

# Database Growth: Problems & Solutions

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## Agenda



- ◆ The Data Explosion
- ◆ Effects of Database Explosion
  - End User
  - IT Operations
  - Real-world experiences
- ◆ Solutions
- ◆ Q & A

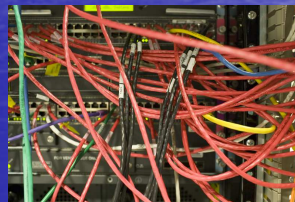


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## The Data Explosion



- ◆ “Data Explosion”: 166,000 Google Hits
- ◆ “Information Life Cycle Management”: 1.3M Google Hits
- ◆ Numerous analyst papers
- ◆ Archiving vendors



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## Data Explosion: Largest OLTP on UNIX Databases



- ◆ Source: Winter Corporation; Top 10 Survey ([www.wintercorp.com](http://www.wintercorp.com))
- ◆ 2003: Max: 5.4 TB, Average 2.5 TB
- ◆ 2005: Max: 16.4 TB, Average 6.8 TB

**Max: 200% Increase**

**Average: 175% Increase**

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## Drivers for Data Explosion



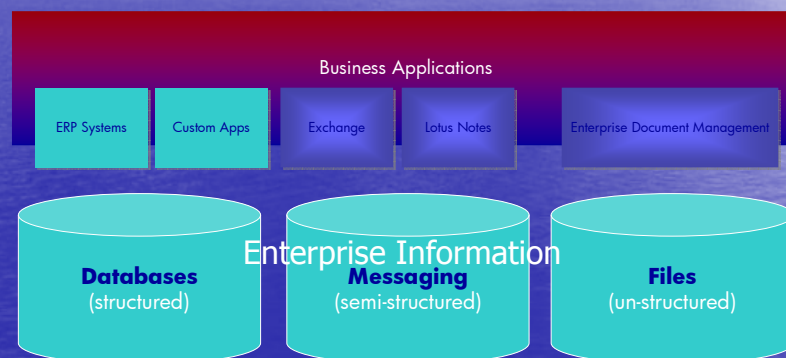
- ◆ Increased regulatory retention requirements
- ◆ Increased business intelligence and trend analysis
- ◆ Increased detail with-in business transactions
- ◆ Consolidation of systems
- ◆ Underlying growth in business volume



