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White Paper

Enterprise Data Management
What a modern EDM system needs to offer

This white paper establishes the key components of a "modern" EDM system. It outlines the principal drivers to EDM adoption within financial markets and the business outcomes firms are looking for, and then describes the features required to deliver these outcomes and how such a system satisfies the broader needs of the enterprise.

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Table of Contents

1 Introduction

It has long been recognized that data management needs to be coordinated across the enterprise in order to streamline processes and the flow of information. More recently, evolving financial regulations and advanced risk management techniques have reinforced the need for transparency and a single source of the truth. And, as ever, the relentless drive for operational efficiency and innovation in an ever more competitive environment demand greater agility and, at the same time, greater governance of processes, methods and models.

Enterprise Data Management (EDM) systems have been with us for a long time. Many firms have undertaken large IT projects in an attempt to achieve a truly enterprise-wide platform for trustworthy data to support operations and reporting, but, as with all large projects, issues such as scope creep, cost overruns and the dangers of a "big bang" approach have often impeded their success. The measure of success of a solution designed to be the go-to place for data across the enterprise is whether it has retained that primacy five or ten years down the line. In practice, many find that position eroded as the pace of change in financial markets exposes the inflexibility of older EDM architectures. This inflexibility often leads to tactical responses to new business problems which then become dislocated from the core EDM architecture.

This white paper examines what a modern EDM system should look like now, such that it can still be a modern EDM system tomorrow.

We will first review the environmental factors that are driving the business requirements; then we will describe the goals and outcomes that businesses are aiming for when planning for EDM. We will assess the features and characteristics that an EDM system must possess in order to deliver, and continue to deliver, those results in this environment. Finally, we will consider the needs of the wider enterprise as an EDM system becomes part of corporate strategy and systems architecture.

2 Business and Technical Drivers

We start our discussion with an examination of the principal business and technical drivers that are leading more and more firms in the financial sector to review their enterprise level data management capabilities.

2.1 Regulation & Compliance

The financial crisis of 2008 has resulted in a strong response from financial regulators. All aspects of a financial institution's activities are under scrutiny and, if any are not, then it's likely they soon will be. According to a recent survey by PwC, 87% of banking and capital markets CEOs believe that changes in regulation will continue to have a disruptive effect over the next 5 years.[1]

The effect of these regulations on banks is often to increase capital requirements. As a result, optimizing capital has become a major focus for financial businesses. In a wider context, regulations such as BCBS 239[2], in demanding accurate and reliable risk data, have set a template for data management processes.

Compliance with new regulations is one of, if not the biggest, drivers for reform in data management. While delivering on the latest requirements is the priority, forward-thinking institutions will look for systems that allow them to respond quickly and efficiently as regulations change. At the same time, businesses themselves must be able to adapt as new regulations affect the competitive landscape, with the ability to respond to internal change becoming just as important as meeting external obligations.
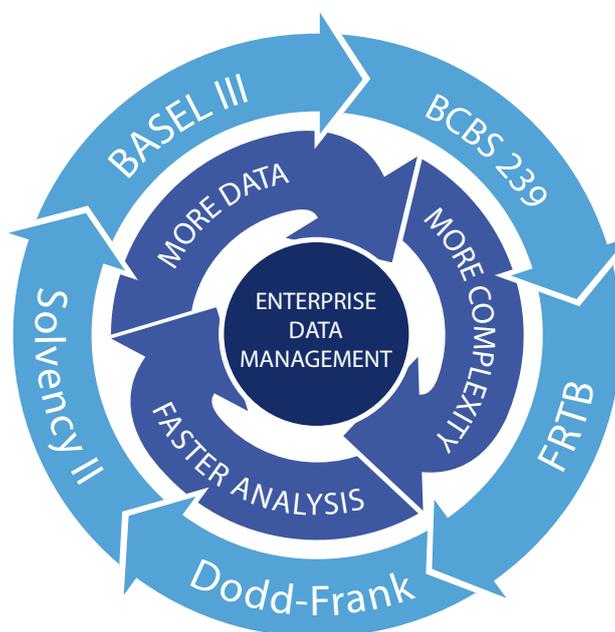
Figure 1: Some of the key regulatory drivers for Enterprise Data Management adoption

