

dynamic APPLICATION MANAGEMENT
a white paper



The Difference Between Success and Failure is Intelligence

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Prepared by

**Dr. Claudia Imhoff
Intelligent Solutions, Inc.**

The Evolution of Business Intelligence

Business intelligence (BI) has gone through a number of changes in its evolution to its current state. These can be divided into three stages – **First Stage**: the ability to gather, integrate, and store data; **Second Stage**: the ability to analyze and report on the stored data; and the **Third Stage**: the ability to act on the intelligence generated from the environment. Let's look at these in more detail and then compare BI's beginnings to a similar evolution - that of dynamic application management (DAM) of the BI environment.

First Stage - the ability to gather, integrate, and store data. BI started with very simple beginnings - it started when companies realized that they needed access to the wealth of data locked up in their operational systems. Once they were able to access the data, they soon realized that it had to be integrated to be of any use. This realization started a major technological industry - extraction, transformation, and loading (ETL). Once the data was integrated, it had to be stored in an accessible format and appropriate technology. Again the vendor community stepped up to the plate with innovation and renovated databases. Major hardware and software companies have focused significant time and energy to change storage technologies to support the massive amount of data needed for BI. In addition, standards for accessing the data had to be developed to simplify the ability of business users to finally "get at" their data.

Second Stage – the ability to analyze and report on the integrated, stored data. In the past 15 years, the BI world has seen nothing short of a revolution in terms of the innovative and sophisticated technologies created to analyze and report on BI data. From simple querying tools, to multi-dimensional analysis to data mining and predictive capabilities, this area of technology has truly been a marvel. The adoption of these technologies as standards in every company has led to a tremendous growth in analytics that explain everything from what product sold yesterday to a deep understanding of the behavior of customers, suppliers, and even competitors. Trends, patterns, predictions of future events - all are part of the growing sophistication in BI analytics.

The ability to perform "right time" analytics is just the latest in the ever-expanding intelligence garnered from this environment.

Third Stage – the ability to act on the intelligence generated from a BI environment. In today's modern BI environment, we have come full circle. Not only do we generate massive amounts of intelligence, but we now integrate that intelligence into our daily operations. BI mechanisms are now built into operations in addition to traditional data warehouses and marts. These right time BI analytics are constantly vigilant, constantly monitoring the health and well-being of the enterprise and send out alerts or alarms to appropriate personnel of events that are abnormal, unusual or generate some cause of concern (e.g., fraudulent activity, operational risk events, market changes, etc.). In some cases, these mechanisms can launch responses or processes thus eliminating the need for human intervention.

The Need for Dynamic Application Management

Yes, we have come a long way with BI. But with the increasingly complex and sophisticated BI environments, we have realized that the ability to supervise and monitor them is just as crucial as the construction process was. Why? To answer this question, let's look at just a few of the trends in BI environments. **First**, there is the explosive growth in data being stored. RFID implementations, operational BI needs, more and more detailed data analytics over longer and longer periods of time - all have contributed to the enormous growth in the amount of data being stored and analyzed. This growth adds to the burden on performance for any BI environment.

Second, there has also been a great increase in the number of users logging into and requesting data from the BI environment. The adoption rate of business users within an organization seems to parallel the amount of data being stored - as the amount increases, the number of users accessing it also increases. In particular, the advent of operational BI has opened up the environment to a very large audience - the front line personnel throughout the organization.

As the number of users increases, the environment performance and overall users' satisfaction can take a significant hit.

With the greater variety and numbers of users comes another factor impacting a BI environment - the types of queries being run. At first, the users run relatively simple queries or reports. As they become more sophisticated in their knowledge of what the environment can do, their queries become more and more complex and ad hoc in nature. These types of queries, if unmanaged, can greatly impact the more routine and simpler queries. Performance suffers if these queries are not planned for, monitored, and supported in the environment.

Even the maturation of the BI tools themselves can cause unforeseen problems with the efficiency and performance of your BI environment. The BI tools range from simple reporting and querying ones to the more complex technologies such as mining and statistical tools. Most BI environments go through an evolution going from simple to complex. More and more technologies are added to the BI mix to satisfy the increasingly diverse and maturing user community. In addition, the users themselves evolve in their usage patterns going from simple access patterns (e.g., straightforward reporting access) to very complex ones (e.g., mobile access using remote devices like PDAs at all hours of the day and night). If not carefully monitored and actively managed during these transitions, overall users' satisfaction and performance capabilities of the environment will suffer.

