

usage MANAGEMENT BI/DW
a white paper



Usage Management for Business Intelligence/Data Warehouse Environments

Improving Performance, Compliance and Cost Savings

Challenges of Managing Business Intelligence and Data Warehouse Environments

Data warehousing (DW) environments, business intelligence (BI) and other user-driven analytical applications are dynamic, resource intensive and unpredictable. Powerful BI tools, along with Excel and many other available SQL access tools allow business users the freedom to create their own “application” or analysis on-the-fly, responding to changing business demands, new reporting requirements, and updated information. System use in these dynamic environments is subject to inappropriate user behavior, rogue applications, and malformed queries that can slow overall application performance, generate incorrect results, violate compliance or security policies and waste system resources. These user generated problems reduce business performance while increasing support and system costs and business user frustration.

A Different Management Approach is Required

Database monitoring solutions are designed for DBAs to optimize the database system and manage database system processes. However, they were not designed to address dynamic, user-driven application challenges in data warehouses where new, unanticipated queries are generated every day. Many BI vendors provide monitoring components with their specific tools. These provide little or no understanding of what is going on with other applications or the database in the overall data warehouse environment. A complementary but different approach is required to properly address the unique user, application, query and database usage challenges of BI/DW environments.

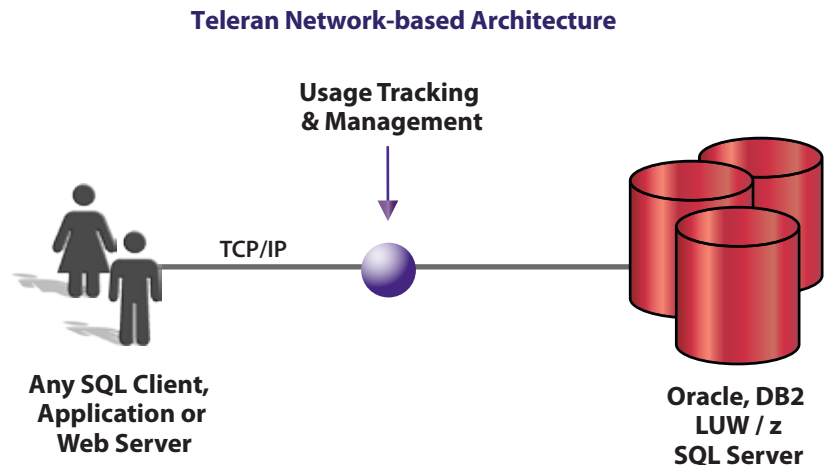
Teleran Application Usage Tracking and Management

Teleran, a leader in application usage management software, delivers a patented product suite that provides comprehensive awareness and control of user behavior, application activity, and database usage. Teleran’s automated tracking, analysis and real-time user management capabilities enable IT to improve performance and manageability across all BI applications while reducing support and system costs.

Teleran’s software product suite includes:

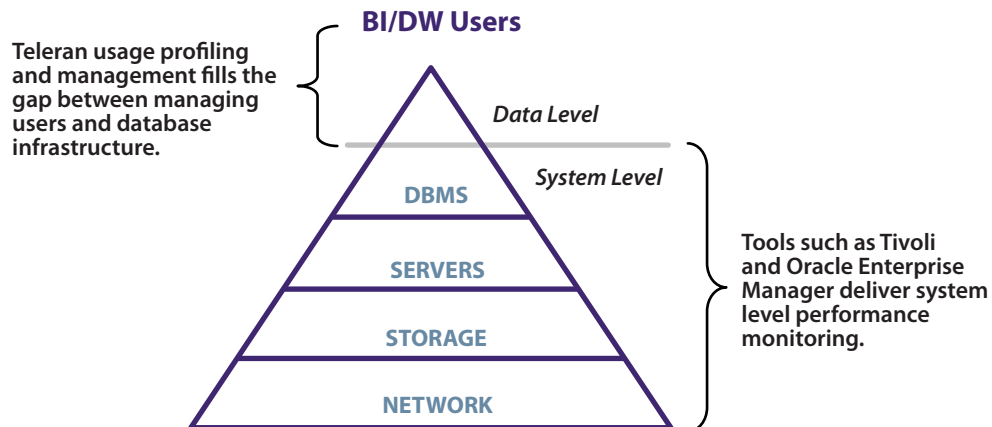
- **iSight™** continuously captures usage activity, providing a “top down” perspective of business user behavior and application and data usage trends over time. iSight captures granular usage information across key dimensions of the application environment: named business users and their organizational context, application activity, SQL query and data usage, as well as performance, errors and result set metrics.
- **iSight Analytics** is an analytic application that delivers comprehensive visibility and insight into business intelligence application and data warehouse activity. It transforms the data captured by iSight into actionable BI/DW management information.
- **iGuard™** is a real-time usage policy action engine that prevents inappropriate, mal-formed, unauthorized or rogue queries from reaching the database and degrading performance, returning incorrect answers, breaching data security / compliance policies or wasting system resources. It protects corporate data while optimizing business use of information. iGuard Messaging acts like an automated helpdesk, guiding and training BI/DW users with real-time messages when they attempt to violate an active iGuard policy. iGuard messaging improves user productivity while reducing helpdesk calls and support costs.

