TDWI RESEARCH

TDWI CHECKLIST REPORT

DELIVERING HIGHER BUSINESS VALUE WITH OPERATIONAL BUSINESS INTELLIGENCE AND REAL-TIME INFORMATION

By Claudia Imhoff



Sponsored by







tdwi.org

NOVEMBER 2011

TDWI CHECKLIST REPORT

DELIVERING HIGHER BUSINESS VALUE WITH OPERATIONAL BUSINESS INTELLIGENCE AND REAL-TIME INFORMATION

By Claudia Imhoff



1201 Monster Road SW, Suite 250 Renton, WA 98057

T 425.277.9126F 425.687.2842E info@tdwi.org

tdwi.org

TABLE OF CONTENTS

2 FOREWORD

2 NUMBER ONE

Recognize that not all analytics must come from the data warehouse environment.

3 NUMBER TWO

Match real-time capabilities for increasing BI agility to actual business needs.

3 NUMBER THREE

Determine the proper infrastructure for business-critical operational Bl.

4 NUMBER FOUR

Understand that operational BI is not just a technology solution.

4 NUMBER FIVE

Understand that operational BI is more than simply capturing more timely data.

5 NUMBER SIX

Determine if existing data quality procedures will work for operational BI.

5 NUMBER SEVEN

Realize that operational BI is more process centric than data centric.

6 NUMBER EIGHT

Determine the IT and business skills needed for operational BI.

6 NUMBER NINE

Understand that users of operational BI are not the same as those for other types of BI.

7 NUMBER TEN

Monitor and audit automated decision making in the operational BI environment.

7 ABOUT OUR SPONSORS

8 ABOUT THE TDWI CHECKLIST REPORT SERIES

8 **ABOUT THE AUTHOR**

8 ABOUT TDWI RESEARCH

© 2011 by TDWI (The Data Warehousing Institute™), a division of 1105 Media, Inc. All rights reserved. Reproductions in whole or in part are prohibited except by written permission. E-mail requests or feedback to info@tdwi.org. Product and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

FOREWORD

Operational BI (OBI) is a popular topic in most business intelligence (BI) shops these days, and rightfully so. OBI enables more informed business decisions by directly supporting specific business processes and activities. It supports faster business decisions by seamlessly integrating BI with business processes to create a closed-loop environment for decision making. Finally, it provides a more dynamic business environment where the business can learn, adapt, and evolve based on the analysis of its operational business performance.

Operational BI is defined as a set of applications, services, and technologies for monitoring, analyzing, reporting on, and managing the business performance of an organization's daily business operations.

Implementing OBI can be challenging, but new technologies and more sophisticated users and capabilities are driving organizations toward real-time analytics and information flows. These drivers include:

- The business need for low-latency data to support same-day decision cycles
- The need to minimize OBI's impact on source systems to maximize performance
- The limitations of traditional extract, transform, and load (ETL) solutions in managing big data (increasing data volume, velocity, and variety)

OBI has had a dramatic impact on traditional BI environments and on a new audience of BI users. These users now have immediate access to the insights they need when making decisions about customers, products, and even campaigns while these business activities are happening.

This Checklist Report examines these issues and helps you determine how to align the implementation of operational and real-time BI and analytics technology with true business requirements and capabilities to ensure greater success in reaching business and IT goals.

NUMBER ONE

RECOGNIZE THAT NOT ALL ANALYTICS MUST COME FROM THE DATA WAREHOUSE ENVIRONMENT.

The data warehouse (DW) is a key supplier of data analytics, but it's not the sole supplier of analytics. Other forms of analytics are needed for a fully functioning OBI environment. Because many analytics used in OBI require low-latency or real-time data, organizations try to speed up the overall processes of the DW trickle-feeding the data, automating analyses, and so on—in an effort to make it the sole supplier of analytics. Although this approach works for some low-latency analytics, at some point the DW team must turn to other analytical techniques to complete the OBI picture.