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1 PricewaterhouseCoopers (February 2015). Over-regulation and cyber risk top CEOs' list of threats to banking and capital markets growth. Retrieved from http://pwc.blogs.com/press_room/2015/02/pwc-over-regulation-and-cyber-risk-top-ceos-list-of-threats-to-banking-capital-markets-growth.html

2 Basel Committee on Banking Supervision (2013). Principles for effective risk data aggregation and risk reporting. Retrieved from http://www.bis.org/publ/bcbs239.pdf

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One of the recent shifts that exemplify this environment is the renewed focus on market risk alongside credit risk. For a long time credit risk has received the bulk of attention as regulators sought to protect capital markets from the possibility of widespread defaults. Recent events have shown that market factors affecting asset valuations constitute a risk that has been underestimated, and the regulators responded with the Credit Valuation Adjustment (CVA) charge in Basel III. Current proposals seek to align CVA capital requirements even closer with market risk factors[3]. This change in focus and its effect on risk management practices has had an impact not just on the current requirements, but also on the expectations for future changes in requirements.

The following table lists a selection of recent and upcoming regulations that will have a direct impact on data management requirements.

Regulation	Key Milestones	Impact on Data Management requirements
Basel III	1 Oct 2015: Risk requirements take effect	Optimization of risk data aggregation and analysis
BCBS 239	1 Jan 2016: Compliance deadline	Enterprise-wide view of risk, requiring consistent data taxonomies and easily accessible risk data
EU Benchmark regulation	June 2015: Negotiations started	Data transparency, multiple data sources, data governance policies and practice
Corep	1 Jan 2014: UK Corep reporting	Data consistency and transparency, more granular data, coordination between finance and risk functions
Dodd-Frank	21 Jul 2010: Effective date	Aggregation and analysis of disparate data, timely and accurate reporting
BCBS/IOSCO Margin Requirements	1 Sep 2016: Initial and variation margin deadline for large market participants	Data and processes supporting initial margin calculations, exchange of collateral and risk management
MiFID II	Jan 2018: Implementation date	Market data standards as a basis for publication to a consolidated tape
MiFIR	Jan 2018: Implementation date	Greater asset class coverage, Legal Entity Identifiers, accurate, verified and timely data
Solvency II	1 Jan 2016: Compliance deadline	Asset class coverage, data transparency and completeness
UCITS V	18 Mar 2016: UCITS V takes effect	Data governance and data transparency
IFRS 9	2018: Implementation date	Credit risk – upfront recognition of lifetime expected losses on impaired assets. Capital impact phased in
FRTB	2022: Implementation date	New market risk capital framework, risk factor modellability criteria – significant data management implications, change in IMA from VaR to ES

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3 Basel Committee on Banking Supervision (July 2015). Review of the Credit Valuation Adjustment Risk Framework. Retrieved from https://www.bis.org/bcbs/publ/d325.pdf

2.2   Risk Management

The risk management department has always been a major client of the data management function of a business, and changes in risk management continue to be a major driver in EDM requirements.

The history of financial risk management has been characterized by four trends over time[4]:

- **Institutionalization** – the creation of new official institutions and regulations in response to each new financial crisis, and the financial innovations that appear in response to the inflexibility of these institutions;

- **Technology** – the close link between financial innovation and technological advances, from bills of exchange to high frequency trading;

- **Globalization** – the growth in financial activity fuelled by cross-border communication and coordination, and the risks that ensue from connected markets;

- **Complexity** – at every level from the contract to the institution, increasing complexity created the need for professional risk managers, and continues to drive the risk management function.

In this section we will look at some of the current issues in risk management that are impacting the development of enterprise data management.

Figure 2: Changes in risk management driving Enterprise Data Management requirements

2.2.1   Shorter Timescales

Technological advances have enabled analysis and reporting to move from end-of-month to end-of-day to now approaching real-time capability. The desire for the most up-to-date analyses will always be there and EDM has to meet the challenge of more frequent, timelier data while maintaining or improving on data quality, and at the same time handling ever greater volume and complexity.