BI environments have now reached the status of being mission critical in many organizations. This status means that the user community has put greater demands and expectations on the environment for performance, availability, efficiency, and access to the environment anytime and anywhere.

The users expect the environment to be secure and compliant with the enterprise's overall regulatory requirements. These factors lead to the inevitable conclusion that today's BI environment must not only have the best technology available to support the users and their analytics but must also have the best intelligence concerning the environment itself - that is, DAM is now a mandatory part of any BI environment.

The Evolution of Dynamic Application Management

DAM technologies have had their own evolution. In fact, they have followed an almost parallel development path as our BI environments had done. It too has evolved through three stages. The first stage was the realization that BI environments generated a lot of information about their usage, performance, efficiency, and so on. Technologies began to appear that captured this data and stored it for analysis. This first stage was critical to understanding the overall health and well-being of a BI environment. The storage of the monitoring data had to be efficient and readily available for analysis.

The second stage was to analyze and report on the monitoring data to yield intelligence about how the environment is performing - its health and well-being. Once again the technology evolved to include analytical capabilities using the stored data. These allowed BI technologists to understand who was using the environment, how often did they use it, what sorts of queries were the users running and what was the performance of these queries. They were able to determine what data was frequently used and what data was never used. Service level agreements could be more intelligently and accurately set up and monitored for compliance. The actual construction of the query could be examined to determine if it was constructed correctly and efficiently. Finally, these analytical capabilities allowed the technical staff to determine possible security or privacy breaches and to monitor corporate compliance. The analytic capabilities allowed the IT personnel to react to problems with faster and more accurate responses.

The third and final stage is now coming into its own. Just as BI is made actionable in the third stage of its development, the third stage must make the DAM intelligence actionable by creating its own set of alerts and alarms. Breaches in security, compliance risks, and performance problems are not only detected or even predicted, but they are now acted upon in real time - either by notifying the appropriate personnel or by the DAM technology taking actions on its own to prevent or correct the problem. Instead of being purely reactionary, now measures can be taken immediately to ensure that the BI environment is always at its most optimal. With DAM, an organization has the ability to correct inappropriate user behavior in real time. It also means that IT personnel can modify or change a business user's behavior based on immediate feedback to specific situation.

DAM - Providing BI to IT

Many IT Departments have created elegant and sophisticated BI environments for usage by the business community but have neglected their own needs. The analogy is the cobbler's kids who have no shoes. IT had minimal insight into the trends, patterns, and important events happening in their own backyard. Performance was corrected many times only after the business community complained about it. Even after problems were discovered, these were improved more by a trial and error rather than by a rational and informed approach - perhaps an index here, a partition there, a new table created, and so on. Generic operational monitoring tools could give the IT personnel some insight but they still lacked the specificity and ability to handle such a unique environment.

What is needed is a formal approach and a technology specifically developed to gather the statistics and run time information from a BI environment and then automatically take action. DAM is just such a technology. It is used to capture the "operational data" about the utilization of the BI environment, integrating that data into a single record, and then loading it into a data store that is the equivalent to the data warehouse for BI. Once the data is loaded into an accessible data store, it can then be analyzed, sliced and diced, and reported upon just as the data in the data warehouse is.

But DAM does much more than just report on the overall efficiency of the BI technologies. It must prevent certain activities or problems from actually occurring. These could include runaway queries, inappropriate user behaviors, or even degradation of performance. Let's look at these in more detail:

Runaway Queries - a good DAM tool should be able to detect and prevent before it reaches the database any query that is poorly constructed, predicted to run over a certain time threshold, or requiring far too many resources. Certainly there are some queries that are quite complex and should be allowed to run but these are usually in the minority. More often than not, an inefficiently designed query or one that is open ended and cannot be answered is the cause for massive resource consumption. The DAM technology should be able to detect the difference and prevent such queries. It also should be able to alert the IT personnel to a potential situation so that that person may make the determination to take additional action if required.