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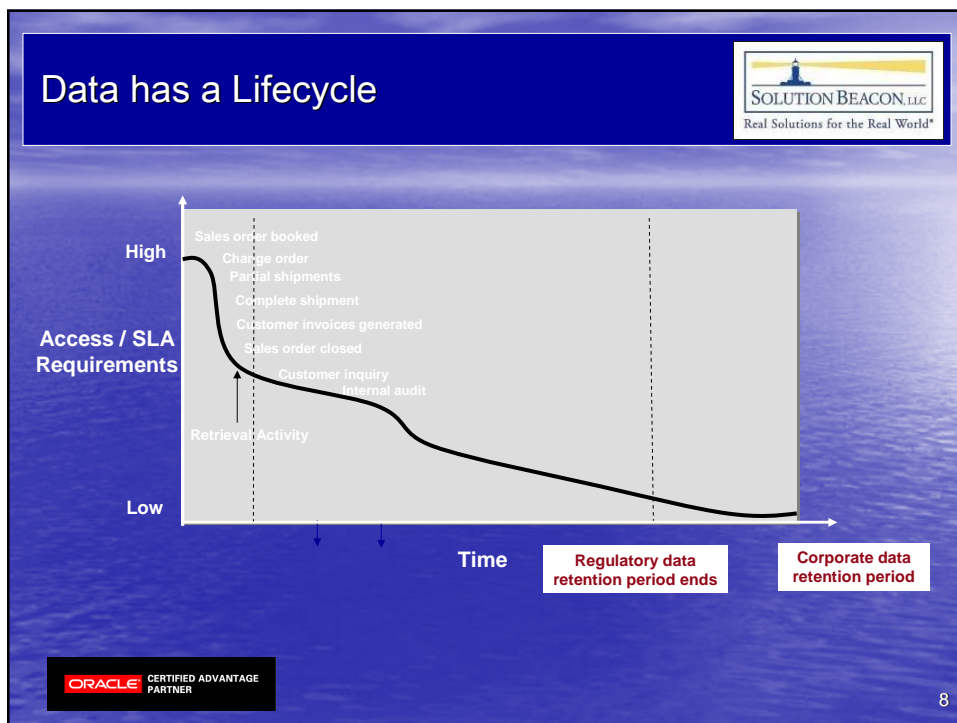
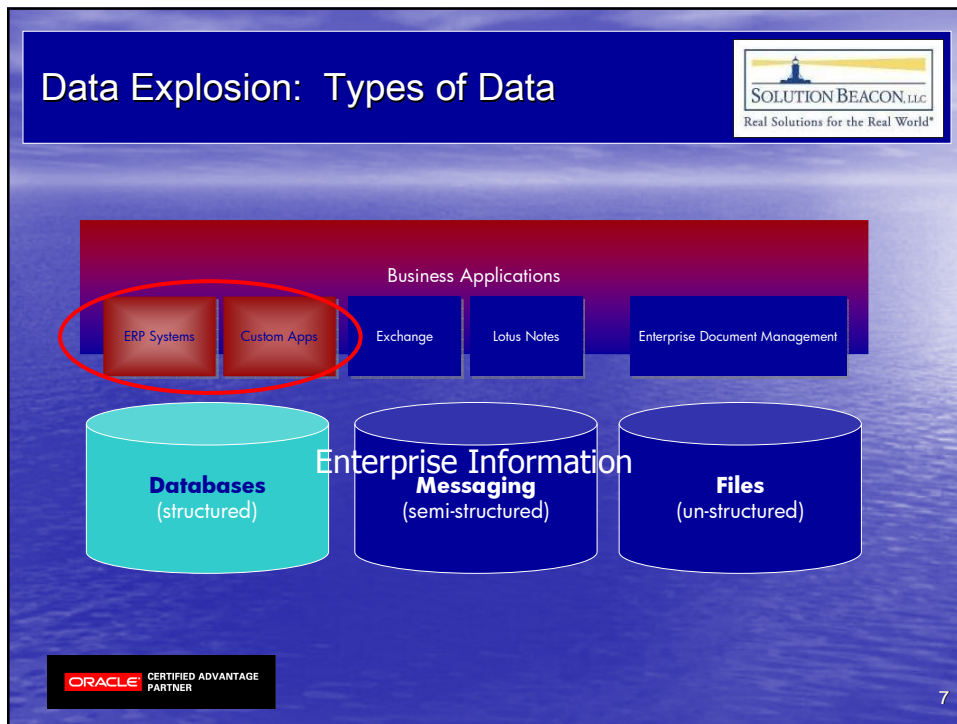
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## Data Explosion: Types of Data



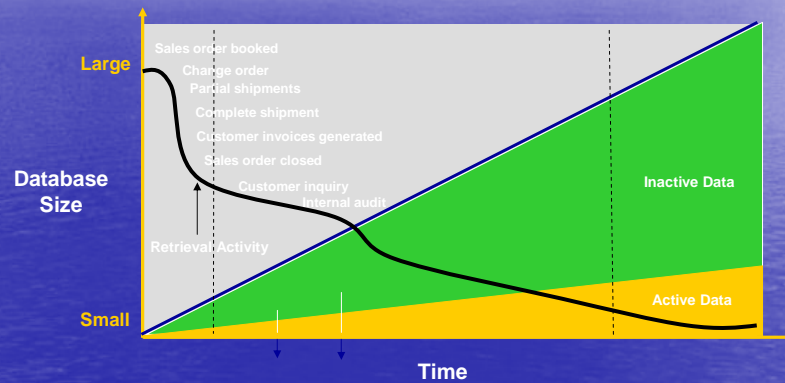
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## Inactive Data



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## End-User



- ◆ Declining application performance
- ◆ Decreased application availability
- ◆ Information overload
  - Is your application presenting irrelevant information to end-user, causing extra work?