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4 M. Brose, M. Flood, D. Krishna and W. Nichols (August 2012). Handbook of Financial Data and Risk Information, Volume I. Cambridge University Press

2.2.2   Multiple Risk Systems

Many companies now use multiple risk systems. These risk systems have often become responsible for calculating and managing derived data (e.g. curves, surfaces). Technically this made sense because these systems already possessed the necessary calculation engines; architecturally it is no longer tenable given the need for consistent data across multiple risk systems. Even if risk management is confined to a single system, the demand of other systems such as the OMS and, increasingly, business users doing their own analyses, means that derived data must now sit alongside market and reference data in the EDM system so that it can be shared consistently.

2.2.3   More Markets

Another key driver is the increasing fragmentation of the market across multiple trading venues, which means the modern EDM system must be able to acquire, compare and combine data from multiple sources.

2.2.4   More Data Vendors

Exacerbating the data fragmentation resulting from multiple trading venues, there is a related proliferation of data vendors specializing in different markets and asset classes, putting even more emphasis having an EDM system that can cope and adapt to new asset classes, data types, data formats and sources.

2.2.5   Illiquid Markets

The sparseness of data due to illiquidity in some markets also drives innovation in EDM. As systems grapple with the problem of providing accurate prices and rates, they need to avoid the trap of concealing the risks associated with reporting on sparse data. Here is another area where the responsibilities of EDM must align with risk management.

2.2.6   Complex Data

For a long time risk management has needed to consume complex data structures such as curves, surfaces and cubes. However, the need for data transparency and auditability, and the requirement to manipulate and process large data volumes of these objects, has put additional pressure on EDM systems.

2.2.7 Operational Risk

One of the most obvious signs of the lack of adequate EDM is the proliferation of critical data held in spreadsheets and silos; loosely managed and controlled and lacking any transparency or enterprise-wide visibility. This situation presents a huge operational risk to an organization:

- Such systems are often developed and managed by a single person (in the worst cases an external contractor who has long ago moved on). Little or no documentation is typical and exacerbates the key person risk.

- Governance is usually an after-thought, if it exists at all. Lack of adequate version control of processes and analytics casts doubt on data quality – a risk that is too often ignored.

- Poor documentation and version control, together with the fact that these systems are often part of a tangled web of dependencies, mean that transparency is non-existent and proper auditing almost impossible.

Many organizations rely heavily on such tactical systems, but the inevitable result is that there is a high risk of important decisions being made based on bad data. Spreadsheets in particular cause problems that are not easy to eliminate without losing vital flexibility. This risk is widely recognized and is a major driver in the implementation of EDM.

2.3 Changing Business Models

The challenges of the current business environment will continue to demand greater operational efficiencies and drive the transition toward capital-light business models. Institutions need to be more agile and more innovative even when resources may be stretched. The pace of change means that responding with large-scale IT projects is no longer an option. The need for agility and innovation means that changes to business processes have to be part of "business-as-usual". EDM systems must both anticipate and enable change if they are to be of lasting value to an organization.

Here we review some of the business model changes that are affecting EDM requirements.

2.3.1 Central Clearing

The Dodd-Frank Act and the European Market Infrastructure Regulation (EMIR) both mandate that certain derivatives must be cleared through a central counterparty (CCP). In a conference speech on the issue of central clearing[5], Benoît Cœuré, member of the Executive Board of the ECB, stated that "the global volume of centrally cleared OTC derivatives could rise from a notional value of USD 142.7 trillion, or around 28% of OTC derivatives traded, to USD 268 trillion after migration to the clearing requirement, or 53% of OTC derivatives traded."

One impact of the move to central clearing has been the need to ensure consistency between internal valuations for clearable trades and those used by CCPs. Another function that puts significant demand on data management is collateral optimization, which must have complete and timely reference and market data.

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5 Benoît Cœuré (January 2014). Risk in CCPs. Speech given at the policy panel during the conference "Mapping and Monitoring the Financial System: Liquidity, Funding and Plumbing." Retrieved from http://www.ecb.europa.eu/press/key/date/2014/html/sp140123_1.en.html

2.3.2 Innovation

The 2008 crisis created a public backlash against financial engineering, but innovation still offers a way for institutions to differentiate and grow their business. The demands for transparency may stifle the development of new products, at least in the short term, but there is still much scope for process innovation.

To enable innovation, EDM must provide on-demand data access to business users, together with tools for quickly analyzing complex data sets without necessarily needing programming skills or a deep knowledge of technology. Agility is a key factor too, with the ability to adapt and advance data processes allowing for faster adoption of innovative solutions.