Teleran’s network-based architecture enables Teleran’s solution to operate transparently and continuously on the network without degrading database or application performance. Unlike “snapshot” system and database performance monitors, Teleran’s iSight requires no resource-consuming “in the database” agents, traces or monitors or programming changes to applications.



Closing Gap Between Managing BI/DW Business Use and Monitoring System Level Resources

Teleran's software products fill a gap that system level database and performance monitors do not address: tracking and managing how users are interacting with both the application and database layers. With Teleran, organizations can "holistically" manage the entire BI/DW environment to get the greatest value from their investments in people, information and systems.



Key Teleran Usage Management Benefits

- Provides visibility on how the business is using and valuing BI applications and data
- Improves performance and efficiency by preventing inefficient user behavior
- Reduces operating risks by identifying and preventing inappropriate use
- Minimizes support costs and effort by automating user guidance and control
- Ensures compliance with real-time usage auditing and data access controls
- Helps target and justify IT investments by tracking business use of applications and infrastructure
- Reduces costs and risks of consolidations by analyzing existing usage and data models
- Delivers immediate value with quick installation and minimal administration

Companies Generate Measurable Savings with Teleran

- **Reduced server and storage costs by over \$1M in 12 months**
 - Prevented resource wasting system use
 - Reduced database storage by identifying unused data which the company deleted
- **Decreased shipping and inventory costs by \$1.8M within one year**
 - Improved sales system availability by 90 minutes each day by eliminating dormant data and reducing the load time window
 - This enabled sales staff to resell return products before having to ship goods back to the warehouse
- **Saved \$800,000 in compliance costs**
 - Company licensed Teleran products for performance management
 - After budgeting \$800,000 for PCI compliance project, company determined that Teleran's solution also fulfilled their compliance requirements
- **Reduced \$260,000 in software licensing and maintenance costs**
 - Company used Teleran iSight to identify unused BI software application licenses
 - Unused licenses were re-deployed to another business unit which had budgeted \$260,000 to purchase additional licenses

Teleran BI/DW Usage Management Capabilities and Case Studies

What follows are more detailed Teleran product descriptions and customer case studies.

iSight - Network-based Usage Tracking

Revealing the How Users Interact with BI Applications and Data

Teleran's iSight Usage Tracking continuously captures usage activity, providing a "top down" perspective of business user behavior and application and data usage trends over time. iSight captures usage information across key dimensions of the application environment: named business users and their organizational context, application activity, and data usage, as well as performance, errors and result set metrics. Because iSight focuses on users and applications, it highlights problems in the overall environment not visible via database-only oriented utilities or application specific monitors. iSight employs network-based usage capture methods that do not put any overhead on the database or introduce transaction latency.

