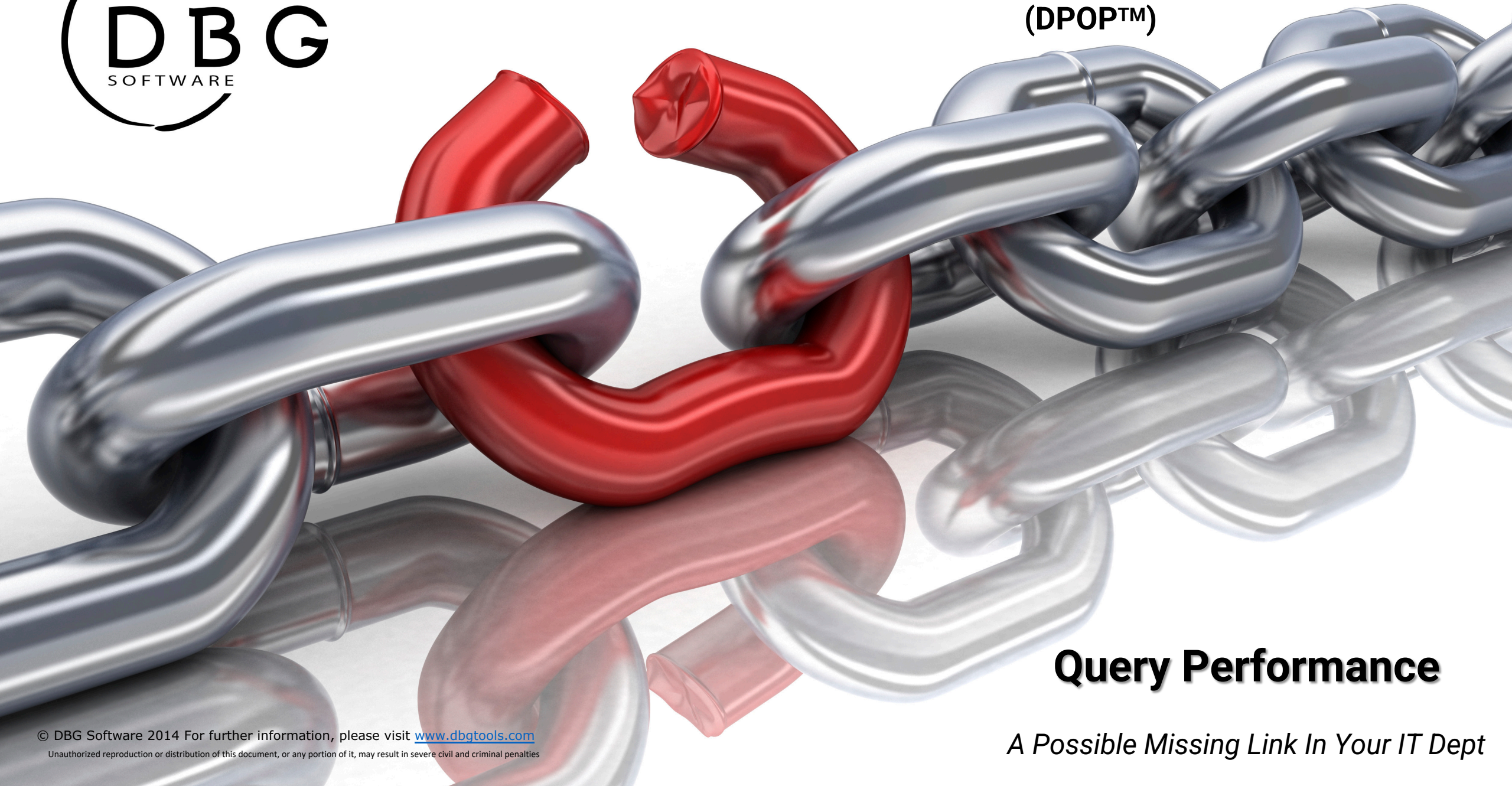




# Database Performance Optimization Practice (DPOPT™)



## Query Performance

*A Possible Missing Link In Your IT Dept*

# Background

## 34+ Years Experience Tuning

- Oracle
- SQL Server
- Postgres
- MySQL/MariaDB
- DB2
- Various (Teradata, Informix, etc.)

