STARANALYTICS®
EXTENDING DATA ANALYSIS

FINANCIAL DATA INTEGRATION FOR THE ENTERPRISE: SUPPORTING A SCALABLE EPM SYSTEM

A STAR ANALYTICS TECHNICAL WHITE PAPER

CONTENTS

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Introduction

As business becomes more complex, faster-changing, competitive and global, the requirements for performance management across the enterprise becomes acute. Business users need access to timely, accurate, and trusted data. Companies need to be able to extract data from existing financial analysis applications, centralize, and secure that data. They must be able to ensure governance and regulatory compliance.

Enterprise Performance Management (EPM) is the natural evolution of Business Intelligence (BI) and Business Performance Management (BPM) systems, extending decision-making and accountability across the enterprise. EPM systems require the confluence of data from across the business environment and between all stakeholders: customers, supply chain, internal departments, investors and regulatory bodies.

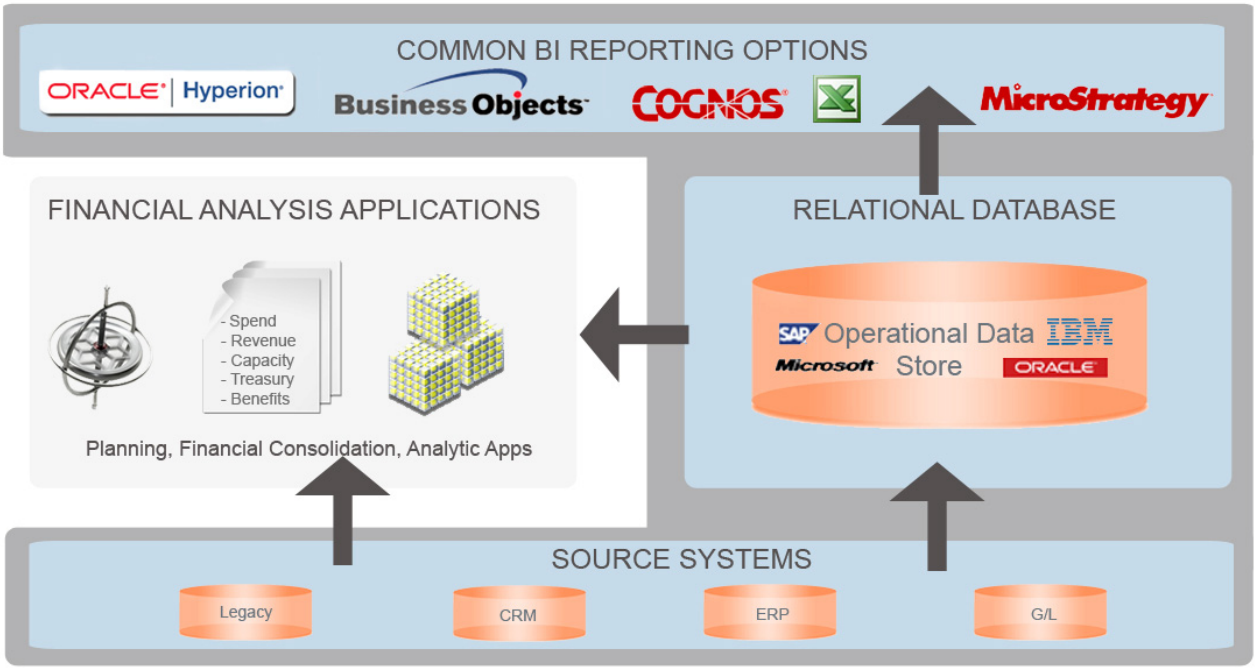
> *The integration of data from across financial systems has risen to be a top priority as the information adequacy of finance organizations is not sufficient today."*
>
> Mark Smith
> CEO & EVP Research
> Ventana Research

This evolution means that BI and BPM applications have now become strategic data sources and need to be efficient in the process of data moving on to its final reporting site. This white paper discusses how Star Analytics provides the unique data integration and automation solution needed to support a scalable and extensible EPM system that leverages the functionality of existing financial analysis application investments in BI and BPM systems.

The Technology Obstacle: Extracting Valuable Information from Proprietary Data Silos

BI and BPM systems have created data silos, with key financial information stored in proprietary financial analysis applications and with data cobbled together from various systems. They cannot scale to meet the requirements of EPM systems, nor do they meet the divergent data needs of Finance and IT organizations.

