



## Religion, Revelation, Revolution!

### Best Practices for Managing Databases

*New York Metro Area Oracle User Group Day 2005*

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## Abstract

- The complexity of managing databases has increased so significantly some are considering Outsourcing as their only relief.
- New regulations are driving IT Governance that further increases the pressure on IT as ways are sought to reduce costs and still effectively manage the myriad of databases supporting business. Auditors, consultants, ITIL, COBIT, ISO, Six Sigma - what is a DBA to do?
- This presentation focuses on the new business challenges, best practices approach to managing relational databases, and where and how database administrators should be educating themselves and spending their time to be successful in business.

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## Agenda

- Challenges
  - Business
  - Technology
- Advisement
- Focus
- Next Steps
- Summary

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## How IT Perceived

- As a cost - as an investment
- Centralized – decentralized
- Retain expertise in-house – outsource
- Use COT – innovate new
- Formal – ad-hoc

**Clear business championship trumps any IT role**

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## Top Concerns

- IT and business alignment
- IT strategic planning
- Security and privacy
- Attracting, developing, and retaining IT professionals
- Measuring the value of IT
- Measuring the performance of the IT organization
- Speed and agility
- Creating an information architecture
- Reducing complexity
- Reengineering business process

Data: Society for Information Management  
<http://www.optimizemag.com/issue/026/management.htm>

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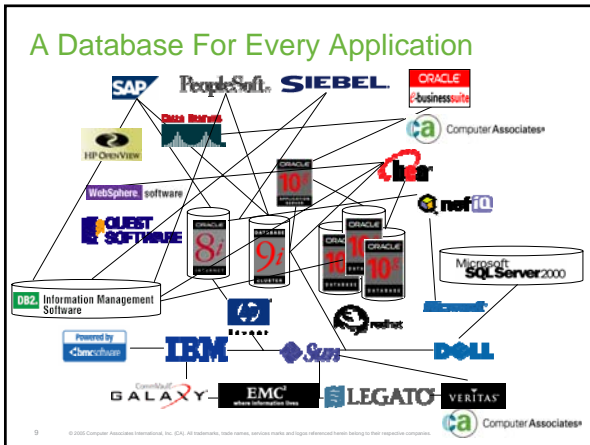
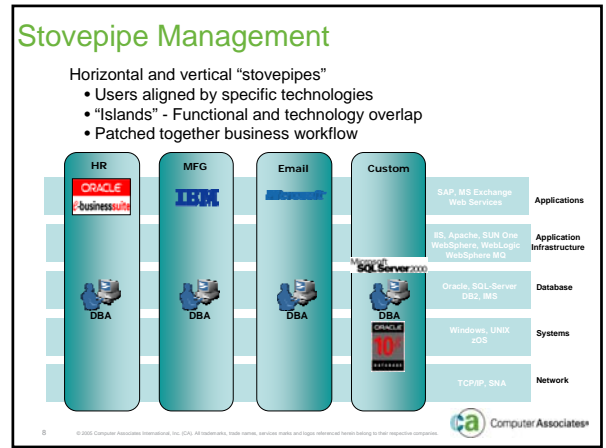
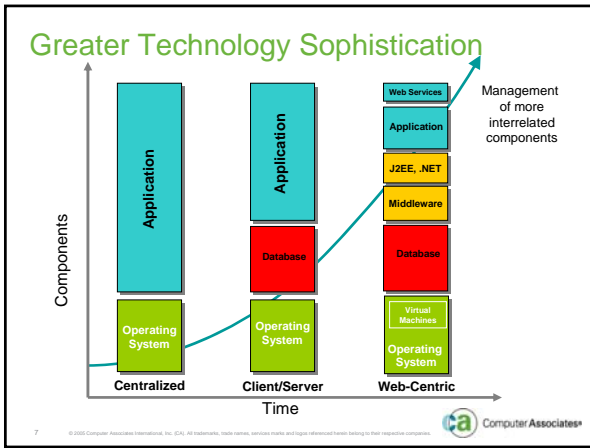
## Oracle – Managing IT