**-Consulted for over 300 companies**

**-Sharable testimonials can be found [HERE](#)**



# Agenda

## **1. Define End-To-End Performance**

## **2. Query Performance – Current State**

- The Ripple Effect

## **3. The Missing Link**

## **4. Typical Sales Flow**

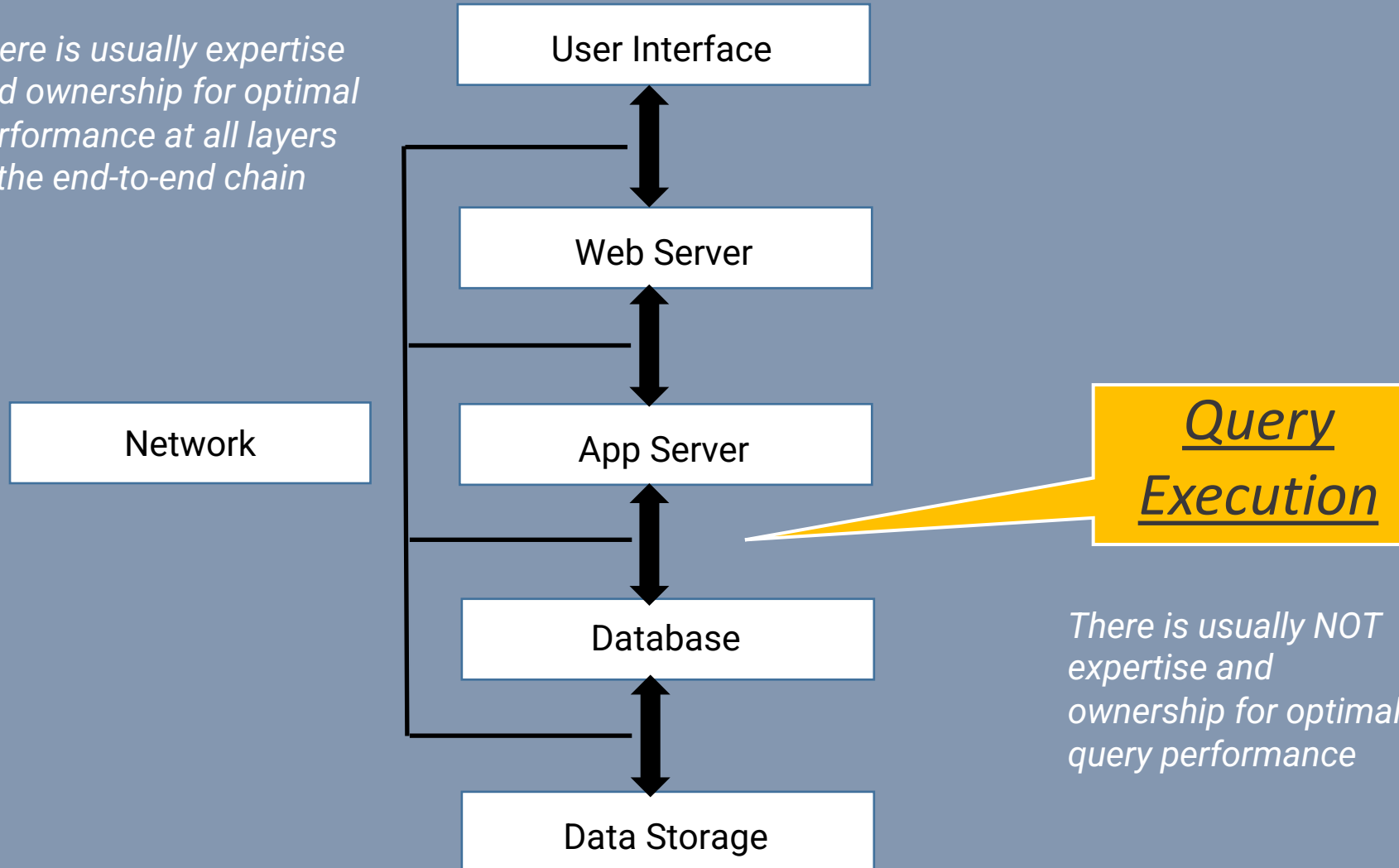
## **5. DPOP – What is it?**

- How To Implement It
- Typical Impact & Results
- Define Methodology
- Success Factors



# End-to-End Performance

*There is usually expertise and ownership for optimal performance at all layers in the end-to-end chain*