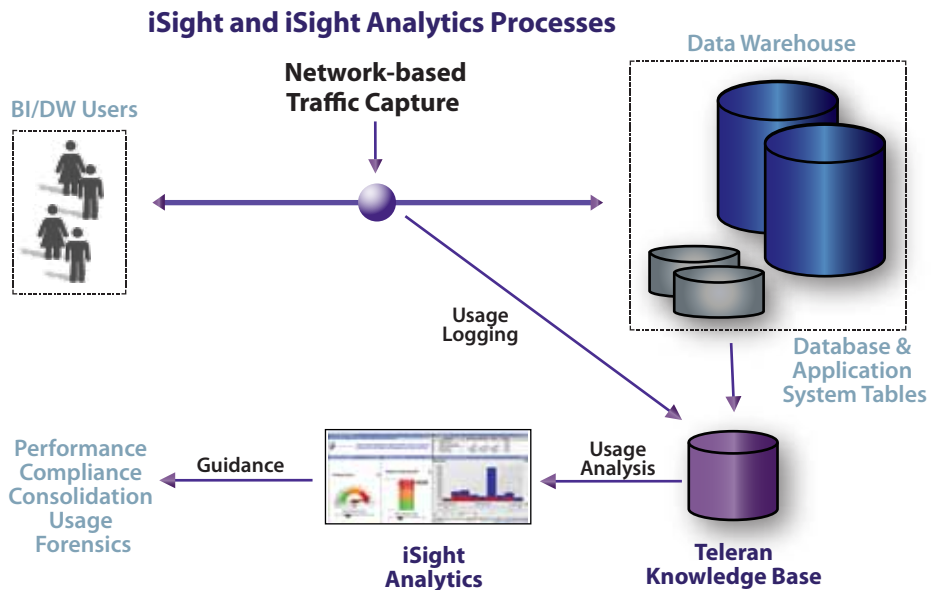
Ensuring Actual Users and Their Business Context are Identified

iSight's Identity Persistence™ and Business Context™ features associate the named business user and his or her specific business context (ex. business unit, location, department, and role) with the actual query that gets processed by the database. Most applications log into the database with a generic or proxy ID, masking the business user identity to any database monitoring facility. Teleran's Identity Persistence ensures that the user's identity is not lost as the transaction is processed at the database. This enables Teleran's products to both monitor and manage users and transactions based on who the named business user actually is and their place in the business organization. Connecting the application user and his or her business context to application data usage is a critical element to addressing performance, compliance and resource management issues and ensuring that business needs are understood and met by IT.



Logging and Analysis of Usage Data

iSight automatically creates, configures, and maintains its usage database or Knowledge Base. At installation and then periodically, iSight models the system catalogue tables of the database(s) and applications to which it is profiling access. This enables iSight (as well as other Teleran products) to maintain a current understanding of users, applications and database objects, and their relationships including tables, columns, views, joins, indexes, stored procedures, and others.



iSight Analytics – Comprehensive BI/DW Usage Analysis and Reporting *Delivering BI/DW Management Insight*

iSight Analytics is a usage analysis application that delivers comprehensive visibility and insight into application and data warehouse activity. It transforms the granular usage data captured by iSight auditing into actionable information. iSight Analytics analyzes activity across key dimensions of the BI/DW environment: users, applications, SQL, and database usage and performance. Using a fast and intuitive in-memory business intelligence interface, iSight Analytics facilitates decision-making with four solution modules that address key BI/DW management areas:

- Performance
- Compliance
- Usage and Dormancy
- Database and Application Consolidation

iSight Analytics brings a holistic visibility of BI/DW usage within a business context by associating user, application and data usage activity with specific business units, geographies, roles and other organizational attributes. This enables BI/DW management to see the big picture and ensure that all BI/DW resources are aligned to address the business needs and deliver the highest ROI to the business. iSight Analytics supports IT change management and process improvement resulting in improved operational efficiencies and cost reduction.

Key iSight Analytics Capabilities

- Fast tabular and graphical reporting and analytics using embedded in-memory BI technology
- Dashboards with key performance indicators (KPIs) for both IT and business stakeholders
- High level exception reporting, drill to detail, and alerts enable quick diagnosis and problem resolution
- Easy-to-use, intuitive BI interface enables ad hoc analysis and reporting

iSight Analytics Solutions

What follows are more detailed descriptions of the iSight Analytics solution modules.

iSight Analytics Performance Solution

Managing a BI/DW environment is a complex undertaking. Meeting agreed upon SLAs is an even more daunting task, especially if you lack holistic visibility across the entire BI/DW ecosystem. The iSight Analytics Performance Solution delivers the needed visibility and insight into the most complex BI/DW environments, allowing you to quickly isolate problems, and drill down into the detail for root cause analysis and remediation.

Key Benefits

- Identifies and resolves performance problems by analyzing usage activity across the BI/DW environment: users, applications, SQL statements, and database objects
- Delivers top down dashboards, exception reporting and analysis
- Ensures business objectives are met by providing both business and IT views of BI/DW performance

iSight Analytics Performance starts with a management-level dashboard that highlights overall performance indicators compared to SLA baselines and thresholds.