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## IT Operations



- ◆ Storage requirements
- ◆ Server requirements
- ◆ Backup and recovery windows
- ◆ Maintenance and upgrades windows
- ◆ Cloning operations
- ◆ Database and Application Tuning

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## Case Studies



- ◆ Only studies that have been published: OAUG, OpenWorld, trade press
- ◆ All Oracle E-Business Suite
- ◆ All *RIM for DB Live Archive* from HP/OuterBay
- ◆ In chronological order

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## Applied Materials – Server Capacity



- ◆ Data growth of 4GB per week
- ◆ 14 clones of Production
- ◆ HP *Live Archive* implementation led to near zero growth
- ◆ Storage savings \$1 MM/year
- ◆ Significant CPU utilization reductions extending server life by several years
- ◆ Runtime reductions on key reports by 50%

Source: Out of Gas on the Biggest Box Made, Now What? Chei Yeh, Director Core Applications *Applied Materials*. OAUG Fall 2001



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## Parsons Brinkerhoff – Upgrade



- ◆ 10.7 to 11i upgrade of EBS
- ◆ Implemented *Live Archive* before upgrade
- ◆ Archive 35% of total DB
- ◆ Reduced Upgrade outage from 12 days to 6 days
- ◆ Allowed 3 clones to be supported on test server instead of 2 pre-archive
- ◆ User agreement for archiving was easy to achieve because of application access to archived data

Source: "Worldwide Upgrade to Oracle 11i: A Recipe for Success" OAUG Europe 2002 by Robert P. Dallesandro Parsons-Brinkerhoff



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## Apollo Group – Upgrade



- ◆ 10.7 to 11i/upgrade window reduction
- ◆ Fixed window over 4<sup>th</sup> July weekend
- ◆ \$50K/day in productivity impact of additional outage window
- ◆ Archived 22% of the 190 GB database pre-archive
- ◆ Reduced outage window by 27%
- ◆ Avoided additional outage
- ◆ Lessons learned: Archive before starting upgrade project

Source: "Oracle 11i Data Upgrade Roadmap – A Lifecycle-Based Approach", Grant Gasson, Director of Financial Systems *Apollo Group, Inc.* Fall 2002 OAUG

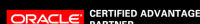


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## Gevity: Storage Costs



- ◆ Reduced budget for storage – \$1.3 savings (2007–2011)
- ◆ Avoid purchase of additional storage (\$664,474) for 2004
- ◆ Dramatically reduce instances by approximately 2TB
  - Saving total storage footprint of 12TB at implementation
- ◆ Additional Benefits
  - Sustainable and predictable performance/storage costs
  - Allows high performance access to clients worldwide via new portal, while managing high performance reqs
  - Greatly reduced backup, recovery and clone times



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## Agilent Technologies: Storage Costs



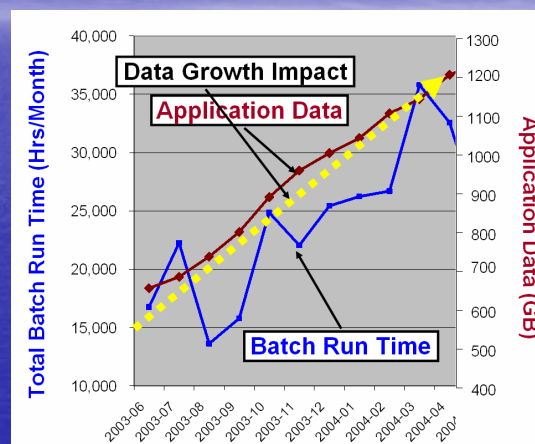
- ◆ Oracle EBS 11/Single world-wide database
- ◆ Growth rate 1TB+ per year
- ◆ 20 + clones to support business initiatives
- ◆ Benefits
  - Savings for Storage: 2.5% of total 2005 IT budget
  - HA, Backup & Recovery reduced spend and time
  - Stable, predictable performance
  - Free up resources for business initiatives

Source: Agilent Case Study: *Strategic Application Data Growth Management*. By Naresh Shanker Sr. Director ERP Solutions, Agilent Technologies, OpenWorld SF 2004



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## Agilent: Tuning – Temporary