One of these techniques is event analytics. Event data is created by business activities (generated by banking transactions [ATM], retail operations [POS, RFID], market trades, and Web interactions) or by system events (generated by sensors, security devices, or system hardware or software). Event analytics applications often perform their analyses even before the transactional data is stored in an operational system. For example, many fraud-detection applications analyze transactions for fraudulent characteristics first and then store them in transactional systems for further processing. Obviously, the DW contributes to the overall OBI environment by generating the fraud models used by the event analytics software.

Another technique is to make BI analytics (or its results) available as callable services within an operational workflow. Embedded BI services can be external to the workflow (as a part of a serviceoriented architecture) or included within the workflow itself. These services come in two flavors. The first calls a stored analysis or model, uses it dynamically during the workflow, and receives the results before invoking the next activity—for example, calling a stored analysis to dynamically determine a loan applicant's credit worthiness. The second type retrieves the static results from an earlier analysis; for example, a customer service representative (CSR) retrieves a customer's lifetime value score or segment ID stored in a DW. Both types are employed by a business process or person to support real-time or near-real-time business decisions and actions.

The combination of traditional data analytics, embedded BI services, and event analytics forms the foundation of OBI. All three must come together at appropriate points in the workflow to provide a mature and effective operational decision-making environment.

MATCH REAL-TIME CAPABILITIES FOR INCREASING BI AGILITY TO ACTUAL BUSINESS NEEDS.

There is a lag between the time an event happens and the time a company responds to it. This lag is caused by several factors, such as preparing the data for analysis, running the analysis, and determining the best course of action based on the results—for example, taking action when a campaign sells a product that is about to run out of stock. Clearly, the ability to reduce the time to action here (stopping the campaign or changing the featured product) can have significant impact on a company's revenues and reputation. This is BI agility. It requires that the action time match the business need.

However, there is a trade-off. Is it timely enough for the business or is it actually too fast? Even if the business requires reduced latency, can the business users correctly process the inputs that quickly? Can the operating procedures handle the time frame appropriately to ensure a correct reaction? There are many moving parts in an OBI environment, and any that are out of sync or incomplete can cause an erroneous decision to be made. In this situation, the cost of creating such a low-latency BI environment may be more than the actual benefit the company receives.

Another trade-off is the soundness and flexibility of the architectural infrastructure in terms of allowing for delivery of information in different latency time frames (more on this later). Building an OBI solution that is inflexible or fragile just to meet an arbitrary time frame may spell disaster. If the action time requirement changes (and it almost certainly will) from two hours to one hour, you don't want to have to rebuild the entire architecture.

To avoid this situation, the BI implementers must understand how the business community interacts with OBI, from event occurrence to action taken. Interactions must include the impact of the growing usage of tablets and mobile devices. OBI must reach its audience with the appropriate information formatted for the myriad mobile devices available today.

MUMBER THREE

DETERMINE THE PROPER INFRASTRUCTURE FOR BUSINESS-CRITICAL OPERATIONAL BI.

Although traditional BI processing is often critical to business operations, a temporary failure of the BI system will not typically affect short-term business operations. Also, given that the BI system is separated from operational processing, it means that BI processing has little effect on operational performance except during the capturing of operational data.

The situation with OBI is different from traditional BI because it is closely tied to the daily operations of the business. A failure in an OBI system could severely impact business operations. This risk is especially relevant for OBI applications that support close to real-time decision making, such as fraud detection.

There are several approaches to supporting OBI, including embedding BI in operational processes, accessing live operational data, and capturing operational data events and trickle-feeding them to a DW. All of these approaches have the ability to affect the performance of operational systems.

It is very important, therefore, that the infrastructure of the BI system, its underlying DW environment, and related operational systems be capable of providing the performance, scalability, availability, and reliability to meet OBI service levels. The cost of providing such an infrastructure increases as these service levels approach real time, and these costs must be balanced against the business benefits achieved and the ability of the organization to exploit a more agile decision-making environment.