# Query Performance – Current State

## Developers write queries

- They “own” the query code
- Point finger at DBA’s for query performance issues

## DBA’s tune queries when needed

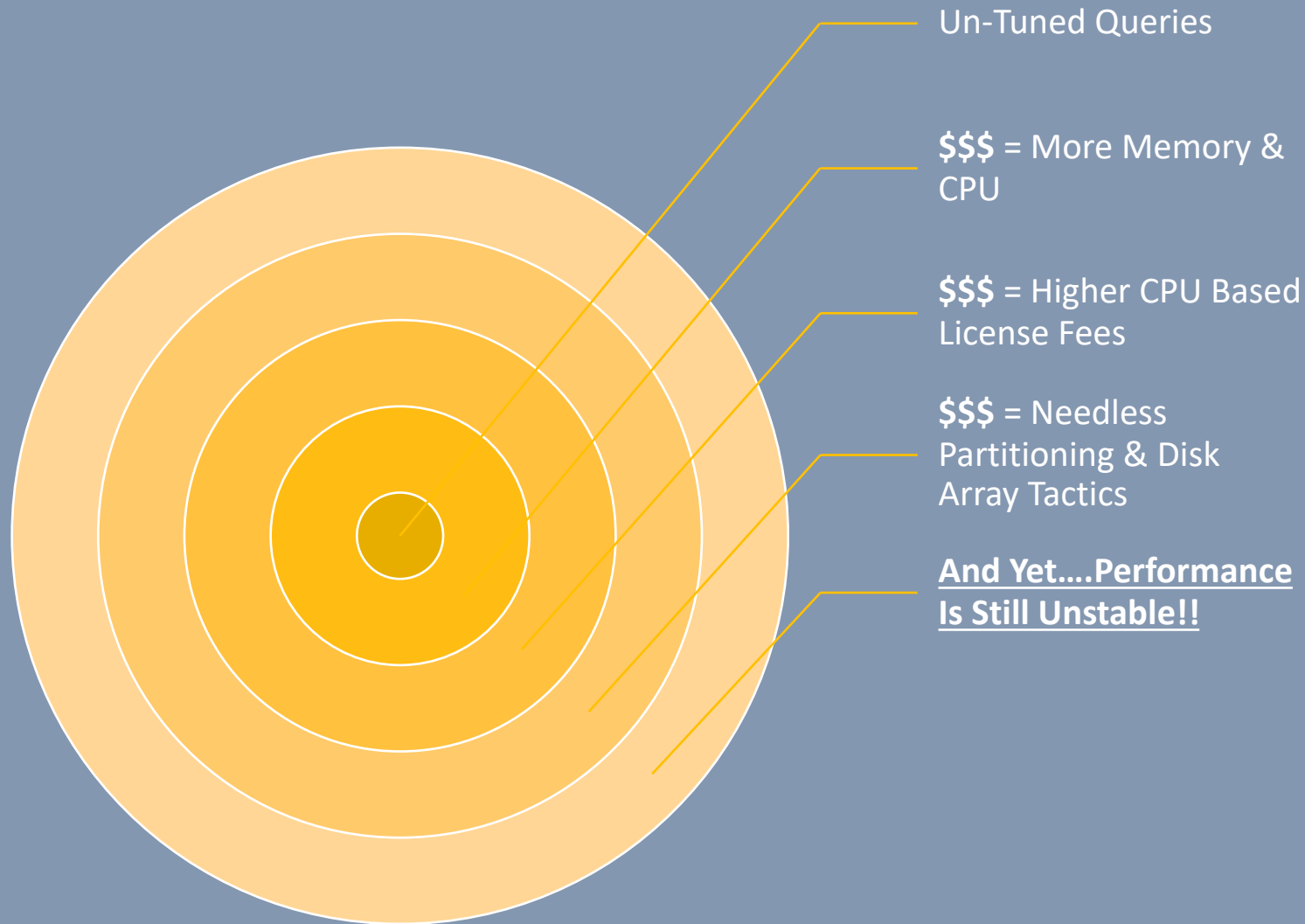
- They “own” the database
- Point finger at developers for query performance issues

## Query Performance

- Does anyone “own” it? Not likely.
- Does true accountability exist? Not likely.



# The Ripple Effect of Poor Query Performance



# DPOP™ Gap Fill

## Customer

CIO, VP or Director in IT. VP or Director can be application development or infrastructure.

- ❑ They want to ensure optimal scalability, stability and performance of their applications and hardware.
- ❑ They want to reduce operational expenses whenever possible, in particular cloud costs.

## Problem

Query performance.

- ❑ This is the most overlooked and misunderstood area of Information Technology and the customer may or may not even know it.
- ❑ It directly impacts everything mentioned to the left.

# DPOP™ Gap Fill

## **External Issues**

Hardware/software/database vendors all selling more of their products to the customer due to bad query performance (the vendors have a vested interest in bad query performance).

- ❑ Furthermore, software vendors will often threaten the customer not to improve the performance of the queries citing "warranty voiding" or "upgrade failing" as bogus reasons.

## **Internal Issues**

Database Administrators on staff usually have a working knowledge of tuning queries, so the customer is confused as to why their own resources can't deal with query performance.

## **Philosophical Issues**

The customer is in the constant cycle of overpaying for hardware/software/database license costs, overpaying for unoptimized payroll and possibly losing business due to slow transaction times.