2.3.3 The Growing Importance of the Data Management Function

Enterprise data management has grown gradually from its beginnings as an IT function. Increasingly, organizations are recognizing that data is a vital enterprise asset and needs to be managed with the same level of governance as other enterprise assets such as people, finance and intellectual property. This recognition is clearly seen as more financial institutions raise the management of data to C-level in their organizational hierarchies[6]. In the process, data management has risen in importance from a simple IT function with limited scope to a wide-ranging enterprise function that is a vital enabler of business change and innovation.

3 Desired Business Outcomes

Following on from the drivers to EDM adoption, in this section we will examine some of the outcomes that businesses should look for when implementing an EDM solution.

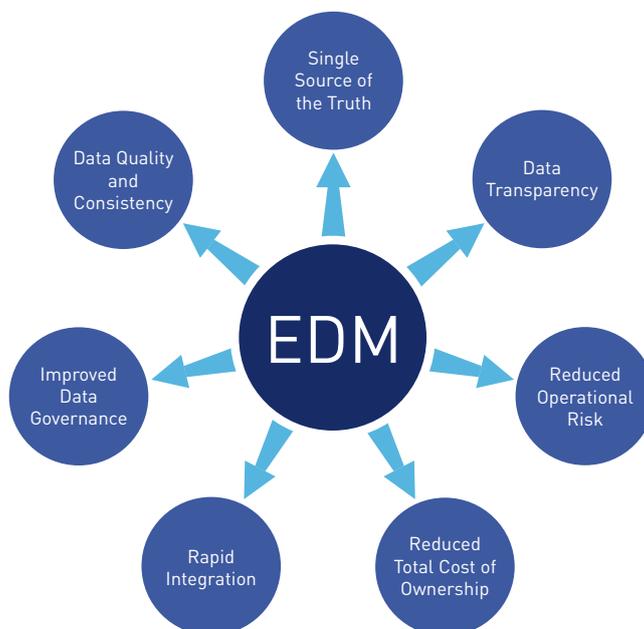*Figure 3: Desired business outcomes from implementing an Enterprise Data Management solution*

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6 Rich Cohen and Ara Gopal. Chief Data Office: New Seat in the C-Suite. Analytics, (September/October 2011), pp. 11-17. Retrieved from http://analytics-magazine.org/septemberoctober-2011/401-chief-data-officer-new-seat-in-the-c-suite.html

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3.1 Single Source of the Truth

A constant refrain in data management is that there should be a "single source of the truth." The obvious benefit of a single "gold copy" is the reduction of conflicts between data used by different departments and desks – conflicts that may result in contradictory reporting and an insecure base for decisions.

The other major benefit of a single source is in eliminating duplicated effort, both in processes and subsequent reconciliation of diverging data. The cost savings from this can be significant.

3.2 Data Quality and Consistency

The existence of a single source of truth is in itself worthless if that source is not trusted. Untrusted data can result either from lack of transparency or obsolete processes and models. Data needs not only to possess quality and consistency, but to demonstrably possess quality and consistency in order to gain trust, i.e. it must be both accurate and reliable.

The desire for a single source of the truth seems inarguable, but we must recognize that different users (e.g. the risk management department and the finance department) often have different data needs or different views of the "truth". As a result, multiple golden copies are often required. In order for these datasets and the relationships between them to become trusted across the enterprise, the processes and people involved in creating each view need to be transparent and readily available to all.

3.3 Data Transparency

The need for processes themselves to be trusted means that users must be able to trace data back to its source. This is easily achieved when all that has happened is that data has been moved from one place to another or undergone simple processes such as scaling, mapping or interpolation. It becomes more difficult when the "gold copy" is derived from multiple sources or from complex modelling. In either case transparency is vital.

Making data and processes transparent means that a query on how a data point was derived can be answered quickly and cost-effectively. This rapid and complete auditability in turn reinforces the perceived data quality.

EDM solutions are traditionally in the domain of the back office, but a modern EDM solution needs to serve the needs of the front and middle offices too. By providing data and process transparency, business users are not only able to spot potential issues but can understand their causes. In the best case scenario this will lead to a virtuous cycle of feedback between users and the system rather than to a demand for additional tactical solutions. Issues can be resolved at source rather than in ways that simply circumvent and hide the real problem and create inconsistencies.