BI and BPM systems were originally designed as the end reporting point in the data flow, not to have data extracted from them. Data from transactional systems was loaded into data warehouses, giving a historical view business performance. For more advanced analytics, BI data could be moved to OLAP data marts for advanced calculations, consolidations, conversions, and hierarchical views for scenario analysis. However, the proprietary technologies that enable OLAP analysis inherently create more data that exists only in the OLAP store, and associated metadata that is isolated from other enterprise applications. Hierarchies, calculations that vary according to business rules, and assigning user access to different slices of data are examples of growing metadata by-products of BPM applications.



The Disconnect: Proprietary BI and BPM Applications are Outside Enterprise Data Flow

BPM system vendors have long been challenged when moving data between their own applications, without the added complexity of integrating consolidated or derived data, with business rules and security intact, out of their systems. And frankly, there has been no motivation for them to provide such functionality. Conversely, ETL (Extract, Transform & Load) and data integration vendors do not have the understanding of the complex business models built into financial analysis applications' hierarchies to successfully migrate data, metadata and security models.

Requirements for Enterprise Financial Data Integration

An effective EPM system requires an architecture that meets the current and future needs of both business users and technology teams, and must bring together data from across the enterprise. One of the critical components of this architecture is the movement and management of data from proprietary BI and BPM applications into a centralized, standard relational repository.

Business users require constant access to up-to-date, accurate information from a familiar reporting system. Technology teams need to ensure that data movement is consistent and automated, making certain data quality and regulatory compliance. The following attributes are necessary for best-practice data movement and integration, and to support both business and IT functions.

Business/Finance Evaluation Criteria		
Attribute	**Functional Requirements**	**Integration Requirements**
Usable	♦ Business hierarchies represent how the business actually operates and measures itself ♦ Users readily understand and navigate the business model defined through the hierarchies ♦ Global users have 24x7 access to up-to-date information ♦ Users can use reporting tool of choice	♦ Transform multidimensional ragged hierarchy to a balanced hierarchy for familiar drill paths within the reporting environment ♦ Exports only changed data ♦ Supports all standard reporting tools
Credible	♦ Users have high confidence in the integrity and consistency of the data. Without high confidence, suspicious-looking numbers are questioned by users as possible errors; users create one-off spreadsheets because they don't believe the reports and underlying data. ♦ Data is refreshed frequently to be highly relevant	♦ Centralized financial data warehouse provides a unified view of financial data and single source of truth ♦ Data is current and refreshed on demand ♦ An auditable, physical record is created for dynamic calculations
IT/Technology Evaluation Requirements		
Attribute	**Functional Requirements**	**Integration Requirements**
Predictable	♦ Ability to predict what effect a change to a hierarchy, calculation script, data load rule or business rule will have on the data model, data integrity, and system performance. ♦ Necessary system maintenance and batch operations occur on set schedules with a consistent duration.	♦ Scheduler ♦ Notifications ♦ Automation ♦ Set processing windows
Maintainable	♦ Administrators can maintain the applications themselves for most day to day revisions and refinements of the data model. ♦ Specialized consulting is necessary only for new implementations or large scale restructuring of the existing application.	♦ Continuous backup and archiving without downtime ♦ Command line scripts ♦ Remote access ♦ Automated batch updates
Scalable	♦ Support large numbers of users without compromising performance or business process functionality.	♦ Security roles are easily replicated ♦ Security framework can be enforced
Extensible	♦ Additional data generating or reporting applications are easily integrated into the existing system. ♦ Applications are easily expanded beyond traditional FP&A (Financial Planning & Analysis) applications to include other enterprise applications	♦ Translate dynamically calculated, non-persisted values into physical records ♦ Can migrate all data, metadata and security to other systems
Auditable	♦ Supports disaster recovery plans ♦ Compliance	♦ Create regular application snapshots ♦ All data and metadata displays timestamp and origin detail

Driving High Performance Integration Using Star Analytics

The value of information stored in financial analysis applications resides in four areas:

1. Data and metadata
2. Hierarchies
3. Business Rules and Calculations
4. Security

In order to make the BI and BPM application data reusable by other parts of the EPM system, we need the means to quickly and efficiently extract all application data and metadata, hierarchy and security content from proprietary financial analysis applications and dynamically create a star schema for standard relational technologies such as Oracle and Microsoft SQL server. Once stored in an RDBMS financial data warehouse in a standard form, content is available for query and reporting across the enterprise via corporate reporting tools that are either relationally or multi-dimensionally based.

Star Analytics provides a unique solution that extends the value of investments in financial analysis applications, addressing a fundamental gap in BI, BPM and data integration vendor offerings: the movement and management of data, metadata and security frameworks, rapidly and securely, across enterprise applications. Star Integration Server unifies data from across financial analysis applications, including previously inaccessible assets such as calculated and derived data, from BI and BPM systems into a standard-based relational store.