# DPOP™ Gap Fill

## **Empathy**

DBG Software's "DPOP" (Database Performance Optimization Practice) service understands that query performance is the missing link in optimizing scalability, stability and performance in an IT organization. We have deep roots in Database Administration and have extracted the query performance discipline from that multi faceted job role and made it a life-long professional focus knowing the opportunity cost of not optimally addressing query performance issues.

## **Authority**

DPOP has been utilized in over 300 companies over the past 34 years, with dozens of testimonials from titles at all levels. DPOP is a revolutionary approach to query performance and the proof is in the results on a customer's own system.

# DPOP™ Gap Fill

## Plan - Process

At no charge, we provide a report showing the largest query performance opportunities and an estimate for remediation. DPOP typically starts as a full-time effort and transitions to a maintenance agreement that is financially easy for the customer to renew on an annual basis.

Deliverables include recommendation documents and a metrics tracking spreadsheet. And we ensure our recommendations are implemented with any 3<sup>rd</sup> party software vendors.

## Plan - Agreement

Our Guarantee

- If any query we optimize does not make it at least 2 times more efficient by any of the typical metrics (elapsed time, CPU time, I/O usage), you don't pay.

Our Warranty

- If the query you paid us to optimize no longer provides the 2X improvement within 1 year— assuming no changes, we will come back and tune it again at no extra charge.

# DPOP™ Gap Fill

## **Call To Action - Direct**

If the customer is convinced after seeing the initial report to move forward, then we ask for a contract. The terms vary between 1 – 3 months to start and then are revisited regarding if a maintenance agreement is desired.

Sometimes, a customer doesn't even need the initial report to move forward. They know they have issues and just want to start the service.

## **Call To Action - Transitional**

The initial “bang for buck” report outlines what we can do for the customer, hopefully sparking enough interest to sign on. However, we can also offer at no charge the analysis/remediation of a highly impactful query so they can “test drive” DPOP to see the value before committing.

# DPOP™ Gap Fill

## **Success**

The customer has far faster end user experience elapsed times, much lower hardware usage and it's all stable. Plus, no fears about 3<sup>rd</sup> party software changes.

The customer feels good about the DPOP service and is a referral source for future prospects.

The customer looks good to their own management and will likely use DPOP again, if not immediately sign onto a maintenance agreement.

## **Failure Avoidance**

It's important that the customer knows that by not utilizing DPOP, there will likely be scalability, stability and performance issues.

Not utilizing DPOP means remaining in the costly triangle between hardware/software/database vendors all depending on bad query performance to further their agendas.

Not utilizing DPOP means no relationship to optimize 3<sup>rd</sup> party software and maximize their return on investment.

# DPOP™ Implementation

## Option 1

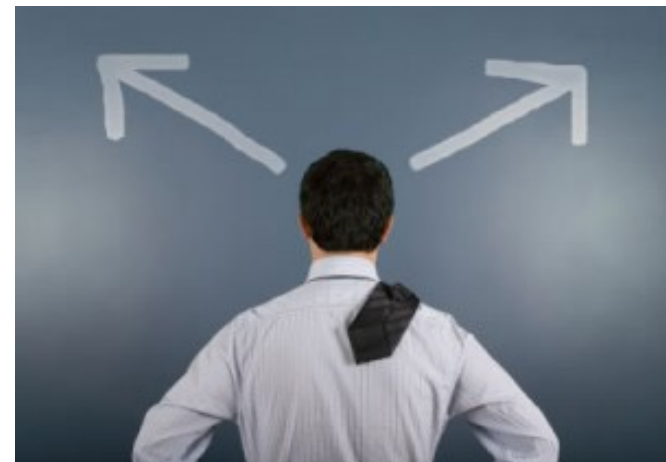
A dedicated team of resources would focus on query performance as their sole responsibility

- Frequent interaction and collaboration with DBA's and developers regarding query performance
- Viewed as a staple for all system development life cycle phases (development, test, production)

## Option 2

DBA and developer responsibilities are significantly enhanced to be accountable for query performance

- Harder to implement due to time constraints of DBA's and developers



# What is DPOP™?

## **Database Performance Optimization Practice**

- A focus on query (SQL) performance

*Queries are 80% of all performance issues*

## **Results are dramatic and immediate**

- Transform end user experience
- Extend hardware life

## **A new and disciplined methodology**

- Appropriate tool selection
- Create a performance “mindset” company-wide



# Typical DPOP™ Impact

- **Increases in revenue & profit**
- **Extended hardware longevity**
- **Reduced costs**
- **Immediate results**
- **Reduced overhead costs**