To address performance inhibitors, iSight Analytics Performance immediately pinpoints poorly performing activities and anomalies, whether they are caused by applications, database errors, queries, or ETL.

Importantly, iSight Analytics Performance brings a business context to BI/DW performance management by correlating user, application and data usage with your organization's business context. This enables IT staff to identify and address performance issues by user, role, department, line of business and location, ensuring that each business unit's objectives are met.

iSight Analytics Performance Dashboard



iSight Analytics Compliance Solution

Today, more than ever, organizations must protect their information assets. Both external compliance regulations such as PCI and SOX and internal governance requirements mandate that companies ensure their data is appropriately used and protected. iSight Analytics Compliance Solution cost effectively delivers a comprehensive compliance monitoring, analysis and reporting facility for BI/DW environments.

Key Benefits

- Ensures data is used appropriately by providing analysis on who is accessing what sensitive data with what application and when
- Reduces risk by identifying and alerting management to suspicious activities and anomalies, ensuring immediate and appropriate responses
- Delivers audit reports that address key regulatory and governance reporting requirements and lowers the risk and cost of audits

iSight Analytics Compliance monitors access to sensitive data residing in tables and columns across key dimensions: user, application, SQL statements, data model, and time. It also tracks data manipulation (DML) activity including inserts, updates, deletes, and database activities such as granting permissions, and adding and deleting tables.

iSight Analytics Compliance Report - Sensitive Column Access



iGuard enables the information management or the compliance team to define and enforce real-time data protection policies that prevent access to sensitive data.

iSight Analytics Compliance alerts and reports on attempted breaches of iGuard compliance and governance policies or other defined events. Alerts are delivered via a wide range of media including email, pager, and SMS text messaging.

iSight Analytics Usage and Dormancy

Data storage and retention requirements grow an estimated 75 to 100 percent annually in most large enterprises. The cost of data growth is not just in storage hardware, but also in the escalating processing costs associated with complex querying of ever-larger data sets, and the data handling costs related to database administration and ETL processes. iSight Analytics Usage and Dormancy solution enables organizations to develop and execute a cost effective storage management strategy to reduce costs and to ensure the required data warehouse query and data loading performance and efficiency.

iSight Analytics Usage identifies which database objects are frequently accessed or rarely accessed in order to develop the most cost effective information life cycle strategy for Tier 1 through Archival storage levels.

iSight Analytics Usage delivers insight that can accelerate retiring an application months or even years ahead of schedule, saving both storage, personnel and licensing costs.

iSight Analytics Usage and Dormancy Dashboard



Key Benefits

- Identifies usage patterns that guide information lifecycle management strategy to determine the most cost effective data storage
- Guides deletion or archiving of unused or little used data, reducing storage and processing costs
- Speeds query and ETL performance while reducing data handling and support costs
- Highlights unused, but potentially valuable data to the business users

iSight Analytics Database and Application Consolidation Solution

Whether due to mergers and acquisitions or business units resisting migration to a corporate standard, applications and databases have proliferated across companies. IT organizations recognize database and application consolidations are a means of significantly reducing IT costs and management complexity. iSight Analytics Consolidation Solution delivers unique insight into how applications and databases are used in the legacy environments in order to: identify what applications and databases should be consolidated, develop the best performing and most cost efficient combined data models, and guide capacity planning in the new environment.