NUMBER FOUR

UNDERSTAND THAT OPERATIONAL BI IS NOT JUST A TECHNOLOGY SOLUTION.

It's critical that BI implementers be able to tie BI applications to operational applications and, even more importantly, with operational processes. Yes, technology is important, but perhaps just as important are the standard operating procedures (SOPs) that must be followed by business personnel. Many BI implementers do not realize that their OBI solution impacts how people perform their jobs. Without understanding how SOPs will be affected, the OBI team can cause severe problems with operations or, worse, find their solutions being ignored or circumvented.

As a first step, the BI team should study, understand, and document the full business workflow using the new BI application. OBI applications can cause big changes to processes and procedures. When they do, the team must determine how the SOPs must change. For instance, will they need to be rewritten or enhanced to include the new OBI application? What impact will this have on the workforce? Who will create and maintain the new SOP?

The team must also determine which personnel will be affected by the new procedures and what training they will need. The team must study how these personnel make decisions, how they access and use information, and how they monitor the impact of their decisions on the company. Training must be ongoing and flexible to accommodate the inevitable turnover in operational personnel. Some of the workforce may immediately grasp this new paradigm; others may not.

NUMBER FIVE

UNDERSTAND THAT OPERATIONAL BI IS MORE THAN SIMPLY CAPTURING MORE TIMELY DATA.

It is often assumed (incorrectly) that OBI simply involves capturing more timely data. Certainly data consolidation (ETL), data replication, and data federation (enterprise information integration [EII]) technologies have advanced to the point that we can capture data and make it available in a far more timely fashion than ever before. For example, using log-based changed data capture (CDC) has distinct advantages for speeding up data integration and processing for a DW. Without doubt, real-time or low-latency data is an important feature of OBI processing. In addition, there are other factors that need to be considered when improving BI agility and supporting faster decision making.

Once operational data has been captured, it needs to be analyzed and the results delivered to the BI consumer, which may be a business user or another application. The time it takes to analyze the data increases the time (the action time) it takes for a business user or an application to make a decision. It is important, therefore, that the actual queries used in the analysis are optimized for good performance. It is also important that the underlying query processing engine is optimized for efficient analytical processing. In some instances, the analytical results may be precalculated to reduce action times (customer lifetime value scores, for example).

The efficient delivery of results to the BI consumer is also important for OBI success. The delivery medium used (dashboard, portal, mobile device, action message) must be selected to match the action time requirements of the business. The availability of automated decision-making features such as alerts, recommendations, and decision workflows can help business users make faster decisions. In near-real-time decision-making situations (fraud detection, for example), fully automated decision-making features may be employed.

NUMBER SIX

DETERMINE IF EXISTING DATA QUALITY PROCEDURES WILL WORK FOR OPERATIONAL BI.

Most data quality procedures are reactive by nature; they detect and fix errors in data after it has been created. For example, during the ETL process, many BI teams invoke a data quality process after data extraction and before data transformation. The true source of the error (the operational system) does not get corrected and, in fact, continues to produce the errors. The more you have to manipulate the data after the fact, the more latency you introduce into the overall process.

OBI requires a more dynamic environment; the faster it gets, the more the data quality processes have to speed up. In fact, an ideal situation for OBI would be to make these data quality processes more proactive than the current reactive mechanisms used. In other words, it is better to fix the data before it gets stored in the operational systems. This approach may not always be possible but should be a goal of the team. Yet another way to speed up the data quality process is to use CDC and run the quality process with low latency following data entry. In any case, the data quality processes must be as rapid as possible to ensure minimal data latency.

To that end, the BI team should understand how "perfect" the data must be for the OBI solution. In some situations, the data may not be perfect but it may be good enough for the OBI application. The team should establish an environment that relies on their ability to prevent problems rather than relying solely on an environment that fixes them.