# DPOP™ Results are Dramatic

## **Slash hardware usage by 80-90%**

- Defers or eliminates hardware purchases

## **Slash runtimes of transactions 80-90%**

- Completely changes end user experience

## **New skill set is mentored**

- All of development has a performance mindset





# DPOP™ Business Value

- **Attracting new customers; loyal customers stay**
- **More revenue at a faster pace**
- **Risk management enhanced**
- **Job satisfaction improved; turnover reduced**
- **Company growth more stable and reliable**
- **Company image is improved and secured**



# DPOP™ Methodology

## Modes

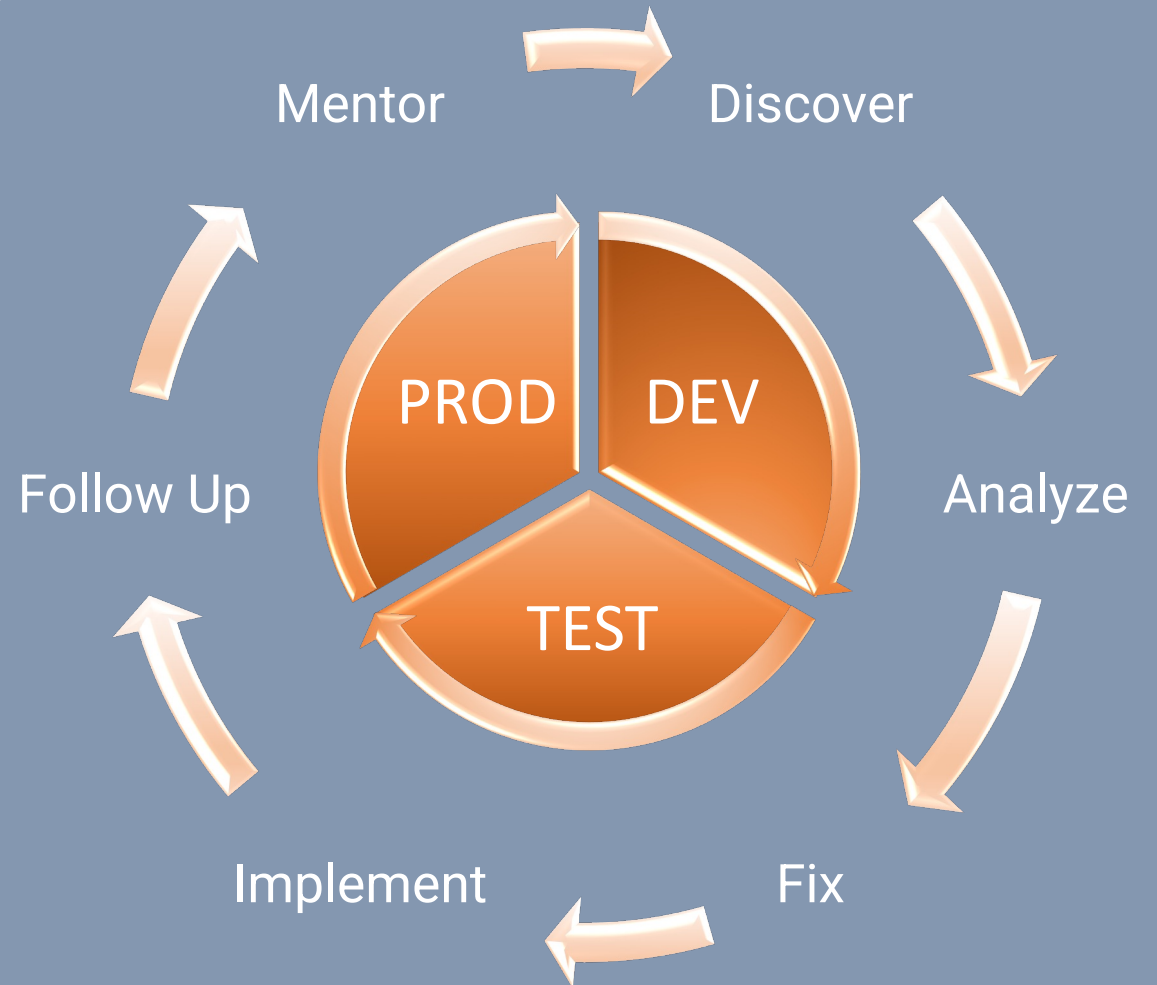
- Proactive/Reactive

## Phases

- Dev-Test-Prod

## Frameworks

- Discover
- Analyze
- Recommend Fix
- Implement
- Follow up
- Mentor



# Modes

## **Proactive**

- Take action before users or hardware feel the impact of poor performance

*Profound return on investment!*

## **Reactive**

- A user is complaining or hardware is being compromised as a result of poor performance

*- A rush to mitigate the problem ASAP!*

*- Disastrous effects on end user perception, hardware resource usage and accurate capacity forecasting*