- Business is dependent on optimum performance from packaged and custom software applications
  - Each underpinned by a complex fabric of infrastructure
  - Databases constantly evolving with business change
  - Increasing size and complexity driving need for automation and technology
- “Oracle” no longer just means database

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### Operations

- "100% of ERP, 93% of supply chain and 71% of e-commerce applications will use an RDBMS. The average cost of a minute of downtime for these applications is \$7,900, \$6,600 and \$7,800 respectively." The Standish Group International FIVE "T'S" OF DATABASE AVAILABILITY
- "Software errors resulting from inadequate testing cost the U.S. economy an estimated \$60 billion annually. Remediation after an application goes "live" is up to 30 times higher than early detection and fixes. 2002 U.S. Department of Commerce study
- Industry Analyst estimates software testing costs 25% to 50% of total development costs". <http://www.optimizemag.com/article/showArticle.jhtml?articleId=161501540&ppno=4>
- Drowning in Data - A flood of corporate data, intensified by Sarbanes-Oxley compliance, threatens to overwhelm business managers. John Goff, CFO Magazine November 01, 2003
- "We have to take the DBA out of the picture. You can't spend people doing things machines can do." Pat Seelinger, IBM, Director of Database Integration, eWEEK, 20 August 2001
- "Your problem is all the junk you've bought over the last 20 years, which barely works as it is, you've got to throw away everything you have." Larry Ellison OOW 1999
- "I used to think that the problem with American business was a lack of focus. Now I realize that it's a lack of courage." Jeff Forworthy

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### Challenge

#### Business

- Budget pressure
  - Lower total cost of ownership
  - Hardware, Software, vendor consolidations
  - DBAs managing more
- Regulatory compliance
  - Affected business data stored in databases
  - IT unaware, unprepared, ill-equipped
- IT governance
  - Business critical availability supporting applications
  - Increasing reliance of "Always Available" data
  - Manage without impacting business

#### IT

- Increasing technical complexity
  - Increasing number of new DB objects
  - Internet enablement, web services access
  - Complex applications—many intertwined parts
- Growing databases
  - Ensure business availability of the data
  - Reduce increasing maintenance time
  - Reducing risk and protecting data in each operation
- Managing as one, not separate entities
  - Applications reliant upon databases, infrastructure, and services
  - Services Oriented Architecture
  - Business Service Optimization

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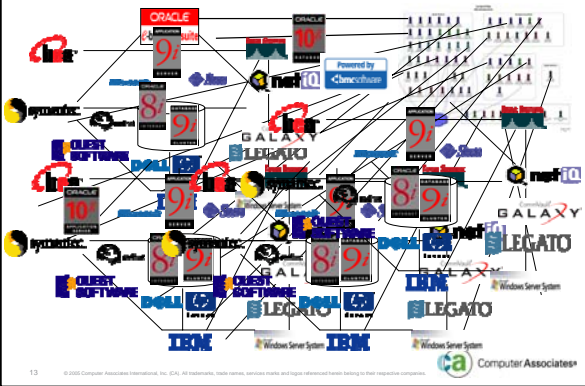
### Service Levels

- What is impacting business?
- Who is it impacting?
- Where is the problem?
- Whose problem is it?
- When can it be fixed?
- How can it be prevented?

Service levels not being met, business unhappy with IT

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## Unresponsive, Costly To Manage, Risk