3.4 Improved Data Governance

Good data governance dictates that there are proper controls around all of the processes that affect data. In order to best achieve this, control must be moved as much as possible from IT to operations. The division of responsibility where business users write specifications and IT handles implementation is no longer adequate; end users must be able to view, understand and modify data processes albeit under controlled conditions.

This shifting of responsibility for data management into the hands of business users will reduce the errors due to misunderstood communications and enable faster turnaround of changes and ultimately lower costs.

3.5 Reduced Operational Risk

As discussed earlier, operational risk is greatly affected by the use of spreadsheets and tactical solutions in key processes. Therefore the goal of reducing operational risk should include:

- Fewer business-critical spreadsheets;
- Fewer manual processes;
- Fewer tactical solutions.

All of these in turn lead to less manpower required and a lower cost of maintenance, in addition to lower operational risk. However, the need for business agility that prompted these solutions in the first place should not be forgotten and flexibility must be maintained.

3.6 Rapid Integration

In the current fast-changing environment keeping integration projects short is an important objective not only for cost control, but also because the longer a project takes, the more likely it becomes that the requirements will have moved on by the time it is delivered.

In addition to any initial integration, rapid integration is also needed for subsequent changes. A more versatile solution will enable changes to be made as part of business-as-usual operations rather than requiring further IT projects.

3.7 Reduced Total Cost of Ownership

A well-designed EDM solution should be able to deliver a reduction in the total cost of the data management function, enabling for example:

- Reduced data vendor fees as a result of data source consolidation;
- Flexibility and rapid integration reducing the need for costly-to-maintain tactical solutions;
- Greater automation leading to reduced headcount.

4 Product Features

Having reviewed the business drivers behind a modern EDM solution and the outcomes a company will look for when implementing such a system, we turn to the product features and functional areas it will be covering.
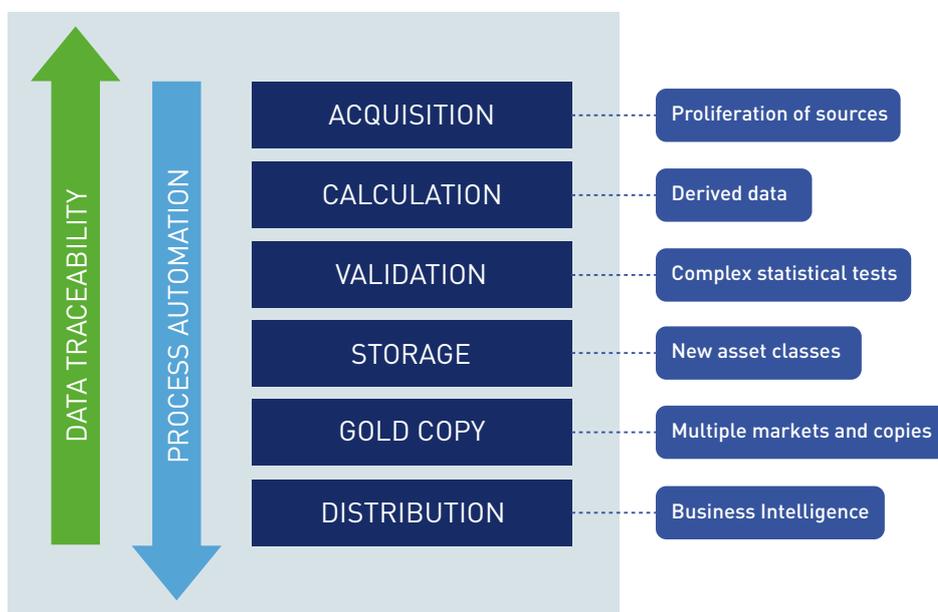

Figure 4: Product features required for a modern EDM solution

4.1 Data Acquisition

In today's environment we are seeing a rapidly growing number of data sources that need to be integrated. The availability of useful data from more sources makes it imperative that new data feeds can be added to the EDM process quickly and cleanly as firms seek competitive advantage by having the best possible data set.