MUMBER SEVEN

REALIZE THAT OPERATIONAL BI IS MORE PROCESS CENTRIC THAN DATA CENTRIC.

Traditional BI is data centric in that it provides aggregated data analytics that show the performance of the business and its business units at specific moments in time. These data points rarely allow users to see the performance of an individual, ongoing business process. OBI, on the other hand, focuses on the performance of specific business processes and the business activities that make up that process.

OBI processing involves capturing and analyzing data events that can be used to monitor and track the performance of an ongoing business process and its associated business activities. The event analytics produced by this analysis enable organizations to spot bottlenecks in business operations and identify business activities that should be optimized to reduce costs and improve business efficiency.

Therefore, OBI is a process-centric rather than data-centric environment. This distinction means that the business processes and business process workflows that are potential targets for use with OBI must be clearly understood and documented if an OBI project is to be successful. It is mandatory that implementers identify business processes that can tolerate less frequent data availability from those processes requiring the most up-to-date information and that will benefit greatly from an OBI activity.

Although OBI is focused on individual business processes and event analytics, data analytics are often used to put event analytics into a broader business context. Optimizing an individual business process can impact the performance of another business process. Increasing the business performance of Web retail sales could, for example, impact the performance of other retail channels. Using event analytics in conjunction with data analytics enables the organization to balance short-term and long-term business objectives.

NUMBER EIGHT

DETERMINE THE IT AND BUSINESS SKILLS NEEDED FOR OPERATIONAL BI.

Operational analytics is one of the biggest growth areas in BI. This growth is occurring in analytical applications built by the BI group and in analytical solutions built by other groups in the organization. For example, the use of operational Web analytics for optimizing Web site business and technology performance is a rapidly growing area, and the Web development group often builds these analytical solutions. Similarly, content management groups are building content analytics, and operational applications groups are using technologies such as business activity monitoring (BAM) and complex event processing (CEP) to create event analytics.

There are several reasons why these IT groups are independently building their own operational analytical solutions. A key reason is the lack of an overall OBI strategy and senior management oversight. Another important reason, however, is that these types of operational analytical applications often require skills that do not exist in the traditional BI organization. The problem is, of course, that the groups that do have these skills may not always be proficient in the development of applications for business decision making. The net result is political battles, project control disagreements, budget fights, and the incorrect use of technologies.

Interviews with business and IT leaders who have successfully overcome these issues show that the best solution is to remove the dividing lines between different application development groups and create a single development group with pooled skills and resources. Another option is to create competency centers that share skills and knowledge.

UNDERSTAND THAT USERS OF OPERATIONAL BI ARE NOT THE SAME AS THOSE FOR OTHER TYPES OF BI.

Most traditional BI environments support a few hundred or maybe a few thousand users. Opening up the BI environment to operational and frontline personnel means ramping up support to potentially tens of thousands of users. This fact alone can be daunting, but consider performance requirements. These operational personnel expect and require response times that mimic those found in their other operational systems—that is, performance times ranging from a fraction of a second to a couple of seconds for BI queries and analytics.

OBI users also have very different interface requirements and are typically less technically savvy and less analytical in their thinking. They may prefer to use their tablet or smartphone instead of a stationary PC. These differences mean that BI implementers must rethink how BI is delivered to them. They must study their access methods and needs; develop appropriate dashboards, portals, or other interfaces according to these needs; and monitor the community's usage patterns to revamp and revise these interfaces as needed. The interface should bring together the appropriate BI results, BI services, events, and operational capabilities to support each workflow. Furthermore, it should be intuitive in its usage as well as seamlessly embedded within existing operational processes.

NUMBER TEN

MONITOR AND AUDIT AUTOMATED DECISION MAKING IN THE OPERATIONAL BI ENVIRONMENT.