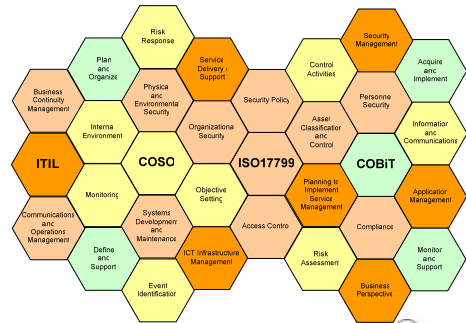
## Regulatory Compliance

Industry Samples	Sarbanes-Oxley	HIPAA	Gramm-Leach-Bliley	Patriot Act	California Senate Bill 1386	VISA CSSIP Mastercard SDP AMEX
Financial Institutions	✓		✓	✓		
Healthcare Industry	✓	✓				
Credit card Processing	✓					✓
Insurance	✓	✓				
Manufacturing	✓					
Telco	✓			✓		
Retail	✓					✓
Academia	✓		✓	✓ SEVIS		
Collect bank or SSN	✓		✓			
Company storing CA resident info	✓				✓	

## Under The Microscope

- Thought Y2K remediation was a project, at least it had an end date...
- Sarbanes-Oxley
  - Controls related to initiating, authorizing, recording, processing, and reporting of financial data
    - General Controls
      - Security (logical and physical)
      - Change management
      - Back-up and recovery
      - Job scheduling and operations, etc.
    - Application Controls
      - Input, output, alteration and validation of data
      - Disallowance of duplicate transactions
      - Processing error correction
      - Processing report accuracy
  - Global company or Internet
    - Basel II and other international regulations

## Compliance Is About Methods and Controls



## IT Governance

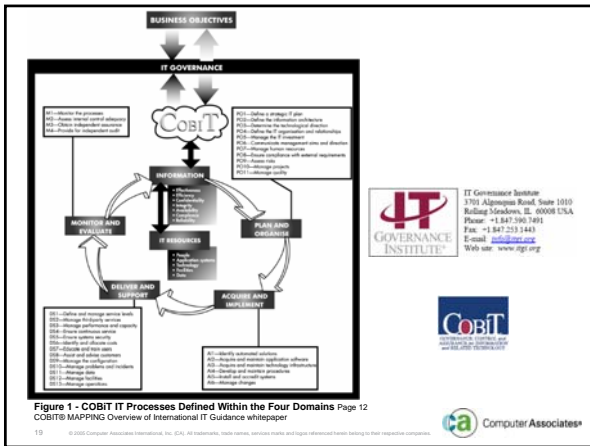
### Best Practices

#### What Control Framework does your company utilize?

- ITIL
- COSO
- SEI CMM (six sigma)
- ISO
- Homegrown
- Don't know or have one

## Generic CMM – ITIL Model

0	Absence	Absolutely no evidence of any activities supporting the process
1	Initiation	There are ad-hoc activities present, but no awareness of how they relate to each other within a single process
2	Awareness	Awareness of process but some activities are still incomplete or inconsistent; there is no overall measuring or control
3	Control	Process is well understood and implemented as a single process but is not integrated with other processes. It is at this point that the maturity has achieved Operational level and begun to penetrate into the Tactical level.
4	Management	Process is now managed by incorporating financial management, forward scheduling, trends analysis, business relationships & is integrated with other IT systems and service processes. The process is now contributing to the Tactical requirements
5	Strategic	Process is fully integrated with business processes to provide a platform for the Strategic Level Executives to make reliable business decisions using the power of their technology resources.

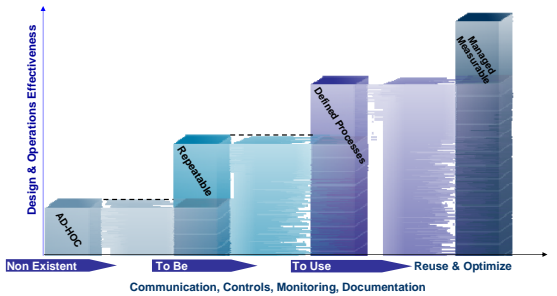


## Processes

- Key Controls include
  - Separation of duties
  - Effective change management
  - Effective change documentation
  - Release processes
  - Resolution processes
  - Communication
  - Monitoring
  - Evaluation of design effectiveness
  - Testing of operations effectiveness
- Prevents
  - Authorized users accessing or altering data accidentally or deliberately
  - Unauthorized access or changes
  - Gaps in policy or procedures making data vulnerable to access or change