As well as integrating new data, the data acquisition function has to be closely linked to validation, the calculation of derived data and data distribution in order for the overall process to be as efficient as possible. Workflow automation is key to achieving this.

4.2 Derived Data Calculation

The calculation of derived data, whether it's simply a mid-price from the bid and offer, bootstrapping of an interest rate curve, or generating a surface from a stochastic volatility model, is a key component of the modern EDM system.

As with other features, flexibility is important, and the system should not only be able to perform complex calculations, but the algorithms and models should be configurable. It should also be possible to re-use existing calculation libraries that have already been proven.

4.3 Data Validation

The data validation process is another area where automation has always been important, with efficiency improved by keeping manual checking and intervention to a minimum. This principle must be maintained at the same time as more complex validation tests are performed. Systems that can only compare today's price with yesterday are wholly inadequate; data analysts need to be able to apply a full set of statistical and financial analysis tools to the raw data in order to find anomalies. Data points also need to be examined in a wider context, whether that be within the sector, market, curve or surface.

Not only are more complex validation tests needed here, but they must also be easy for users to configure and verify. Adding new validation tests should not require coding or a software patch.

It's also not just the raw data that needs validating. Often data anomalies do not become apparent until the data has been used to derive or calculate further results. Derived data needs to be verifiable together with, as well as in the same way as, the inputs have been. This then prompts another requirement – the ability to re-calculate and re-validate once corrections to the inputs have been made (see Figure 5: Validation process flow for derived data).

Figure 5: Validation process flow for derived data
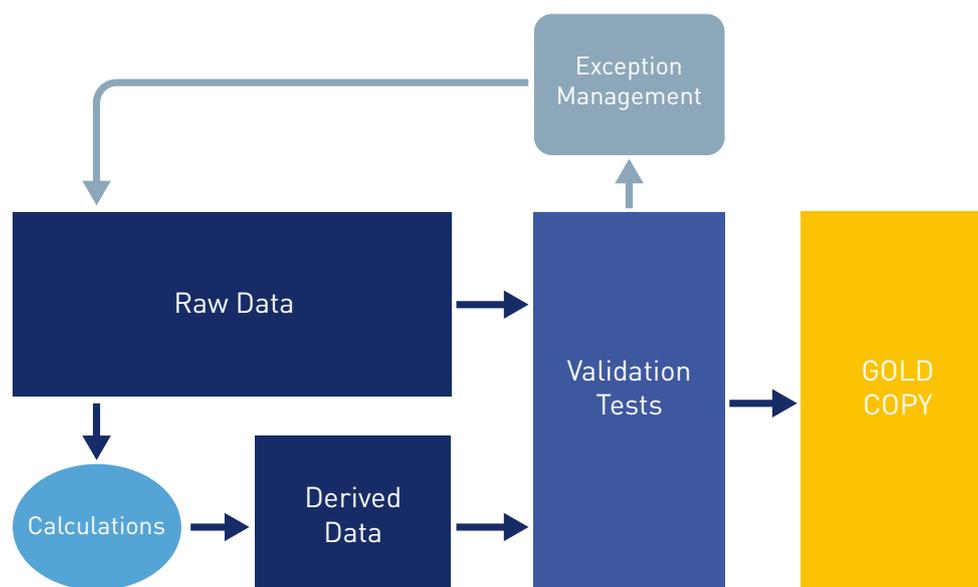
4.4 Storage

For a long time data storage for EDM has meant a relational database, with the occasional concession to proprietary methods for storing time-series data. The complexity and volume of data now required, however, has driven the industry beyond this technology. NoSQL databases, semantic data models and "big data" are all vying for a role in the EDM space.

While new technologies offer interesting alternatives to the traditional database model, we should not lose sight of the underlying storage requirements:

- A robust but flexible data model that corresponds closely to business realities;

- Full and readily-available histories of both market and reference data;

- Data structures that allow simple storage of complex objects (schedules, curves, surfaces, cubes etc.);

- An efficient and performant way to retrieve data suitable for use by all business users.

One of the drivers for these requirements is the need to integrate new asset classes. Historically, this has been the cause of many of the tactical solutions that have proliferated away from the central enterprise-wide data management system. As we mentioned in the introduction, this can lead to the primacy of EDM systems being eroded.