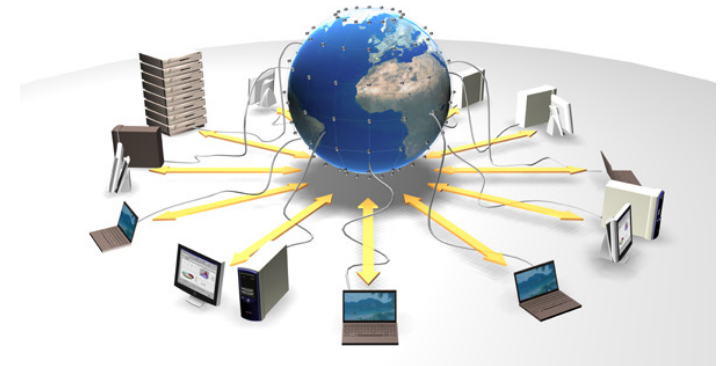
# Phases

## Development

- Query code reviews are not feasible anymore
  - *DBA's & developers too busy*
  - *Hundreds of queries*

## Two databases needed

- Query development
  - *Developers code and design queries*
- Query Analysis
  - *Developers execute queries in "final form"*



# Phases

## **System Test**

- Stress the database
  - *Mimic actual user transaction mix!*
  - *Don't script to artificially slam the database*

## **Identify “Top 10%” functionality**

- No holds barred on tuning mission critical transactions
- Must be tested with every test, regardless of changes



# Phases

## Production

- Stay proactive!
  - *Mine for query performance opportunities*  
Daily, Weekly, Monthly reports

## Trending is key!

- Query performance metrics
- Plan changes

## Define SLA's for query performance

- Establish alerts for SLA breaches (email, page, etc.)
- Follow up on query performance recommendations



# Frameworks

## Query Discovery

- Capture inefficient queries via proper tool
- Prioritize queries in “Overall Analysis Reports”
  - Elapsed time, CPU usage, etc.

## Query Analysis

- Execution plan is the focus
- Create “Analysis” documents
- Create “Performance Recommendation” reports
  - Summarize performance issue
  - Before/after metrics
  - Rationale provided for solutions
- Knowledge transfer and mentoring where appropriate



# Frameworks

## Query Analysis

- Format the query
- In prod and test

*Gather statistics on query objects (tables/indexes)*

*Gather indexing structures*

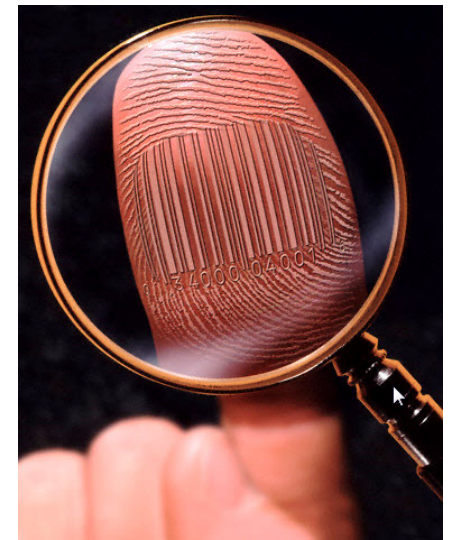
*Get values test for bind variables to test query*

*Capture original execution plan (resolve differences)*

*Capture original metrics*

## Tune Query

- Save “Analysis” document
- Create “Performance Recommendation” report





# Success Factors

- **Proper tool selection critical**
  - All phases and modes
- **Focus on best query plan, not times**
- **Track recommendations and follow up**
- **Keep analysis and recommendation docs**
- **Create/maintain database dedicated to tuning**



# Case Study: Major Rental Car Company

- Airport locations ranked #1 by JD Power in first year during 1990's and every year since
- Over 8,000 rental branches globally converted to new technology after 3 failed previous attempts without DPOP. Average customer transaction time (end-to-end) cut by 95%
- B2B insurance replacement yields consistent revenue growth from new contracts and optimized existing contracts
- Market research for rental branch construction enhanced
- Website portal traffic increased over 60%, increasing revenue
- Vehicle Acquisition and Car Sales optimized to maximize profit

# **Case Study:** Major Rental Car Company

## **Branch Technology Solutions—a closer look**

- Over 8,000 branches world-wide had waited almost 10 years, with 3 previous attempts at rollout failing due to performance issues.
- DPOP provided solutions within 1 month that allowed for complete rollout globally.
- DPOP brought a completely new perspective to resolving the performance issues
- As a result, this company created a department called “Application Performance” using DPOP methodologies