Data & Metadata Extraction

Financial analysis applications incorporate data from source transaction and operational systems, as well as from the operational data store. The valuable summary level data used for planning, financial consolidations and analytics are the results of aggregations and complex calculations upon the data. Users create associated metadata such as cell notes that provide context and value to the data.

Star Analytics offers a high performance extraction process that persists valuable dynamic content and metadata from the application as physical records:

- Aggregations
- Consolidations
- Derived data
- Sparse data that is not stored as physical data in the database
- Attribute dimensions
- Financial consolidation paths
- Cell notes

The data is dynamically inserted into a fact table at the heart of the star schema. With the ability to choose entire dimensions or any combination of members for export, either full or partial data subsets can be easily selected. Intelligent extraction of only changed data reduces extraction times exponentially; when combined with multithreading capabilities, data extraction can be reduced from days or hours to minutes (see Comparing Data Extraction Methodologies).

Hierarchy Extraction

Hierarchies contain a business model that mirrors the actual business structure; they represent a substantial investment of intellectual capital and staff-hours to define and build, as well as to achieve buy-in and user acceptance. However, this investment is hard to realize elsewhere because of its proprietary form. To make this modeling and analytic intelligence reusable by other parts of the EPM system requires the means to quickly and efficiently extract hierarchy content into easily-tailored, standard formats, such as a star schema within a relational database, that are easily consumed by other applications.

Star Analytics extracts and transforms valuable business hierarchies into table-based star schemas. The star schema design is determined by the model's dimensionality. Dimensional table layouts can be selected for:

- **Parent/Child**: Dimension tables have one record for each member in the dimension. Each record specifies the member name, its related attribute and its immediate parent. As such, the hierarchy relationship is recursively represented.

- **Balanced Hierarchy**: Ragged hierarchies are automatically balanced, which is a requirement for many relational reporting tools. The fact table contains one column for each dimension selected in the respective selection, with the column name reflecting the maximum generation column in the associated dimension table.
- **Master Data Management**: MDM format is an application-specific format that satisfies the importation requirements of specific data relationship management tools.

Once hierarchy information is centralized in a relational repository that can combine both operational and financial information, user communities have virtually ubiquitous access to any type of corporate reporting tool that best suits their needs. IT teams are able to integrate disparate multidimensional application hierarchies into a single-source relational reporting structure.

Business Rule and Calculation Extraction

At the core of analytic applications lies the power of complex calculations that perform business rules. As declarative business rules are defined and custom calculations created, they should be available for re-use across products and process deployments. Centralized business rules provide a mechanism for consistent calculations of complex financial scenarios.

Dimensions, hierarchies and business rules provide the robust structure of the business model. Star Analytics extracts business rules and calculation scripts in conjunction with hierarchies, financial data, and security. By extracting all of these assets into open formats within the relational database structure, decision-makers can access information using a variety of open-standard reporting tools, based on their unique business model and with business rules that are consistent across their applications.

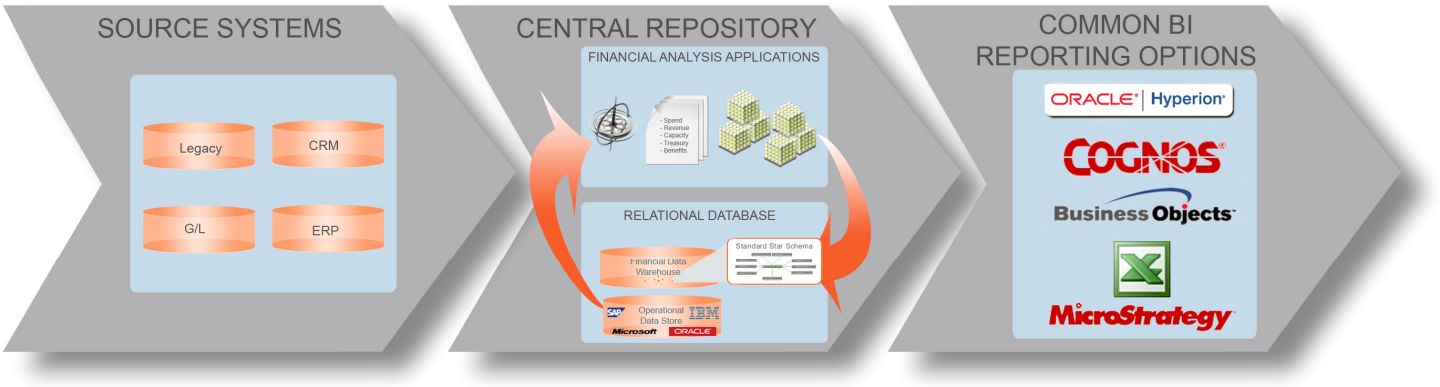
Security Extraction

Financial analysis applications contain sensitive data that should not necessarily be widely distributed. These applications have sophisticated security models for users and groups that provide role or user-based security profiles.