## Reliability And Repeatability

Understanding maturity level of processes, resources and technology determines level of effectiveness and provides a path towards optimized operation



## Effectiveness Maturity

- Unreliable
  - Policies and procedures not documented
  - Staff not aware of control responsibilities
  - No measurement or monitoring
- Insufficient
  - Controls exist but not documented or demonstrated
  - Monitoring, violations reported but process not documented
  - Some aware of control responsibilities
  - Effectiveness of controls not evaluated on a regular basis or take too long to fix
- Effective
  - Controls documented, can be demonstrated
  - Staff aware of their control responsibilities
  - Monitoring, reporting, escalating and reporting effective, documented
  - Deficiencies identified and remedied in a timely manner
- Established and Repeatable
  - Annual enterprise-wide risk management
  - Staff continuously made aware of responsibilities
  - Real-time monitoring, periodic self-assessment
  - Gaps remedied as they are discovered
  - Minimal effort on documentation updates, testing, and remediation

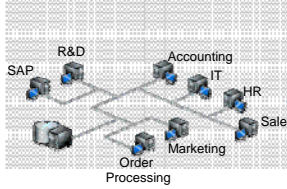
## The Trend - SOA

- Become Services Oriented
  - From IT centric to customer service focused
  - Managing from customer's perspective
    - Not by technology type
  - Not reactive – someone called, now find and fix
    - Instead proactive management
  - Active management of entire infrastructure & services
    - Knowing all assets, systematically managing changes planned and un-planned
  - Continuous Improvement – Dr W. Edwards Deming

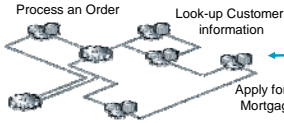
## Service Oriented Architecture

- Systems exposing and providing access to functions and data appropriately
- Open interoperable protocols
- Architecture of connected systems offering shared services
  - Standards based Web Services
  - Loosely coupled to application processes, subscriber unaffected by changes by the publisher
  - Decouple hard-wired one-to-one relationships and encapsulate legacy business logic and repurpose
    - Enables reuse of existing systems as service providers

## Moving Towards SOA



**Traditional IT Infrastructure**  
Tightly coupled application environment  
Everything organized into silos



**Services Oriented**  
Loosely coupled interdependent, shared applications enterprise operability

## Planning & Projects

- Outsourcing
  - Lack of process and or control leads many organizations to outsourcing
  - May help short-term but every organization eventually must address improving process maturity
- Repeatable best practice processes and procedures
  - Industry standards based
- Automation
  - Inventory, provision, patch, and reallocate IT resources such as applications, servers, storage, and networks
  - Automation requires a high level of process maturity
- Reorganize groups that specialize by technology type and don't report to a common IT structure
  - Well-defined roles and responsibilities and documented
  - Business Managers paired with IT teams
  - Company owns technology, not one group

## Moving Forward Requires Change

- "The world hates change, yet it is the only thing that has brought progress" Charles Kettering
- "People are very open-minded about new things - as long as they're exactly like the old ones" Charles Kettering
- "For those who can't handle change please see the door and don't forget your box" Steve Lemme

Change is the price tag for improvement

## Getting Aligned

- IT not be organized by technology type or function
- Customer first, teamwork, service mentality key tenets
- Best practices, standards, and reuse
- Shared services supporting business- logic and task workflow
- Fact driven service measurement prevents massive over-provisioning of hardware for each application
- Easy and logical interfaces and abstraction to hide complexity
- Architecture with loose coupling and modularity for flexibility and resiliency

## Simplification

- Real-time infrastructure
  - Self-managing / self-healing
- Increased utilization
  - Virtualization / provisioning
  - Scale through automation, not labor
- IT aligned with the business
  - Manage service levels by business process
  - Financial administration for IT

