

Emerson Process Management—Creative Insight for Complex Reporting

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Introduction

Editor's Note:

Emerson uses Absolute's BBBi software. Since they developed this paper for another vendor, they could not mention our name. See the section on **Oracle Reporting** limitations below. We have added **highlights** for references to BBBi.

The move to consolidated systems and services has given Oracle business applications a significant edge in the marketplace. Businesses are implementing massive Oracle instances that incorporate multiple organizations, sets of books, and operating units. While moving to a single business system offers significant cost saving opportunities, it also presents daunting challenges with respect to business reporting. How can a complex, conglomerate company efficiently get data out of their shared Oracle instance with proper security, performance and accuracy? Like the question, the answer is not simple.

Emerson Process Management consists of multiple divisions and is a leading global supplier of process-automation products that measure, analyze, control, automate and improve process and asset performance for customers in the chemical, oil and gas, pulp and paper, pharmaceutical, food and beverage, power, water and wastewater, and other process-related industries. Emerson Process has recently undertaken the task of moving all of their divisions to a single global instance of the Oracle 11i Applications Suite. Inherent in this effort is the need to provide secure, reliable and accurate reporting to each division and business unit. Reporting requirements were formidable, reflecting the complexities of a worldwide organization made up of 16 divisions with more than 200 locations.

This case study will present an overview of the challenges and insights incurred along the road Emerson Process traveled in their efforts to meet the reporting requirements of a complex, conglomerate organization.

Reporting Challenges: Getting Data out that makes Sense

Oracle Business applications data is organized in thousands of tables with complex relationships and non-intuitive field names. The complex nature of the data structure supports flexibility in the applications, but negotiating the labyrinth of relationships and generic naming conventions in order to extract accurate reports is tedious at best. When the Oracle instance itself is large and encompasses multiple operating units, sets of books and organizations, each with their own customized flex fields, data extraction is almost insurmountable. Getting data out of Oracle in a way that makes sense to the users was the first hurdle Emerson Process had to clear.

Security

Large conglomerate organizations need security that fits their multi-faceted structures. Emerson Process reviewed tools that utilize Oracle Application security, which on the surface may seem like a slam dunk solution for securing data. However, they quickly realized that reporting security is not the same as application security. For example, an order management user is a person who enters and manages orders. They need to see individual orders while communicating with customers and be able to print trade documents such as sales order acknowledgements. The average order management user would not likely be looking at a global report of all orders entered for the day or the period. On the other hand, an order management supervisor needs to see summarized data over time and is likely *not* entering and editing individual orders. Therefore, a supervisor or higher manager probably does not have the order management responsibility assigned to them in Oracle by default. A study of the reporting user

community and an understanding of Oracle security were required to determine the best way to resolve these inconsistencies.

Because Emerson Process is made up of many diverse and somewhat autonomous organizations, preferences for methods to access data varied widely. Needs ranged from the novice or executive user who needed to quickly get answers to specific questions, to the analytical technical user who needed to study trends and statistics. Some of the third-party tools in use included Discoverer, Business Objects, Cognos, Toad, Access, and Excel. The many different methods of access presented yet another security challenge. The solution had to prevent security breaches regardless of the access method used.

Perhaps the most challenging aspect of this project was the requirement to implement semi-cross functional security that would work with multiple interfaces to the data for supporting ad-hoc reporting needs. Some subdivisions of Emerson Process incorporate other sub-organizations. In these cases the organization needed to see data for each of the sub-organizations within them. Other organizations were more autonomous from a security perspective, and therefore only needed to see their own data. Figure 1 gives an example of the type of structure Emerson Process had to work with.

Users in Org 1 Super Organization need to see data for both Org 1 USD and Org 1 CAD, but users in Org 1 USD are only permitted to see data in their own set of books. Furthermore, the Consolidated Shared Services Organization needs to see both sets of books for Org 1 as well as all of Org 2's data. Orgs 3 and 4 only need to see their own sets of books. Corporate users must be able to see all data in the instance.

Figure 1. High level view of a complex organization.



Oracle Reporting Scope Limitations

Absolute's BBBi

Another problem the Emerson Process reporting team faced was the fact that Oracle doesn't contain data to cover all the reporting needs for their organizations. This meant that no reporting tool designed to work with Oracle Business Applications would meet all the various needs of the multiple organizations under the Emerson Process umbrella.