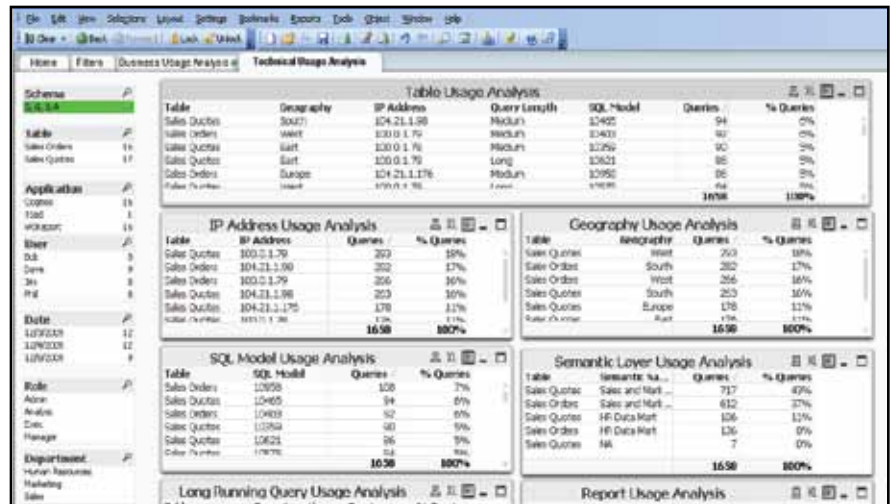
Key Benefits

- Speeds consolidation time to market while reducing overall project costs, risks and effort
- Captures baseline application and data usage metrics to guide consolidation projects
- Guides projection of system resources required by analyzing resource demands of BI/DW and mixed work-load systems in the legacy environments
- Ensures consolidated environments meet the needs of business and result in lower costs

iSight Analytics Consolidation provides data usage information down to the column level as well as identifying query patterns, including summarization, grouping and join patterns that provide critical input into designing optimal consolidated database models.

iSight Analytics also baselines database workload characteristics that provide critical input into projecting system capacity requirements in the consolidated environment.

Sample iSight Analytics Consolidation Analysis



iSight Analytics Cost-Effectively Delivers Value to Both IT and Business

iSight Analytics provides essential, easily distributable BI management information for key organizational roles including IT management, data warehouse directors, analysts, business unit managers, architects, application managers, BI liaisons, business analysts, compliance staff and DBAs. Here is how iSight and iSight Analytics are used and valued by roles in one of the world's leading financial services firms:

- **Information Management / Data Warehouse Directors**
Information Management / Data Warehouse Directors receive summarized performance, resource use, and exception reports that guide the allocation and management of system and staff resources as well as assist in budgeting and capacity planning.
- **Business Unit Managers**
Business unit managers use iSight Analytics to identify what information their staff uses and values and to confirm what applications are actually being used as intended. Business managers also receive charge back reports that calculate charges based on actual use.
- **Architects**
Both data warehouse and system architects use iSight Analytics reports to gain comprehensive view of how the overall BI/data warehouse environment is operating. With this information they can identify potential architectural problems, resource constraints and project future capacity requirements.
- **BI Liaisons / Business Analysts**
BI liaisons and business analysts in each business department receive usage profiling and user error reports to ensure that applications are being used effectively and to identify where user assistance or training may be required.
- **Compliance Staff**
Compliance staff uses iSight and iSight Analytics to monitor adherence to compliance policies and to meet audit and reporting requirements.
- **DBAs**
DBAs use iSight Analytics to identify and resolve performance associated with particular application queries or reports and users. These reports give DBAs actionable detail to maintain application performance and quality, and to identify when and where to use system-level database monitoring and administration tools.

iGuard - Automated Query and User Controls

Protecting Systems from Inappropriate, Resource Wasting Transactions

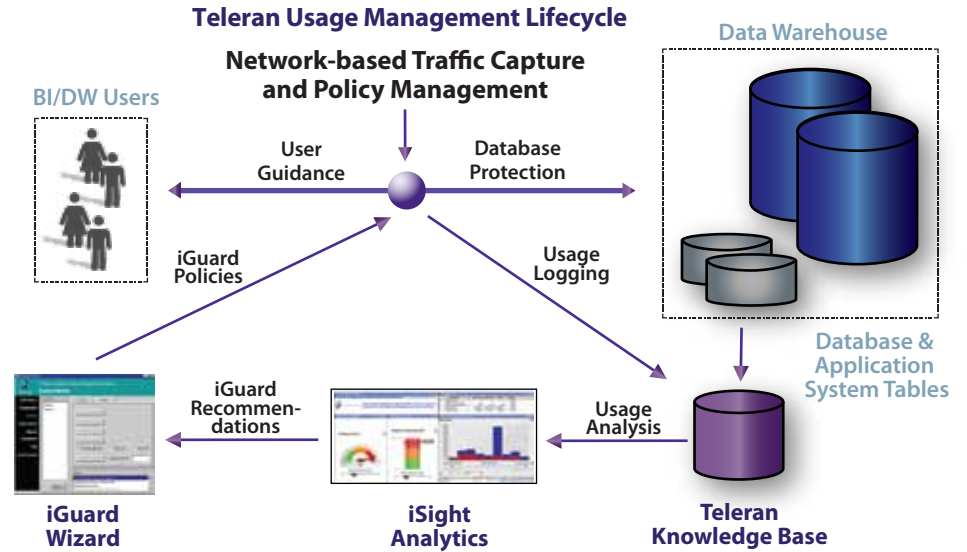
No matter how much planning and support goes into BI/DW and other dynamic application environments, end-users unknowingly and inevitably issue inappropriate or "runaway" queries that degrade performance, deliver inaccurate results, or breach data privacy policies. iSight Analytics reports identify these user/query problems and direct the application of iGuard query control policies and user messages.