Inappropriate User Behavior - with the advent of the massive legislation from around the world (Sarbanes-Oxley, Basel II, Patriot Act, COSO, etc.), enterprises have become much more sensitive to what their business community members are doing with BI data. In addition, privacy and security issues are top of mind for many executives. Inappropriate behavior - e.g., requesting secured, sensitive or personal data, attempting to alter data, combining or aggregating dissimilar data, etc. - must be detected quickly and corrective actions taken immediately.

Degradation of Performance - most performance problems do not happen suddenly. There are indicators and signs that performance is about to be degraded. These indicators or signs can be detected before the performance degrades to the point that it is no longer acceptable. The purpose of an DAM technology is to ensure that these problems are in fact detected long before they become hindrances to the business community's usage of the environment.

In addition to monitoring and preventing inappropriate and performance degrading behaviors, another important function of an effective DAM is delivering immediate feedback to users. If user's query is prevented from running and they don't get real-time feedback, they are likely to repeat their mistakes or continue their inefficient behavior, compounding resource waste, performance issues, or compliance problems. A real-time user messaging facility is a critical piece that guides users to better use the resources, ensure compliance, and work more productively.

The ultimate goal of an DAM implementation is to guarantee that the overall BI environment is more efficient and that it is used appropriately. In the end, this technology justifies the expenditures you make for your BI environment. The cost of the DAM technology itself is rapidly justified as well through the improved efficiency, performance, and user satisfaction.

DAM Technology Characteristics

An implementation of an DAM environment will require specialized technologies. Here are some suggestions for what to look for in these management technologies:

Flexibility - the technology that you choose should fit easily into your environment. You should not have to dramatically change your BI environment just to fit the DAM technology. In addition, the users should not have to change their behavior so that the DAM technology works. The DAM technology should react to your world, not the other way around.

All-encompassing - the DAM technology should be comprehensive in its ability to report on a wide range of metrics and actions. Any an all events, activities, and uses of the BI environment must be captured by the technology. If only a subset of these is monitored, you run the risk of optimizing one area while unintentionally de-optimizing another. You must have a complete and accurate view of the entire environment to ensure top performance and efficiency.

Ease of use and intuitiveness - while many monitoring tools capture extensive information about an environment, they do not always present it in a fashion that is easy for the administrators to comprehend much less be able to act upon. A good DAM technology provides an intuitive and insightful interface that provides a workflow to allow the administrators (or business users) to detect issues; they should not have to hunt for them. Notice that the tool must be simple enough for usage by the business community as well. If you really want to be able to change their behaviors, there is no better way to do this than by having them monitor their own utilization patterns.

Provide proactive capabilities - DAM technology should not be only passive; it should provide alerts or alarms to administrators when issues occur and provide recommendations to take corrective actions. Where feasible, the technology should launch corrective processes or actions automatically without human intervention. This one characteristic separates routine monitoring technology from a truly intelligent and innovative one. A sophisticated BI environment should have an equally sophisticated DAM environment supplying the IT personnel with intelligence and analytics about usage and performance.

Non-proprietary in nature - because BI environments use a huge variety of technologies for the storage, access, analysis, and reporting of BI data, the DAM technology must easily and unobtrusively work with a wide range of front-end tools and back-end systems. No two BI environments are alike and the expanse of available technologies can be mind-boggling. The DAM technology must welcome any and all technologies - e.g., databases, implementation tools, delivery technologies, reporting, querying and analytical technologies, and so on. Each must be included in the overall performance and utilization metrics captured in the DAM technology.

Building a DAM Environment

In this final section of the paper, let's discuss what you need to have in place to get started in creating a world-class DAM environment. We begin with the need for policies or rules.

Developing Dynamic Application Management Policies or Rules

Unfortunately there is usually an inherent conflict between IT and the business when it comes to the policies for using the BI environment. IT likes hard and fast rules - it makes their lives easier because there is no "gray area". Unfortunately this can be carried to an extreme. It is not always clear who within the organization should be creating these rules - IT or the business.

Business users, on the other hand, are constantly coming up with exceptions, work arounds, new or unexpected uses of their data. They dislike the idea that they may be restricted in how and when they use the BI environment, regardless of the impact on the IT staff trying to maintain the environment. They may not understand the ramifications of their actions on others using the environment either.