# Case Study: Major Rental Car Company

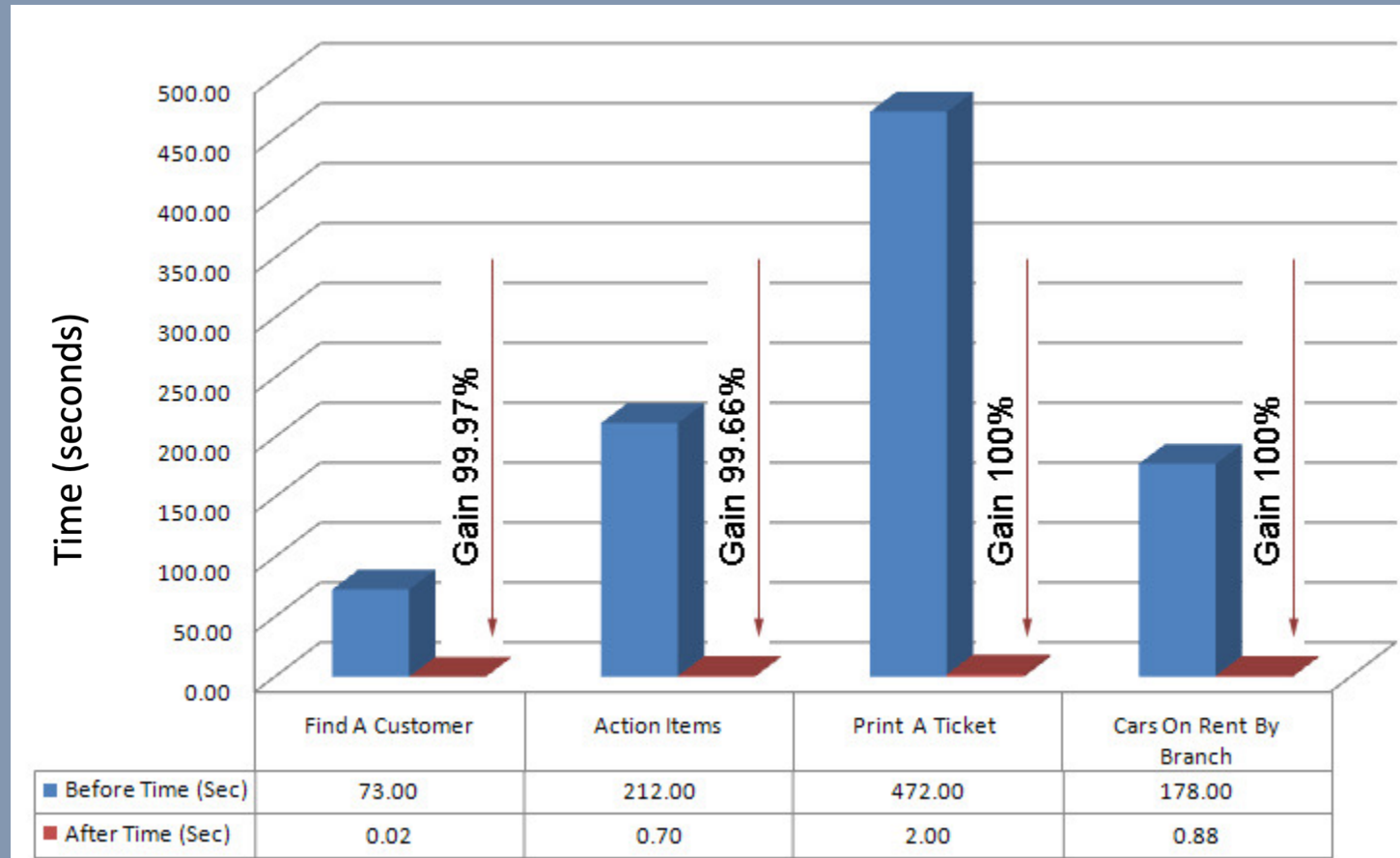
## Branch Technology Solutions—a closer look

- Performance tactics included:
  - *Indexing*
  - *SQL Changes*
  - *SQL Hints*
  - *Histograms*
  - *Stored Outlines*
  - *Materialized Views*
- Successful mentoring to a team of 10 DBA's and over 250 developers
- Helped establish selection of proper tools for monitoring databases and defining a benchmarking process

# Case Study: Major Rental Car Company

- **DPOP manager, Curt Triplett, provided all analysis and resolutions**
- **Executives from across the company have recognized Curt's work as a result**
  - *"Curt was responsible for the tuning of our major application used by over 40,000 users in our rental branches. He was instrumental in the evaluation of performance issues at the database layer and provided recommendations for improved SQL as well as Oracle configurations which allowed us to both improve performance and reduce the need for CPU and memory at the database tier."*
  - *"Curt has the unique ability to completely transform any sub-optimized business application/database and systematically apply his skills to improve the performance – consistently"*
  - *"I am convinced Curt was able to save us millions of dollars on hardware upgrades. IBM has had a distinction for years known as gold consultants. In my mind, Curt is the gold consultant."*