iGuard usage policies prevent inappropriate, mal-formed, unauthorized or rogue queries from reaching the database and impacting SLAs, returning incorrect answers, violating data security and compliance policies or wasting system resources. iGuard operates in conjunction with iSight on the network. It automatically applies selected query control and user management policies via its patented high speed policy action engine. This highly efficient, small memory foot-print, patented process is designed to evaluate queries in milliseconds, introducing no material latency, while protecting the system from performance degrading, inappropriate queries.

Key iGuard Benefits

- Improves business performance and productivity
- Minimizes costs by improving system resource efficiency
- Reduces help desk calls and facilitates end-user self-service
- Lowers the cost and effort of supporting growing numbers of users
- Protects data for compliance and security

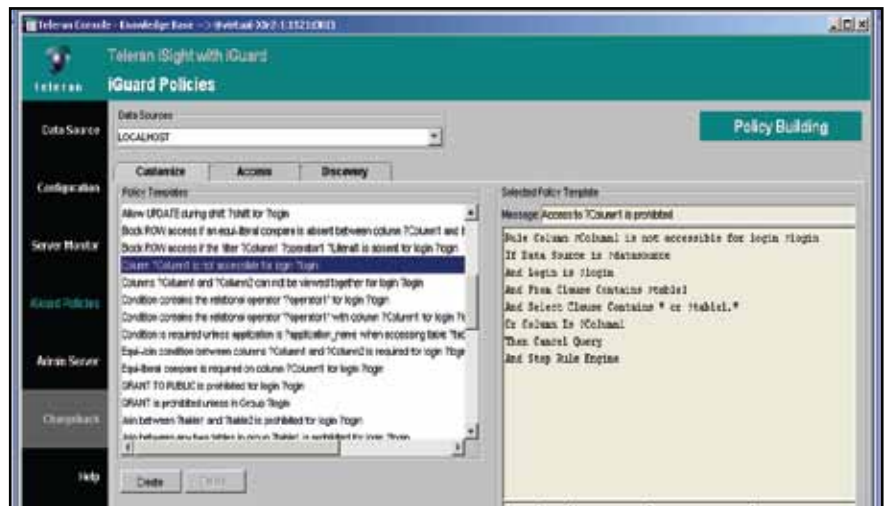
iGuard identifies queries that violate active policies and stops those queries before they reach the database. At the same time, iGuard instantaneously sends a customizable message to the application user that guides them on ways to improve the efficiency and effectiveness of their query. Those queries that do not violate a policy pass through to the database for processing. iGuard policies in conjunction with user messages dynamically "tune" users, improving their productivity while minimizing help desk calls and IT support costs.



Improves Query Performance, IT Productivity and System Efficiency

Based on a patented real-time policy action engine, iGuard provides over 60 customizable usage policies that are applied with an easy-to-use policy wizard. Policies are selected from the iGuard policy library and tailored to address specific query issues associated with users, user groups, applications, and database objects or groups of objects. Because iGuard policies are informed by user, application as well as database contexts, they provide unique controls, not available with database optimization and workload management solutions

iGuard Policy Wizard



iGuard protects the database from the common user errors, compliance problems and inefficient querying behavior that slow application performance and consume IT staff time with repetitive, manual troubleshooting and problem resolution. Here are several iGuard policy examples: →

Delivers Control and Flexibility with Test and Active Policy Modes

iGuard policies can be placed in Test or Active modes. In Test or "simulation" mode policies do not prevent queries, but the system records and reports on what queries would have been acted upon and how these policies can improve performance, accuracy, or security when activated. Active mode allows policies to prevent queries when violated and simultaneously send iGuard messages to users.

