot	Teradata	3.08
AT & T	Teradata	2.83
SK C&C	Oracle	2.54
NetZero	Oracle	2.47
Telecom Italia	Informix	2.32

























2003 Survey

France Telecom	Oracle	29.23
AT&T	Proprietary	26.27
SBC	Teradata	24.81
Anonymous	DB2	16.19
Amazon.com	Oracle	23.00
Kmart	Teradata	12.59
Claria Oracle	12.10	
HIRA	Sybase IQ	11.94
FedEx Teradata	9.98	
Vodafone Gmbh	Teradata	9.91

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Oracle TB级数据量 部分客户

Retail	Communications	Financial Services	Consumer Packaged Goods / Manufacturing.
			
			
			
			
			
			

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Every major platform, Every major architecture

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Oracle's Retail Intelligence (零售业商务智能)

Oracle is the leading provider of intelligence solutions to retailers world-wide



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客户成功案例 [\(click here to view case studies\)](#)



“The data warehouse paid for itself very quickly, in about 6 months. Since then the warehouse has continued adding significant value.”

-- Mark Dunlap, Director of Data Warehousing, Amazon.com.



“With Oracle, we knew that if we gave people the right tools, the buying organization would be able to buy better. The evidence is that many of our merchants have had stellar results despite the economy.”

-- Mike Prince, CIO, Burlington Coat Factory Warehouse Corporation.



“The data warehouse provides insight for hundreds of daily business decisions on pricing, merchandising and inventory. 7-Insight allows 7-Eleven to drive while looking through the windshield rather than the rear-view mirror”

-- Keith Morrow, CIO, 7-Eleven.

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客户成功案例

([click here](#) to view document)



Business Overview & Achievements

- 目标: 增加销售&客户满意度
- 订单, 客户, & 库存数据
- 销售分析与产品 市场表现分析
- 市场篮分析
- 产品关联分析
- 页面个性化定制

Technology Achievements

- 10+ TB on Oracle 9i
- 每天4,000 查询; 800用户
- 以Oracle自有的OWB工具替代第三方ETL工具, 充分利用了Oracle数据库的重要特性
- 每天载入数据6次

“The data warehouse at Amazon.com is the single place that we bring everything together...The data warehouse gives us a single place that we can pull all the data together to improve service for our customers and lower costs.”

-- Charlie Bell, Vice President of Technology Infrastructure, Amazon.com.

“The data warehouse paid for itself very quickly, in about 6 months. Since then the warehouse has continued adding significant value.”

-- Mark Dunlap, Director of Data Warehousing, Amazon.com.

“We chose Oracle because it was the only data warehousing solution that could give us a truly integrated view of our business plus keep up with the rapid rate of growth of Amazon.com's business.”

-- Mark Dunlap, Director of Data Warehousing, Amazon.com.

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客户成功案例

([click here](#) to view document)



Business Overview & Achievements

- 目标:通过商业智能的辅助提高毛利率
- 目标: 降低花费在于防范员工欺诈和偷窃上的日常花费
- 库存分析
- 销售审计和防范

Technology Achievements

- 即席查询 & 分析
- 涉及到315商店和 23,000员工

“With Oracle, we knew that if we gave people the right tools, the buying organization would be able to buy better. The evidence is that many of our merchants have had stellar results despite the economy.”

-- Mike Prince, CIO, Burlington Coat Factory Warehouse Corporation.

“Burlington’s Sales Audit and Loss Prevention department is using Oracle to get further details about patterns of what Burlington CIO Mike Prince terms “hanky panky.” “A lot of scams involve a cashier opening a drawer extra times between customer sales to cover their tracks. This doesn’t mean the cashier is stealing. It just means that there’s smoke. Where there’s smoke, there’s frequently fire, and we can observe the fire by going in with Oracle.”

-- Mike Prince, CIO, Burlington Coat Factory Warehouse Corporation.

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The 7-Insight Platform ¹



Subject Areas of Intelligence

- 产品趋势分析
- 产品排名
- 财务分析
- 注销分析
- 机会发现模式
- 气候影响趋势
- 异常报告

Technology Achievements

- 每天夜间载入2200万条记录
- 数据由北美5800家商店提供

“The data warehouse provides insight for hundreds of daily business decisions on pricing, merchandising and inventory. 7-Insight allows 7-Eleven to drive while looking through the windshield rather than the rear-view mirror”

-- Keith Morrow, CIO, 7-Eleven.

“Allows us to test new products using near real-time analytics on them with little or no risk”

-- Keith Morrow, CIO, 7-Eleven.

¹ Information presented at “Customer-Centric Strategies Web Seminar,” produced by Consumer Goods Technology and RIS. To view the webinar, visit the following url (<http://www.placeware.com/cc/esdevents/attend>) and submit edgell0407 as the user name and 947136 as the password.

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