For example, some organizations implemented a subset of the available modules and used legacy systems for other business functional needs. Additionally, several of the businesses within the Process group relied heavily on booking data and required a method to get booking reports before they could go live on Oracle. Oracle Applications do not save changes to bookings transactions, which makes it impossible to get report snapshots of the state of bookings at any given point in history. To address the booking requirement, Emerson Process implemented a bolt-on that captures transaction data and thus makes it possible to report on bookings. An off-the-shelf Oracle Applications reporting solution would not incorporate this data.

Finally, the Emerson Process group is in the middle of a multi-year implementation of Oracle across all of their divisions. The dynamic nature of an environment involved in such a large scale rollout introduces the problem of legacy data reporting needs. Many of the divisions had spent years developing data warehouses and tuned them carefully to their autonomous reporting requirements. The mere size of the implementation precluded Emerson Process from keeping large archives in the production system, let alone incorporating years of data useful for trending and analysis. Whatever reporting tools or solutions Emerson Process implemented had to be flexible enough to incorporate data outside of Oracle Applications when necessary.

Challenges of Outsourcing Internal Services

Outsourcing is certainly common in many large American corporations today. Emerson Process is no different. They have effectively outsourced database management and administration to a centralized group of resources. This enables them to keep tight control on change management and to troubleshoot issues from a pivotal location. It has been a very effective measure in stabilizing the production system.

A key issue that presents itself in implementing reporting solutions where there is a central, outsourced system administration team is the fact that the function of Oracle database administration and reporting development/administration are often conflicting roles. DBAs focus on limiting direct access to the database from areas other than the applications as much as possible and reporting tool implementation requires administrators to have broader access than simply through the applications. DBAs focus on resource conservation and reporting views and tools consume more resources than daily transaction processing.

Emerson Process found that developing reporting solutions was often in conflict with their shared services mission to retain control and restrict access. The reporting solutions they adopted had to be manageable within the constraints of an outsourced system administration group and could not introduce complications to the existing environments and processes.

The Catch-22 of Developing Reporting While Implementing Oracle

To further complicate already complicated matters, the implementation of the reporting solution for Emerson Process had to occur while the Oracle environment was in flux. An Oracle implementation for a company the size of Emerson Process takes several years. Each organization had to go live sequentially so implementing the reporting solution had to work and compete with other projects that were being implemented through the same development and test environments on their way to production. Testing

and scheduling presented an additional set of difficulties, as the organizations needed to analyze reporting functionality in Oracle test instances that were customized for their own individual project requirements. The reporting solution had to accommodate all these needs.

Solutions:

Getting Data Out: A Foundation to Build On

To address the problem of getting sensible data out of the Oracle database, Emerson Process found a great solution that quickly gave them a foundation on which to build. Noetix Corporation offers a reporting tool suite founded on a collection of views generated by a proprietary database crawler, Noetix MetaBuilder. The crawler detects sets of books, organizations, applications, and customized flex fields and compiles all the data into intuitive views, quickly forming an effective basis for reporting. Noetix goes a step further and generates “Answers” to standard questions that the average business user will likely need. The views and the answers are then available through Noetix WebQuery, a tool for the average, or even novice user to access and meet their own ad-hoc reporting requirements. Users familiar with Discoverer can also access NoetixViews in the Noetix Discoverer EUL. Long term, Noetix offers a dashboard solution that takes reporting to the next level. By implementing Noetix, Emerson Process gave itself a jump start on meeting their reporting requirements.