Star Analytics leverages the financial analysis applications' security models so that administrators do not have to replicate profiles for users once information is exported from the proprietary applications. Star Analytics provides cell-level security that is seamlessly exported with data and metadata into the star schema within the relational financial data warehouse. When connecting from any corporate reporting tool, only appropriate, role-based data that is consistent with the financial analysis application access is available to users. This method of security extraction ensures consistency between proprietary financial analysis applications and the financial data warehouse security models, without any duplication of effort by the IT team.

Supporting a Flexible EPM System

Star Analytics' Star Integration Server provides best-practice data integration to support a flexible EPM system. Using the Star Integration Server to address data integration requirements of both Finance and IT, companies can export data automatically, with secure audit systems in place, from their BI or BPM applications. Star Integration Server rapidly extracts large volumes of hierarchical, numerical (aggregated and calculated data) and security content from financial analysis applications into standard star schema formats that meet the requirements of relational databases, or into flat file format. When stored within a central repository, source information is available for query and reporting using any standard reporting tool. Data is preserved across the wider ecosystem, and is available to a larger audience at lower costs of support and maintenance from the IT team.



Best Practice Enterprise Data Integration Process

In addition to its unique extraction capabilities, Star Integration Server provides fully automated processes for moving data, with audit detail included, to support compliance and data governance, as well as ensuring consistent data quality. Automation benefits include:

- **Integrated**: All automation objects, including their related logs and schedules, are maintained in a single centralized repository.
- **Secure**: All system passwords are encrypted within the centralized repository which eliminates maintenance of passwords in clear text files. The system provides for customized system alerts and warnings to incidents such as process failures, data irregularities, system performance and security irregularities.
- **Extensible**: The architecture supports the use of stand-alone utility execution or integrated automation routines through a common interface and acts as a liaison to the various BPM and relational systems.

Star Analytics' solution makes real-time analytics feasible for user communities. The ability to intelligently extract and persist financial analysis data in near real-time allows companies to provide global user communities with 24x7 information access, as the applications never have to be brought offline for updates. Extracting only changed data, information is refreshed frequently, accurate, and highly relevant.

IT teams can create regular application snapshots for archiving and backup without incurring any user impacts. Scheduled, regular archiving can be easily incorporated into a company's disaster recovery plans. Because all application information is extracted from the proprietary source system into a standard relational format, Star Analytics can be used as a cost-effective, efficient migration method if sunsetting BPM applications.

A Rapid Return on Investment

With the evolution of performance management solutions that reflect business processes such as planning and financial consolidation, financial data has exploded across the enterprise. While an unprecedented amount of insight into business has been gained using financial analysis tools, we have done so at the cost of locking our data into disparate, proprietary systems that cannot scale across the larger corporate ecosystem.

BI and BPM systems, which were designed as end points for financial information, have become data sources. Businesses need established mechanisms to efficiently and effectively export all financial analysis application information into standard relational databases for integration with operational and non-financial data, and to be accessed by reporting systems across the enterprise.

Star Analytics offers a unique enterprise-grade software product that combines financial analysis application and data warehousing expertise to unify information across financial analysis applications. Star Analytics is faster and cheaper to implement than custom-built solutions. It offers automated, repeatable batch processes that eliminate manual work and reduce the risk of human error. It can be implemented in a matter of days and can immediately reduce the time required to perform extractions from hours or days to minutes.

Business teams realize the benefits of timely, accurate information delivered to their desktop via the reporting tool of their choice. By retaining hierarchy structures and business rules that were established in financial analysis applications, users traverse familiar drill-paths that reflect their business model. IT benefits from automation and standardization that support the maintainability, extensibility and scalability of current investments. Also, by standardizing on relational database formats, IT teams can leverage relational skill sets and do not have to acquire or develop additional talent for proprietary system maintenance.

Star Analytics ensures that financial analysis applications are well-integrated with existing applications, providing a unified view of customer, operational, or financial activity to lower the Total Cost of Ownership and increase Return on Investment (ROI).

CONTACT US

For more information about Star Analytics, or to download a free trial version of Star Integration Server, please visit our Web site at www.staranalytics.com, contact us by phone at 650-539-4600 or by email at info@staranalytics.com.