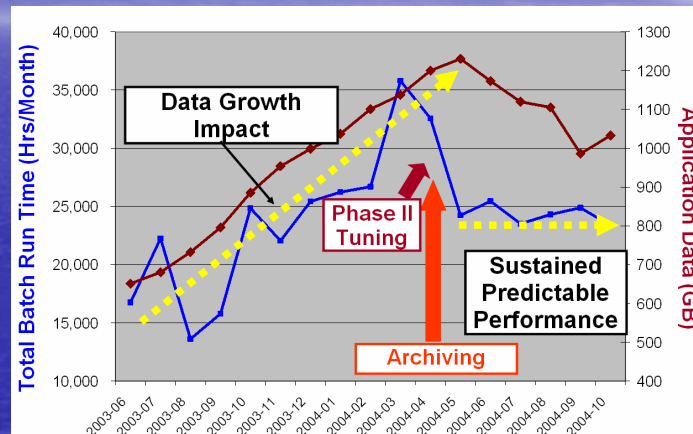


Source: Agilent Case Study: *Strategic Application Data Growth Management*. By Naresh Shanker Sr. Director ERP Solutions, Agilent Technologies, OpenWorld SF 2004



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## Agilent: Archiving = Stability



Source: Agilent Case Study: *Strategic Application Data Growth Management*. By Naresh Shanker Sr. Director ERP Solutions, Agilent Technologies, OpenWorld SF 2004

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## ArvinMeritor – Disaster Recovery



- ◆ 60% reduction in database size
- ◆ 90% reduction in DR window
- ◆ 11 / upgrade outage reduction to 2 days
- ◆ 30% performance improvement
- ◆ Lower database maintenance overhead

Source: Automotive supplier curbs its runaway production database. Marcel Kuijs, director of IT at ArvinMeritor's European IT data center. Storage Network World, July 2005

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## Case Study Themes



- ◆ Many drivers for archiving
  - Performance
  - Upgrade, backup, cloning windows
- ◆ Diverse set of secondary benefits
  - Cost avoidance, storage, servers, tapes
  - Free resources for Strategic Initiatives
- ◆ Benefits accrue to diverse parts of the organization
  - Data center
  - Business user
  - Application Support staff

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## Solutions



## Possible Solutions



- ◆ Data Deletion / Purging
- ◆ Add Capacity through Hardware Upgrades
- ◆ Decentralize or Do Not Consolidate
- ◆ Database Partitioning
- ◆ Database Archiving



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## Solutions: Data Deletion/Purging



- ◆ Some data is not subject to regulatory requirements and has no ongoing business value
- ◆ Candidates:
  - Concurrent request data
  - MRP runs, Workflows, etc.
  - Temporary and Interface Tables

### Some Challenges!

- Introduces risk and exposure to meet legal and compliance requirements
- No recourse, once the data is gone it is gone forever
- No validation for full data integrate

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## Solutions: Add Capacity Through Hardware Upgrades



### ◆ Storage

### ◆ Server

- Scale up
- Scale out (RAC)

### ◆ Network



### Some Challenges!

- Doesn't solve the root cause, "Hardware Acquisition Treadmill"
- One CIO observes: **"Each time I buy storage, it requires more software, backup, array and bandwidth"**



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## Solutions: Decentralize or Do Not Consolidate



### ◆ Sometimes managing two medium-sized databases is easier than managing one large database

### Some Challenges!

- Gives up all the advantages of consolidation
  - IT Operations
  - Consolidating reporting, etc...

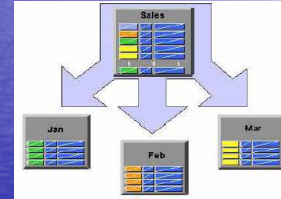


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## Solutions: Database Partitioning



- ◆ Oracle feature for managing large tables
- ◆ Improves performance if queries are able to use partition keys
- ◆ “Life cycle” of data may leave active data in same partition as inactive data



### Some Challenges!

- Does not address core data growth issue
- Provides no help in compliance, data retention
- Application must be tuned for partitioning



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## Solutions: Database Archiving