OBI application processing will need to be more automated, as service-level agreements require OBI solutions to provide realtime or near-real-time responsiveness. Application examples include fraud detection, risk analysis, financial trading, call center performance, and, in the telecom industry, network management.

There are many ways of adding automation to the decision-making process, including rules-driven alerts and recommendations, decision workflows, data mining models, and decision engines. All of these approaches rely in some respect on business rules that are developed based on business user expertise or by analyzing business trends and patterns over a period of time.

The problem here is that successful automated or semiautomated decision making relies almost entirely on the quality of the rules that drive decisions and recommendations. Several factors can impact the quality of these rules, including the level of expertise of the users creating the rules and changing business circumstances.

Organizations can become overly reliant on the algorithms and recommendations made by automated models and decision engines. Poor-quality or incorrect business rules can have disastrous business consequences, and it is very important that these rules, and the decisions made based on these rules, are validated and audited regularly. The procedures used for validation and auditing should be a component of the OBI development project.

ABOUT OUR SPONSORS

🧖 ΑΤΤUNITY

Attunity is a leading provider of real-time data integration software that enables access, sharing, and distribution of data across heterogeneous enterprise platforms, organizations, and the cloud. Our offering includes software solutions such as data replication, real-time changed data capture (CDC), and realtime data connectivity, as well as enterprise file replication and managed file transfer (MFT) offered through our RepliWeb division. Using Attunity's software solutions, our customers enjoy dramatic business benefits by enabling real-time access and availability of data and files where and when needed, across the maze of heterogeneous systems making up today's IT environment.

Attunity has supplied innovative software solutions to its enterprise-class customers for nearly 20 years and has successful deployments at thousands of organizations worldwide. Attunity provides software directly and indirectly through a number of partners such as Microsoft, Oracle, IBM, and HP. Headquartered in Boston, Attunity serves its customers via offices in North America, Europe, and Asia Pacific and through a network of local partners. For more information, visit www.attunity.com and join our community on Twitter (www.twitter.com/attunity), Facebook (www.facebook.com/attunity), and LinkedIn (http://linkd.in/attunity).



Sybase, an SAP[®] company, is an industry leader in delivering enterprise and mobile software to manage, analyze, and mobilize information. We are recognized globally as a performance leader, proven in the most data-intensive industries and across all major systems, networks, and devices. Our information management, analytics, and enterprise mobility solutions have powered the world's most mission-critical systems in financial services, telecommunications, manufacturing, and government. For more information, visit www.sybase.com. You can also read Sybase blogs at blogs.sybase.com or follow us on Twitter at @Sybase.

ABOUT THE TDWI CHECKLIST REPORT SERIES

TDWI Checklist Reports provide an overview of success factors for a specific project in business intelligence, data warehousing, or a related data management discipline. Companies may use this overview to get organized before beginning a project or to identify goals and areas of improvement for current projects.

ABOUT THE AUTHOR

Claudia Imhoff, Ph.D., is a popular analyst and dynamic speaker on business intelligence and the infrastructure to support these initiatives. She is the president and founder of Intelligent Solutions, Inc., a data warehousing and BI consultancy. She has co-authored five books on these topics and writes articles and research papers (totaling more than 100) for technical and business magazines. She is an advisor for and was bestowed the title of Fellow of The Data Warehousing Institute and she is the founder of the Boulder BI Brain Trust (BBBT), a membership-only consortium of leading BI consultants and independent analysts. You can reach her at cimhoff@intelsols.com.

ABOUT TDWI RESEARCH

TDWI Research provides research and advice for business intelligence and data warehousing professionals worldwide. TDWI Research focuses exclusively on BI/DW issues and teams up with industry thought leaders and practitioners to deliver both broad and deep understanding of the business and technical challenges surrounding the deployment and use of business intelligence and data warehousing solutions. TDWI Research offers in-depth research reports, commentary, inquiry services, and topical conferences as well as strategic planning services to user and vendor organizations.