Perhaps what is needed is education for both IT and the business community in terms of why DAM is needed. It is not a punishing or a restricting process. Rather it should be looked upon as providing guidance to construct queries better, to focus them more so that they return more precise answers, more exact results. The ability to analyze queries is not to point fingers but to determine where the query could be written with more precision. The ability to guard against poorly constructed queries is not to restrict the business user from getting results but is to help the person understand their needs better, to stop wasted efforts and unnecessary reworks.

Properly developed policies or rules, along with education about why they are needed, is the best way for both the business users and IT to get what they need. IT gets a better handle on how to improve performance and efficiency and the business users get better results and more effective decision-making.

Getting Started

Before selecting a DAM technology, you should create a detailed architectural depiction of your technical environment. This includes an inventory of what technologies you are currently using - databases, BI tools, delivery mechanisms, etc. These become the baseline for what interfaces your DAM technology must handle. Then use these known interfaces along with the characteristics mentioned above to select the appropriate DAM technology for your enterprise.

The next step is to identify the pain points or known bottlenecks that need monitoring and management capabilities placed upon them. Not everything may need to be monitored so it is up to the IT staff and knowledgeable business users to make the determination for where the environment should be monitored and managed right off the bat.

After installing your DAM technology, you can begin generating reports on the known pain points. There are usually four or five top reports that are compelling based on the pain points described. These reports give you immediate insight and intelligence into where changes can be made to improve the environment's performance or efficiency. For example, you may choose to examine how many different applications are actually in use and who in the business community are really using them. A next obvious report concerns the types of queries that are being executed. You should be able to determine the length of time for each query to be resolved, the total number of queries, what performance problems they encounter and so forth. Early reports also give you immediate insight into what tables or columns are most frequently used - and what tables or columns are never used. If these reports are HTML-based (a recommendation on my part), then others can log into your intranet site to view them. This begins the process of opening up the environment and educating the users about how they can help themselves.

As the DAM process matures, you will see three phases of evolution. At first, people will focus on what drove them to buy the DAM technology to begin with. For example, you may find that the first four or five reports are very popular as are the development of the first few dynamic application management rules or policies. With time though and as the DAM technology begins to capture more and more intelligence about the overall BI environment's usage, a picture begins to emerge that reveals a great deal more about the environment. For example, you may discover that not all of the BI tools purportedly using the environment are really being used. Many times, a corporation buys a BI tool, uses it for a time, and then begins using another BI tool, and moves the older tool into disuse. Unfortunately the users of the older tool may have forgotten to inform IT that the tool is no longer of value.

Secondly, with more history, the users of the environment and the IT staff supporting it begin to determine whether the current tools are in fact the appropriate ones to be using. Many times the types of queries change over time from one form (say multi-dimensional to more statistical in nature) but the tool does not. With sufficient history on the types of queries and their construction, you begin to understand what BI tools should be senesced and whether new ones should be purchased.

Other problems begin to surface as well over time. Are the users sharing IDs? Are there really problem queries or just users that need to be retrained? After about 30-60 days of collecting monitoring information, you should be able to start creating new rules or policies with real intelligence about the environment. With a sophisticated DAM technology, the tool itself can recommend rules or policies to better manage performance and efficiency.

Summary

With the increasingly complex BI environments being created today, it is clear that simple monitoring is no longer sufficient. Mature BI environments require mature technologies to help support and maintain them. We are fortunate today to have such capabilities in Dynamic Application Management software. The intelligence this software gives to the IT personnel as well as to the business community is critical to maintain the over-all health and well being of enterprise BI. These technologies more than pay for themselves in terms of the paybacks from removing inefficiencies and bottlenecks, increasing user productivity, proactively fixing problems, as well as indicating where BI technologies are no longer used, needed, or appropriate. They are now a mandatory part of any BI environment.

The Teleran Approach to Dynamic Application Management

Business intelligence applications and data warehouses are now production systems critical to the enterprise. The growth in users, data and applications has created a greater need for managing these systems, as well as protecting them from inappropriate use. Simply monitoring your application and data warehouse is not enough. To ensure performance, compliance and business value companies need to manage, secure, audit and guide how these systems are used.

Teleran's Dynamic Application Management software is specifically designed to deliver these capabilities, enabling companies to provide better service level management, meet compliance demands, lower support and maintenance costs and maximize application business value.

