

CASE STUDY

Microsoft BI for Operational Improvement

Company Description

This company was formed as a result of a merger between two industry leaders in assistive technology. Post-merger the immediate focus was leveraging synergies between the companies to reduce total operating cost. This meant baselining key metrics, identifying areas of improvement, implementing best practices developed over the years from each entity and instituting process improvement initiatives to drive operational excellence.

Both entities had their own in-house custom built applications - one on a Microsoft platform and the other on an IBM Domino (Lotus Notes) platform. Each system had a robust set of reports tuned to the operational requirements of each entity.

The Challenge

As part of the initiative, it was decided to baseline 3 key metrics. The metrics would be gathered for each of the two separate entities along with the combined company. These metrics would then be used to flag problem areas and measure improvements. The three metrics were:

- ❑ Orders in progress - this metric is the monetary value of orders which are work in progress and not yet delivered to the customer. This view helps to identify process bottlenecks and validate revenue projections.
- ❑ Evaluation to Delivery - this metric is the total turnaround time in days from the initial evaluation of a client to the delivery of their order. This data is used to compare turnaround across business units, geographies, local branches, and individual sales representatives. This metric enabled identification of specific areas needing improvement or requiring additional personnel training.
- ❑ Revenue - Classic revenue metrics which can be used to identify areas requiring remediation.

The primary challenge in generating these metrics was the disparity between ERP systems, including the voracity (cleanliness) of the data. Some of the specific obstacles were:

- ❑ Since the initiative was to reduce cost, the preference was to utilize the existing technology landscape to meet the requirements rather than investing in a new solution platform.
- ❑ For identifying areas for improvement, it was necessary to combine the data from the two disparate systems.

CASE STUDY

- ❑ Both systems were custom developed over a period of years by in-house teams. The knowledge of applications and data structures was distributed and documentation was weak.
- ❑ Database schemas of the applications were built for typical transactional systems which posed challenges in analyzing millions of data points required for trend analysis.
- ❑ Product and activity categorization differed substantially between the two legacy systems which made comparing data difficult.

The Solution

After evaluating the systems and sample data, Trigent built an OLAP-based analytics solution which meets both current and anticipated future requirements.

OLAP was decided due to a couple of reasons:

- ❑ The metrics had well defined dimensions through which they can be sensibly analyzed. In such cases an OLAP solution enables predefining the dimensions, making analytics easier.
- ❑ Due to the size of the data, runtime computation would have required heavy investment in infrastructure including a suitable in-memory processing software platform. Since the intent was to minimize change to the technology landscape, a solution that pre-computes summary data was required.
- ❑ The transaction tables were highly normalized. This meant joining tables for meaningful reports required users to have technical acumen as well as an understanding of the database implementation. To make analysis straightforward for the user, denormalization was a must.
- ❑ The client already had SharePoint in their environment. PerformancePoint services in SharePoint have decent visualization features that work very well with OLAP. The client also has Excel along with SSRS (which came with the SQL licensing). Both tools can connect to OLAP to visualize and analyze data.
- ❑ The metrics calculations were complex, depending upon a range of factors with a detailed set of exclusions. Building such complex calculations is easier when executed through code, rather than expecting users to remember the criteria each time a report is built.
- ❑ Metrics were always viewed at aggregated levels and rarely had outlier values. Due to this there was no requirement for having the data viewed real-time. OLAP has its inherent delays with data refreshes, but is a cost effective solution when data relevance is not a major criteria.

For the OLAP approach to be successful, a data warehouse was required to store historic changes made to data. This is particularly needed to analyze time durations

CASE STUDY

to perform an activity. Trigent designed a data warehouse that supported the OLAP.

The last piece of the solution was to build the required ETLs (Extract, Transform and Load Routines) to amalgamate data from two disparate systems and populate the data warehouse. A detailed data analysis was performed by Trigent, which facilitated the designing of the ETLs. The following were ETL features:

- ❑ Data was pulled from both SQL databases and flat files. Incremental data from the IBM Domino application was exported to a flat file using a 3rd party tool.
- ❑ The mapping logic was identified for transforming data coming from transactional databases to the data warehouse. For example, the order type and service type differed between the legacy systems.
- ❑ Data cleansing for outliers and null values.
- ❑ Handling of exception data such as missing relationships, attributes, and out of range dates.
- ❑ Aggregated data based on predefined business logic.

For visualization, the solution was to target based on user role. The largest set of users would like the reports to be viewed regularly without needing to dissect the data. For them, the visualization was built using SSRS. For users who want to drill down into the data, the visualization was provided through SharePoint and for data analysts, the visualization was build using MS Excel. SSRS visualization allowed using to drill through aggregation levels to view data. The report had conditional formatting applied, which highlighted the actionable data to focus on.

Results

Leveraging the Trigent solution, the client's management team is now able to compare the metrics between the separate entities to identify areas of improvement. The solution has prompted the client to initiate a set of improvement projects which will help:

- ❑ Reduce the average turnaround time of activities and order processing as whole
- ❑ Train field technicians on cross-selling and effective selling techniques
- ❑ Focus on high value orders to ensure they are delivered on time
- ❑ Improve the marketing efforts in regions with high potential and low sales
- ❑ Validate the inventory and the staffing are sufficient to complete the orders in the pipeline