# DPOP™ Business Value Examples



# **Case Study:** Major Credit Card Company

**A fraud detection process alerts credit card holders in 20 seconds of fraudulent activity, instead of 3.5 hours.**

Over the course of 2 years, this customer sought performance relief from multiple sources

The authoring software vendor

Oracle Consulting

Various performance consultants

- DPOP brought a fresh perspective to the performance issues and in a matter of hours (less than 1 day), the fraud alert time was cut from 3.5 hours down to 20 seconds
- This major credit card processing company considering a Rose partnership for a global impact of DPOP on fraud detection

# **Case Study:** Major Credit Card Company

## **Fraud detection solution—a closer look**

Performance tactics included:

Indexing

SQL Changes

SQL Hints

Histograms

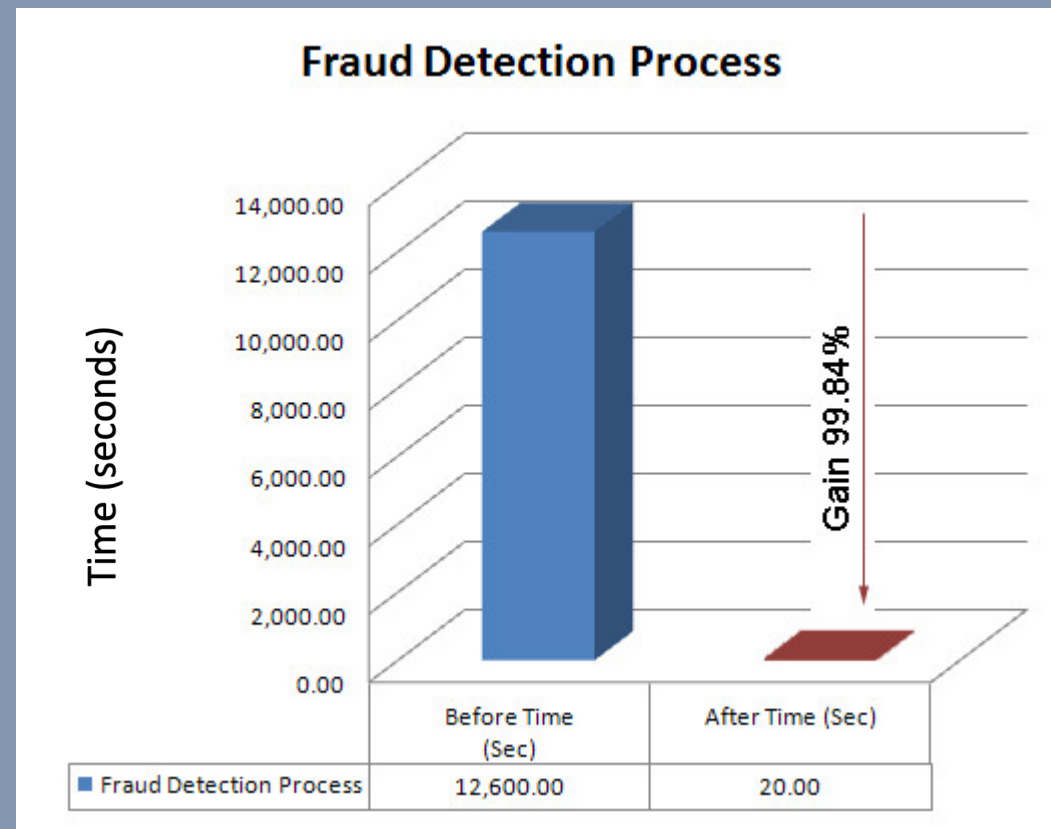
Stored Outlines

Materialized Views

- Successful mentoring to a team of DBA's. These DBA's reported later that the DPOP tuning methodologies shown to them were used ongoing with similar results
- DPOP helped establish selection of proper tools for monitoring databases



# DPOP™ Business Value Examples



# **Case Study:** Major Credit Card Company

- **DPOP manager, Curt Triplett, provided all analysis and resolutions**
- **Executives from across the company have recognized Curt's work as a result**

*"I would like to say thank you for the support you were able to provide us on our Oracle and SQL platforms. We have seen great benefit from your services especially on the Oracle side where job run time for our EMS application was drastically reduced without the need to alter the application. Also your flexibility with being able to work remotely was a great benefit for us. It not only helped to reduce cost it also decreased response time and helped by resolving issues in a more timely manner. We look forward to continuing to work with DBG Software in the future."*



## Database Performance Optimization Practice (DPOPT™)

Thank you!

For further information, please visit [www.dbgtools.com](http://www.dbgtools.com)