## Repurposing DBAs

- With Oracle 10g, DBAs responsibilities changed
  - No more hiding in cubes tweaking buffer cache hit ratios
  - They must evolve or risk being left behind or antiquated
- Installs and enables self-management of different databases across different platforms
- Manages objects, flow and exchange of data between different databases and application
- Helps ensure database capacity no matter the demand to service the business

## Evolving Responsibility

- Grid management
- Workload and workflow management
- Services provisioning management
- High availability & recoverability management
- Messaging and Web Service Management
- Data warehouse and OLAP management
- Security management
- Application management

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## To Enable Self-Managing Capabilities

### Reactive

- Heroics keeping existing databases up
  - Databases getting larger, more complex
  - Business demands increasing for data
  - Database maintenance without impact
- Problem response reactive
  - Engaging problem after business impact
  - How fast can I get rid of the trouble ticket
  - Inconclusive problem resolution – “Lets REBOOT, see if that fixes it”
- Database centric, not business serving
  - May not care, someone else’s problem
  - “Just want a tool to show it’s not my problem”
  - Increasing complexity or perform manually

### Proactive

- Knowing databases deployed and usage
  - Tracking and measurable efficiency
- Business requirements designed, modeled
- Keeping aligned with business
  - When service levels not met, direct and indirect impact costs known
  - Sophisticated monitoring preventing impact
  - Standardized and optimized administration
  - Ensuring availability of data for business decisions and operations
- Keeping databases available in coordination with infrastructure dependencies
  - Integration enabling automation
  - Technology to conquer complexity, cost

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## Stop, Review, Assess

- Assets
  - Hardware, software, and people
- Process
  - Manage by reaction or exception
  - Manage by Best Practice
- Repeatability, Reusability
  - Isolated
  - Hoarded
  - Shared

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## Review and Prepare

- Data integrity ownership and responsibilities communicated to appropriate data/business owners acceptance of responsibilities
- Key database systems inventoried and owners identified
- Staff understands and accepts their responsibility regarding internal controls
- Division of roles and responsibilities (segregation of duties) that prevents a single person from unauthorized alterations
- Review documented processes
- Review documented management risks
- Documented management process controls
- Testing of management control methods
- Gap identification and controls improvement process
- Update management processes and document controls

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## Becoming Optimized

- Operations today is reactive and inefficient
  - Supporting everything is the norm and not the exception
  - Heroics keeping things running
  - Every hour of time used
- Transform to aware, proactive and process driven
  - Of course with fewer resources
  - Optimize maximize business return
  - Improve overall service levels to the business
- Start with use-cases
  - Plan for reuse
- Doesn’t happen overnight
  - Requires focus, change
  - People, process, technology

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## Ingredients To Successful Operations

- People
  - Talented team with architecture, development and operations expertise
- Process
  - Documented and practiced process to analyze, prioritize, develop, test, implement and learn
- Technology
  - Make informed decisions faster and perform corrections more efficiently
- Possibilities
  - With people, process, and technology, the potential is limitless

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## Summary

- It's not just about a new database release like 10g
- It's about the impact, business usage, of new technology and how it will be managed across your enterprise
  - Enable new service offerings and business models
    - Have a business-oriented view regardless of technology type
    - Synchronize management with business objectives
  - Proactively manage it across the enterprise
    - Deliver consistent levels of service
    - Ensure efficient use of resources



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## Help Is Available – Partner With CA

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  - CA technology for multi-database management
    - [www.ca.com/databasemanagement](http://www.ca.com/databasemanagement)
  - CA technology to assist with compliance
    - <http://www3.ca.com/technologies/subsolution.asp?tid=4846>
  - Free downloads [www.ca.com/trials](http://www.ca.com/trials)
    - Unicenter® SQL-Station®
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## Questions?

- Resources to get started
  - IOUG
    - [www.ioug.org](http://www.ioug.org)
  - NYOUG
    - [www.nyoug.org](http://www.nyoug.org)
  - Connecticut Oracle Users Group
    - [www.ctoug.org](http://www.ctoug.org)
  - Oracle OTN
    - [www.oracle.com](http://www.oracle.com)
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