Reporting Security Solution

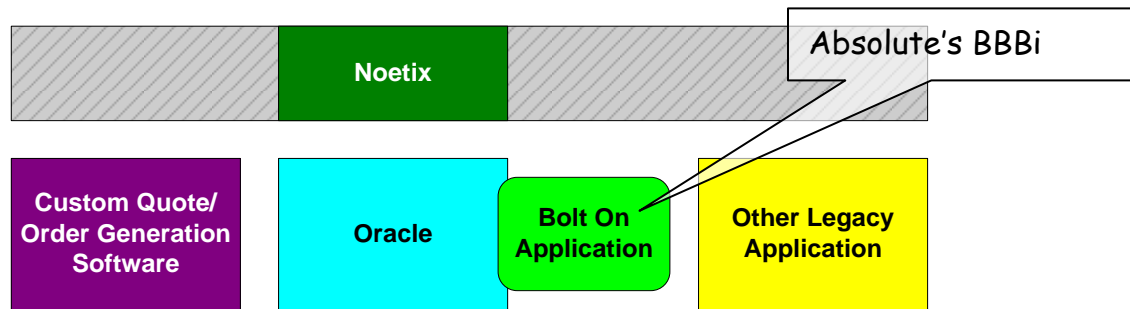
One key advantage to using Noetix technology is the option to utilize Oracle Applications Security. This gives the architecture a single point for user/responsibility management and also provides row level security on the data. However, as mentioned earlier, existing functional responsibilities in Oracle Applications did not exactly meet the requirements for Oracle reporting. Emerson Process solved this problem by taking advantage of Noetix’s ability to leverage Oracle Application security, but with some modifications. First they created Oracle responsibilities specifically for reporting. Each division defined the types of responsibilities they needed and the functional roles those responsibilities would have access to. Then the new reporting responsibilities and functional roles were mapped to each other in a table and the Noetix WebQuery and Discoverer EUL generation processes use the cross reference table to build the security into the Noetix schema. The whole solution required three custom scripts to implement and it meant that reporting Oracle responsibility security could be applied to all avenues of accessing NoetixViews.

Implementing cross-organizational security presented another challenge. While the current version of NoetixViews supports cross-organizational queries, (called cross-op views) it is an all or nothing proposition so an individual who was granted access to cross-op views would see ALL the data for the entire Emerson Process Oracle instance. This did not work for a complex conglomerate company like Emerson Process. (See Figure 1) To address this, the Process group is implementing more customizations to the views generation process. Fortunately, the Noetix solution supports customers’ needs to customize and offers training to help developers become certified to make changes to the Noetix schema.

Resolving Reporting Scope Limitations

By adopting Noetix, Emerson Process had gone a long way toward meeting a majority of their users’ reporting needs with an elegant implementation of a flexible tool. Unfortunately, one of the biggest issues still lay in front of them: All the data needed for reporting did not exist in Oracle. Noetix’s data crawler can only extract data from native Oracle Applications schemas and there was no magic script or crawler that would grab and understand data from the various external sources the Process divisions relied on to get reports. (See Figure 2)

Figure 2. Business data reporting gaps



To resolve this daunting challenge, Emerson Process first had to understand both the problem and the sources of external data. Upon analysis they were able to categorize the gaps in a few key areas:

- Data stored in Oracle bolt-on applications such as the one used to capture booking data
- Legacy data warehouses and business systems, as well as supplemental applications used in conjunction with Oracle to support business processes
- Modules that divisions had not implemented and therefore data for the missing modules was not available for reporting out of Oracle
- Historical data within Oracle. At full implementation it is estimated that due to performance impacts they will only be able to support 6 months of historical data in the production database. Any reporting solution will have to span both the OLTP and Archival Databases.