- ◆ Remove data from OLTP Databases while retaining ability to access
  - Database Backups/Snapshots
  - Exports, CSV files
  - XML Files or other self-describing format
  - Relocation to secondary database
    - ◆ Access via reporting tools or business analytics
    - ◆ Access via native application
  - Maintain full data integrity

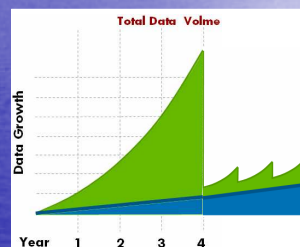
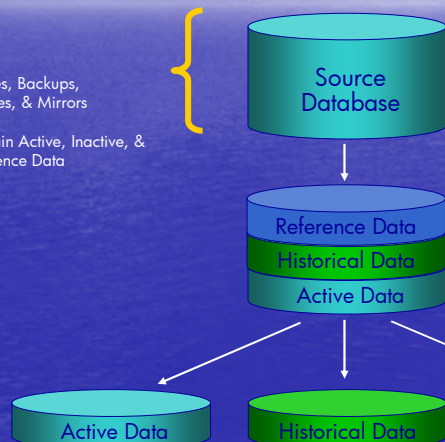


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## Application Data Management: Key Concepts



Copies, Backups,  
Clones, & Mirrors  
  
Contain Active, Inactive, &  
Reference Data



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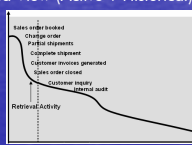
## Application Data Management: Key Concepts



Active Only View



Combined View (Active + Historical)



Application Independent



PeopleSoft ORACLE JDE EDWARDS SIEBEL Home Grown  
Business Applications



.XSD  
.XML  
Reference  
Data

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## Test Data Management: Key Concepts



PeopleSoft ORACLE EDWARDS SIEBEL Home Grown  
Non-Production Business Applications

Policy(s)



Subset Operations

Development XXX5880

Quality XXX5884

Training XXX5886

Performance XXX5888

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## RIM for Databases: Product Suite



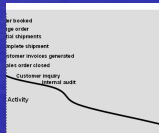
### Application Data Management

- Database to Database with Native Access
- Database to File for Decommissioning & Snapshots

Active Data

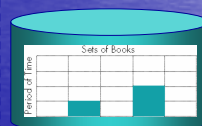
Historical Data

.XSD  
.XML  
Reference Data

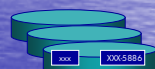


### Test Data Management

- Database Subsetting
- Data Masking and Securing Data (Through partnership with Camouflage)