The Teleran Dynamic Application Management Software

iSight™ usage monitor continuously audits and reports on usage activity and performance at the database, application and user level. iSight is used by organizations to direct performance management, migrations and consolidations, user management and compliance/security auditing.

iGuard™ is a patented rule-based query/report manager that automatically prevents inappropriate, unauthorized or long-running queries and reports before they reach the database and degrade performance, generate incorrect answers or breach compliance or security policies. iGuard includes a real-time **user messaging** system that guides and trains application users to more effectively and efficiently interact with applications and data. iGuard messaging improves performance and productivity, while reducing helpdesk and user support costs.

Benefits

Teleran Dynamic Application Management software enables organizations to:

- Improve performance and service levels
- Comply with PCI, SOX Section 404, HIPAA, and GLBA audit and control demands
- Speed consolidation and migrations
- Improve user experience and IT productivity
- Minimize end user support costs
- Justify IT budgets based on actual resource usage trends
- Deliver a data security layer independent of applications and databases

Customer Case Studies

Performance and Service Levels

Challenge

For many companies, meeting performance expectations and service level agreements is an ongoing challenge. This is especially so when rolling out new applications or consolidating systems into shared services environments. In these situations, usage patterns are always different from what was originally anticipated, and any performance problems at these initial stages can sour user perceptions right from the start.

Case Studies

At a large insurance company, cost cutting measures required the consolidation of six divisional IT centers into one shared services environment. Combining disparate applications, each with unique service level demands and usage patterns, on large servers created an environment of unpredictable performance and fluctuating resource demands. The company has implemented Teleran iSight usage monitoring to identify and quickly troubleshoot performance issues. It also has applied iGuard usage policies that protect the combined system from a few poorly formed queries that degraded performance.

iSight and iGuard are used to ensure performance policies remain effective as usage patterns and resource demands change over time. As a result they have been able to meet cost reduction expectations, while at the same time satisfying service level demands.

At a financial services company, the application director for their Siebel call center system was having trouble meeting service levels. The issue stemmed from marketing personnel who were running long queries against the call center database and slowing overall system performance. iSight was brought in to audit performance and iGuard policies have been activated to protect the system from performance degrading marketing queries during peak call center periods. iGuard user messaging instructs marketing users to refine their queries or schedule them to run overnight. Now, the application director has rolled-out the call center application to 3000 users with confidence that it will enhance customer service and deliver the business value senior management expects. Marketing, in the meantime, is getting the information it needs to develop effective marketing campaigns and design new products.

Compliance and Data Privacy

Challenge

Today regulations such as Sarbanes Oxley and Gramm Leach Bliley, as well as the growing need to protect the privacy of personal data, are driving organizations to devote significant resources to tightening up processes and installing new system controls. The need to ensure regulatory compliance and data integrity is unarguable. However, because the costs of compliance and security are high, organizations are seeking ways to minimize the time, effort and expense of meeting these incremental business requirements.



Case Studies

At a commercial bank, the chief compliance officer needed to ensure that applications met Sarbanes Oxley Section 404 requirements to audit and control user interaction with financial data. IT management was looking for ways to automate the resource intensive manual compliance processes in order to minimize costs and free up IT staff to work on more productive revenue generating projects. Teleran iSight and iGuard provide the audit and policy enforcement controls necessary to satisfy compliance requirements and relieve burdensome manual compliance efforts. This has allowed IT management to redirect staff to other high priority projects, thus lowering the cost of compliance.

At one of the big four military branches of the US armed forces, the program officer in charge of a 5000 user personnel recruiting system needed to ensure the privacy of a huge volume of personal data. Additional controls were needed to audit use of the data as well as restrict access without inhibiting performance or limiting analysis of recruiting trends and effectiveness. iSight provides continuous and comprehensive auditing of the recruiting system without adding overhead while iGuard prevents unauthorized access to detailed private data. This enables the program officer in charge to demonstrate that personal data is protected and that the system performs as needed.

Conclusion

The growth in size and importance of BI and data warehouse environments has made managing these systems, and protecting them from inappropriate use mandatory. Monitoring alone will not ensure the performance, compliance, security and business value organizations require today.

Teleran's Dynamic Application Management software employs patented technology to enable companies to manage, secure, audit and guide how these business-critical systems are used. With Teleran, companies can now deliver improved performance, meet compliance demands, lower support and maintenance costs and ensure application business value.

For more information on Teleran Technologies software solutions go to www.teleran.com.

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