- Do not do a SELECT from the claims table without REGION code. (Improves resource efficiency)
- Do not allow specified users or user groups access to specified tables, columns and rows. (Enforces data level privacy and compliance policies)
- Do not permit a join between TABLE A and TABLE B without column A. (Requires joining to an indexed column to improve performance and resource efficiency)
- Do not join a fact table to itself. (Prevents "runaway" queries from wasting system resources and reducing user productivity)
- During the day shift, do not permit unqualified access to TABLE A and TABLE B, but permit access during the evening and night shifts. (Maintains peak period performance by deferring long-running queries to off-peak times)
- Do not allow a SELECT * from a fact table without a WHERE clause. (Prevents unconstrained queries from consuming significant system resources)
- Do not join two fact tables to each other without qualifiers. (Prevents nonsensical results)
- Do not join TABLES A and B. (Prevents a many-to-one-to-many join that generates misleading results)

iGuard Messaging - Real-time User Guidance

Trains Users, Improves Performance, and Reduces IT Support Costs

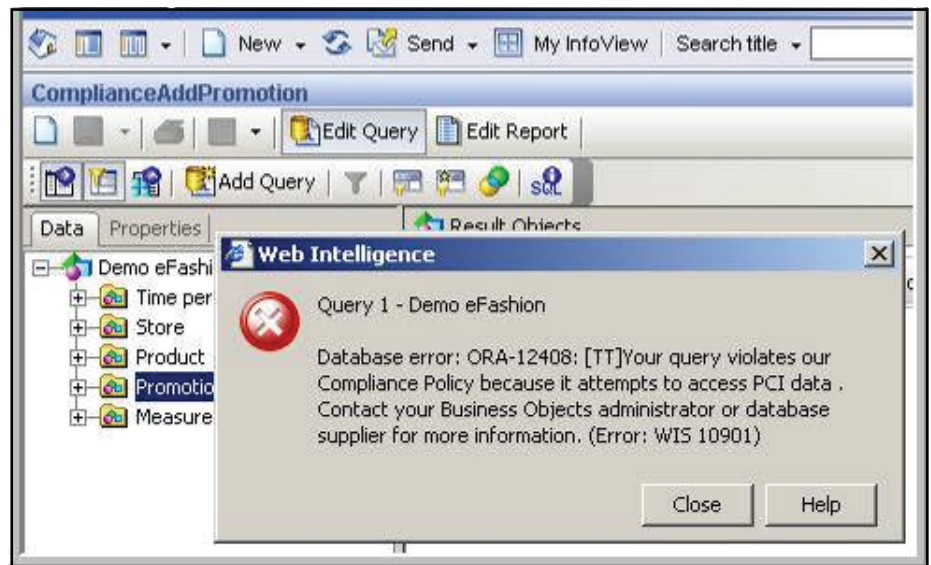
iGuard Messaging addresses common BI user problems that drive up support demands and reduce productivity. Using real-time customizable text messages, iGuard messaging works in conjunction with iGuard policies and guides users to more effectively and efficiently access and interact with data and applications. Whenever an iGuard policy is triggered by an inappropriate query, an iGuard message is instantaneously sent to the user, independent of the application used, suggesting how he or she can adjust or improve their query.

Improves How Users Interact with Applications and Data

iGuard Messaging has proven to increase the quality of user interaction with information. Users appreciate the real-time guidance delivered by iGuard messages.

It assists them in getting faster more accurate answers, reduces their frustration, and improves their overall productivity. For IT staff, iGuard Messaging minimizes the time helpdesk and DBA staff spend dealing with common and recurring end-user query problems, directly reducing helpdesk, training, and IT support costs.

iGuard Message Delivered to BusinessObjects User



The following are example messages associated with iGuard policies.

Performance

"This query will run for more than 3 hours. Please further constrain your query or schedule it to run overnight using the query scheduler."

User Guidance

"Joining these tables will produce a very large result set. Add a 'where' clause and try again."

Priority Schedule

"Only the Finance staff can access P&L tables at quarter-end, 9:00 to 11:00 a.m."

Maintenance

"The Inventory Table is being updated right now. Run your query after 1:00 p.m."

Query Accuracy

"Joining Sales and Sales Returns data will produce incorrect results. Try again using Sales and Sales Order tables."

Query Alerts

"A data security policy has been activated two times by the same user. Look at today's security audit report for more details."

User Notification

"The Sales application has new customer information. Call the Help Desk to schedule training."

Data Security

"You are not authorized to access salary data."

Teleran Customer Case Studies

The following Teleran customer case studies describe the benefits organizations have gotten from licensing and deploying Teleran software products. Teleran's unique combination of performance improvement, protection, and operational cost savings delivers measurable savings and material business benefits.