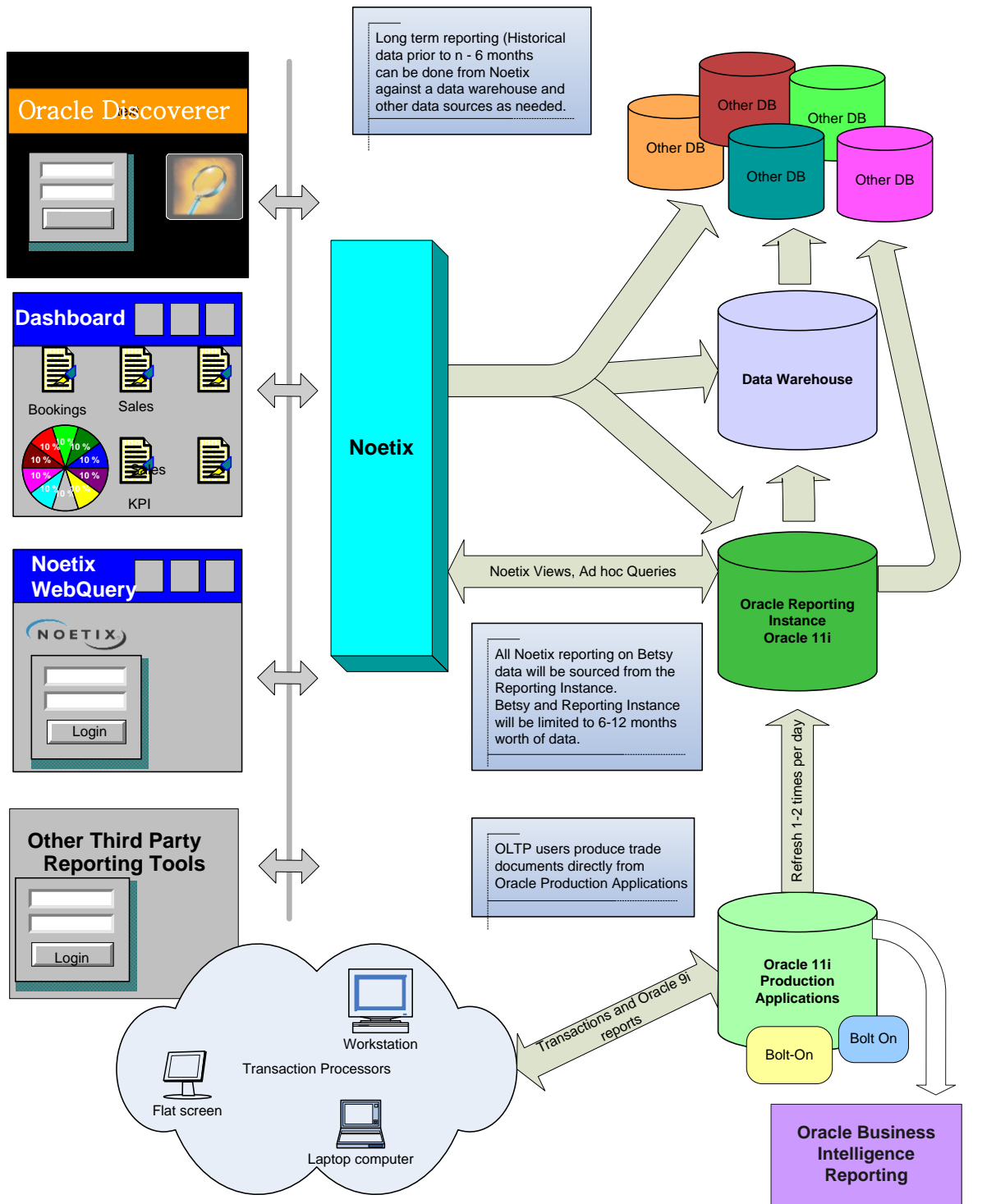
As mentioned in the previous section, Noetix supports customizations of their suite to meet their customers' business needs. Emerson Process has begun sending developers to training to enable them to build custom views within the Noetix framework. The first of these customizations will create views for booking data. Since bookings data is stored in Oracle, this gap is the easiest one to address through Noetix. Furthermore, the development of these views forges the way for future customizations to support other Oracle based bolt-on applications that may be adopted.

Addressing the external data sources and warehouses is not quite as simple. Thus far Noetix had proved itself to be an efficient, relatively quick-to-implement solution to the majority of the reporting challenges. But the Emerson Process reporting team recognized that Noetix would not solve this problem for them, even with customizations. A large portion of the solution to this issue rests on the shoulders of the divisions who own the external data sources. The divisions possess a very strong understanding of their legacy data and have defined key fields that will be used to join with Oracle data. Once the joining points are defined, data extracts from Oracle are built and the divisions develop, deploy and support their reports themselves. The Emerson Process reporting team acknowledged that this is an area best owned by the divisions who possess the strongest knowledge of the data. The expectation is that as historical data grows within Oracle and shrinks in the legacy systems, the shared reporting solution will become more valuable to the divisions and the need for satellite warehouses will diminish.