Subsets

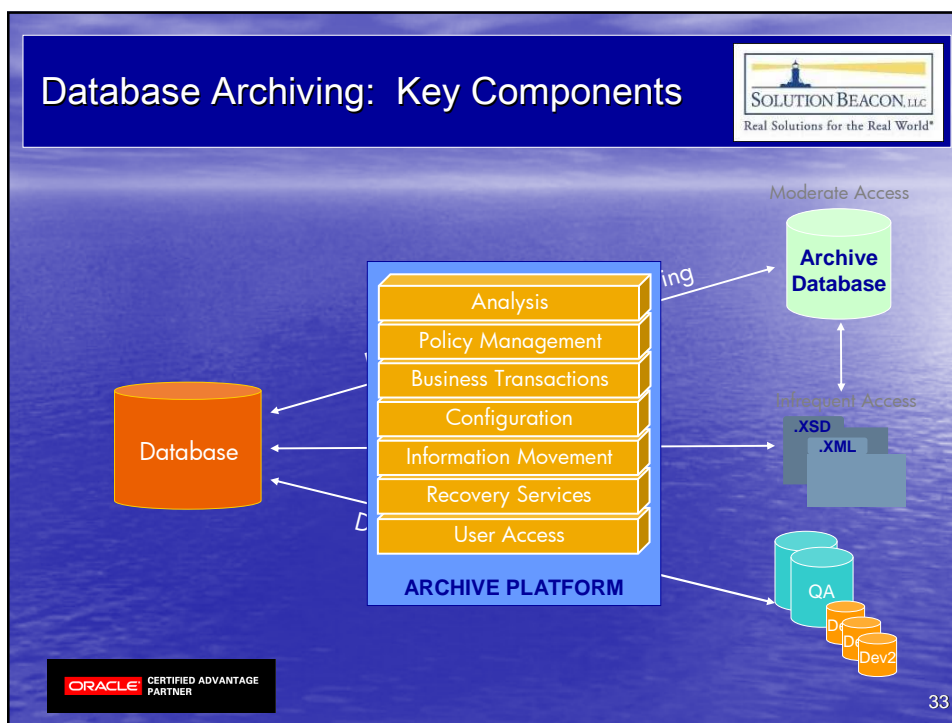


Data Masking

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## Questions and Answers



## Conclusion



- ◆ Plan for archiving!
- ◆ Understand the impact of doing nothing
- ◆ Make it part of your Fusion strategy



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## Plan for Archiving: Next Steps Data Collection Scripts (DCS) Offer



- ◆ Database measurement at a point in time
  - Snapshot
- ◆ Integral part of the Discovery process
  - Non-intrusive to actual data
- ◆ Provides data/module distribution
  - Oracle Applications
  - PeopleSoft
- ◆ Provides mappings to pre-packaged modules
- ◆ Understand growth trends & areas of growth



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## Next Steps – How to Access DCS



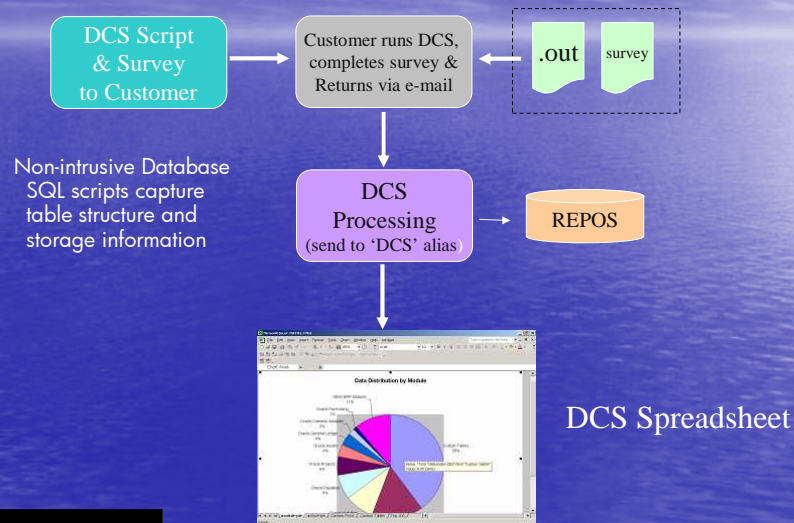
### No-Cost Data Collection Script Analysis

- ◆ Customer receives SQL via email
- ◆ Script is run against production database
- ◆ Email results to Eric Popiel ([eric.popiel@hp.com](mailto:eric.popiel@hp.com))
- ◆ HP analyzes results and provides feedback & recommendations within 2 weeks
- ◆ Provides growth data & basis for ROI
  - Storage optimization and projected performance increases



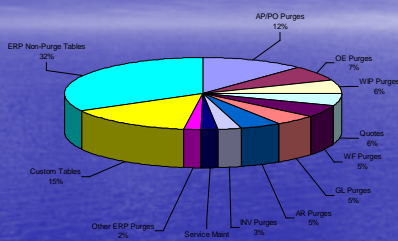
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## Summary: The DCS Process



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## Sample DCS Chart



### Archive Module-

AR Purges  
GL Purges  
WF Purges  
Other ERP Purges  
Custom Tables  
ERP Non-Purge Tables

Months of retention	GB in archive module subject to archive	Pct of data archived (initial archive)	Initial Archive	Remaining Data
12	83.81	60.00%	50.29	33.52
24	19.40	20.00%	3.88	15.52
3	3.19	90.00%	2.87	0.32
7	0.32	76.67%	0.25	0.07
7	15.03	76.67%	11.52	3.51
7	23.39	76.67%	17.93	5.46
Totals ---->	145.14		86.74	58.40



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## Questions and Answers



Thank you!

Eric Popiel

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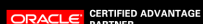
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