GE Money



GE Money

GE Money's 60 terabyte consumer credit card data warehouse was incurring database performance problems, violating customer service level agreements and impairing productivity of 600 credit analysts world-wide. In addition they needed to ensure that they were in compliance with the Payment Card Industry (PCI) Data Security Standard that required auditing and securing the use of personal financial data.

GE licensed Teleran iSight and iGuard to address both their database performance and compliance issues. GE deployed iGuard policies to better control resource wasting SAS queries and unpredictable ad hoc SAP BusinessObjects analyses. iSight auditing was used to tune the database model based on actual application usage patterns. In addition, iSight ensured that BusinessObjects Universes were synchronized with ongoing changes at the database. With Teleran, GE data warehouse performance improved by 45%, enabling GE to meet service levels required by internal and external customers. GE met their PCI audit and control requirements with iSight and iGuard and saved over \$800,000 in compliance costs that they would have incurred developing an in-house solution as they had originally planned.

"At GE Money Teleran products enabled the company to increase system capacity by 25%, improve performance by 45% and satisfy PCI compliance demands. As a result, GE Money is planning on rolling out Teleran products enterprise-wide. Teleran provided GE Money several advantages over competitive products in the market. These included:

- *Supporting multiple database technologies on multiple server platforms, enabling enterprise deployment*
- *Capturing more data about the users, queries, applications, databases*
- *Offering active usage policy management*
- *Providing a non-intrusive architecture that did not consume database system resources*
- *Delivering integrated analytics and reporting, requiring no report development"*

William Klancko
IT Leader
GE Corporate



MAYO CLINIC

Mayo Clinic:

In 2007 Mayo Clinic determined that they needed a system that enabled them to comply with the federally mandated Patient Health Information (PHI) Act and the Health Insurance Portability and Accountability Act (HIPAA) for an application that would be used by over 2000 physicians. These privacy regulations required that access to patient information be audited and explicitly controlled. After reviewing compliance solutions in the market, Mayo Clinic selected Teleran to implement their data privacy solution.

The Teleran system provided auditing and access query controls that enabled them to protect sensitive patient data. It also delivered operational efficiencies that reduced their costs and improved system performance. Mayo Clinic has stated that they intend to extend Teleran use to other Mayo applications throughout their system of clinics.

"Teleran is the only vendor that provided us with a common security enforcement and auditing framework across all data retrieval applications and databases. The reasons we chose Teleran were that it delivered:

- *Detailed security at database row and column level*
- *Data masking for sensitive patient health information*
- *Individual user tracking independent of the applications used*
- *Both compliance and operational efficiencies"*

Tom Fisk
Security Director
Mayo Clinic

Conclusion

BI/DW, analytical and other dynamic application environments are subject to unpredictable query patterns, changing user demands, and the inevitable user-created query problems that degrade performance, diminish productivity, and compromise compliance and security policies. Regardless of how much planning goes into these applications, user requirements change, databases grow, maintenance windows expand, user errors occur, and query volumes increase. The challenge: how to continuously manage the performance, user satisfaction, and value of this dynamic use while minimizing support staff, maintenance, and system resource costs. Teleran's objective is to help organizations meet these challenges with products that deliver essential BI and data warehouse management disciplines.

Teleran's software products provide comprehensive awareness and management of user behavior, application activity, and database usage. They uniquely complement system level, database and application specific monitors, bridging the gap between understanding and managing users and managing underlying database and system resources. With Teleran, organizations can now cost-effectively manage their entire BI/DW and analytical application environments to get the greatest value from their investments in people, information, and infrastructure.

Teleran Technologies is the leading provider of software for ensuring the performance, compliance, and cost efficiency of user-driven, dynamic application environments. These include business intelligence (BI) data warehouses, CRM, Web-based and cloud applications. Through end-to-end knowledge of the application environment - users, queries, applications and databases - Teleran software aligns IT processes with business needs, improving compliance, reducing costs and enhancing business performance and productivity.

Founded in 1996, Teleran pioneered the concept of usage monitoring and management for data warehouses and analytic applications with its patented "policy action engine" and management process. Today the company provides solutions for many of the world's leading companies, including Allstate, Bristol-Myers Squibb, GE, Mayo Clinic, Merrill Lynch, MetLife, Pixar, US Army, Vanguard and Wells Fargo.

Teleran Technologies, Inc.
333A Route 46 West
Fairfield, NJ 07004
www.teleran.com