It was obvious to the Emerson Process reporting team that they would need some sort of warehouse solution to meet the historical data needs. However developing a data warehouse or even integrating with an existing warehouse at the same time as they were implementing Oracle across the organizations was simply not possible. Furthermore a data warehouse already existed for the legacy data. Noetix again offered the strongest possibility of a solution, as long as it could be applied to a reporting instance of the production database that included more data. After all, the views were developed, customizations for bolt-ons were in progress and the data links to legacy divisional data would also be available. Not interested in re-inventing the wheel, Emerson Process is building a reporting instance solution. Upon implementation, the reporting instance solution will meet the historical reporting needs for Oracle data without impacting transaction processing in the Oracle Applications. NoetixViews can also be leveraged

to pull data into the existing Warehouse to provide continuity in reports across old and new system data, or they can be used directly from the reporting instance. Figure 3 provides a bird's eye view of how all the pieces of the reporting solution will eventually come together.

Figure 3: Overall Reporting Solution



Getting In-Sync: The challenges of Outsourcing Internal Services

At first, the Noetix project team found that working with an outsourced central administration group was very difficult. The two teams could not seem to get on the same path. The shared services organization retained control of the views, the Discoverer EUL generation processes, and the Noetix administration credentials, and the Noetix administration team was responsible for the answer generation, Noetix WebQuery and the maintenance of the Noetix Platform. Each time answers were generated for Noetix WebQuery, the teams had to use Web meeting tools to allow the shared services group to input credentials necessary for the Noetix team to proceed. Given that they were involved in the development phase of the reporting project, this task was frequent and cumbersome at best. After many months of struggling to align priorities, several things helped turn it around.

First, Noetix moved from the development and testing phase to production status, which reduced the amount of interaction required between the two teams. Second, the Noetix team implemented concurrent and scheduled jobs to handle a good portion of the generation processes, further reducing the dependence on shared services. Finally, they are in process of implementing read-only versions of the APPS and Noetix Administrator passwords to make the Noetix team almost fully autonomous from the shared services group.

A lesson learned from the entire experience was that when using an outsourced DBA team, it is very much worth the effort to train the DBAs in the shared services group and to build ownership of the reporting tools within the scope of the day-to-day maintenance and administration of Oracle Applications.

Overcoming the Catch-22: Developing Reporting While Implementing Oracle

While reporting is a critical success factor for any business, it unfortunately gets put at the bottom of the task list when implementing a new system. The reasons for this may be obvious: Without a very good understanding of the business system and data within it, it is difficult to define and develop methods to get data out in meaningful ways. Emerson Process had to deal with this issue tenfold since they were going through the implementation process over and over again for each division that adopted Oracle as their ERP solution.

Once again NoetixViews was a tremendous benefit in this process because the proprietary database crawler, Noetix MetaBuilder, detected the custom flex fields and included them in the generated views wherever appropriate. This meant that even if the flex fields changed in the application development process, there was no effort needed to modify the reporting because the next generation of the NoetixViews would include the changes.

The one area that Emerson Process did find challenging was making Noetix available to multiple test instances while still working on the overall deployment of the tools. Initially the generation processes took literally days in the development environment so scheduling was a big problem. Eventually however, with the addition of superior hardware and the new version of Noetix Platform, the generation process time was reduced so it could be completed in a standard weekend. Now making NoetixViews and Noetix Platform available in division specific test instances is an attainable and realistic goal.

Conclusion

Everybody wants the silver bullet; that one product that will solve all their issues and meet every requirement out of the box. Unfortunately, the reality is that there is no silver bullet for Oracle reporting because like every business, every implementation of Oracle Applications is different. Emerson Process found that NoetixViews and the Noetix Platform suite of products gave them a significant lead on meeting their very complicated and broad reporting requirements by quickly providing coherent views translated

from cryptic Oracle data. With a few small customizations, Noetix was able to unravel Emerson Process's intimidating security needs and provide security at the database level where it would apply not only to the Noetix tools, but also to third party query applications. Noetix's flexibility makes it conducive to the growth and change that is standard in companies like Emerson Process and allows them to report on not only native Oracle applications, but **also on data from bolt-ons** and other sources through a single query interface. Despite challenges such as outsourcing and competing with other roll out schedules, Emerson Process has built a robust, scalable, and secure reporting solution on a solid Noetix foundation.

Absolute's BBi is fully integrated with EBS and resides in the same database instance. BBi generates views at install time that utilize the customer's financial and product flexfield structures.

The views are accessible to any reporting tool. Today, ProView for BBi provides an out-of-the-box solution that uses EBS and BBi views.