In order to avoid this situation, the EDM solution needs to be able to take on board new asset classes quickly and easily without invoking large expense or long IT projects. At a fundamental level, systems need to be agnostic to asset class – all data types (historic, static, real-time, derived, and complex) must be treated equally. The data model must be flexible enough to cope with new data structures while still retaining integrity and not becoming amorphous. Emerging semantic data models will also have an impact here as the need for transparency requires the meaning of data to be captured as well as its value.

4.5   A Gold Copy for Every Purpose

Global institutions receive and process data around the clock and the data requirements of different desks and divisions are also tied to different markets and time zones. The modern EDM system must be capable of delivering snapshot or end-of-day data at any and every point in the 24-hour cycle.

This often means that multiple 'gold-copy' data sets will be needed, each with their own validation and processing requirements.

There is also the need to be able to share data management responsibilities between different offices and to hand over these responsibilities cleanly between time zones. This process must be flexible enough to handle not just a complex organizational structure but also cope with exceptions such as public holidays.
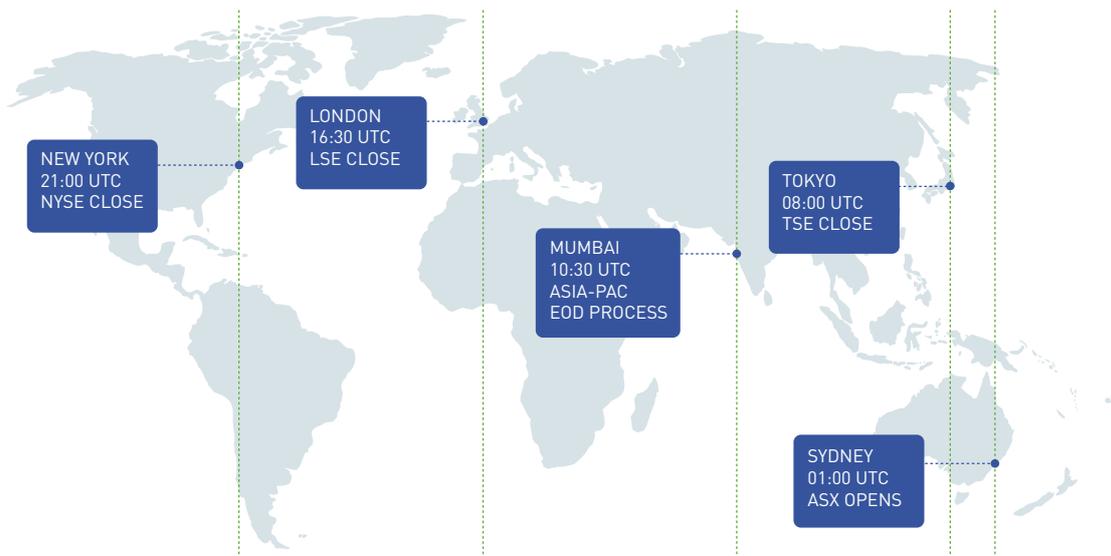
Figure 6: Data management across multiple markets

4.6 Data Distribution, Reporting and Decision Support

Data reporting has not typically been a key feature of EDM systems, but enabling and empowering users by supplying self-service access to data and analytics is essential. Excel is a favourite tool for analysts, and Business Intelligence (BI) tools such as Tableau and Microsoft Power BI are becoming very widely used. A modern EDM system must make it easy for users of reporting and analysis tools to get the data they need – data that has already gone through the required checks and is the same data being used by other downstream systems.

This feature is strongly linked to the data traceability requirement discussed below. If front office users can both access the data they need and understand the processes that produced it, they can be confident in the conclusions they draw from it and the decisions they take. This attribute also supports a virtuous circle of feedback to the data management team as issues can then be both spotted and diagnosed by business users.

4.7 Data Traceability

We have discussed the desired business outcome of data transparency, and one of the main features that will deliver this is being able to trace data to its source.

Tracing data back through a process is a feature that needs to be available to the end-user and not something requiring IT resource. The challenge for a modern EDM system is to enable a business user to answer questions on data provenance quickly and simply.

For reference and market data this means being able to find the original source; for derived data we need to know the input data and the calculation process.

Where data corrections have been made, this should be visible and the updates traceable to the reasons, rationale, time and user involved in the change. The same type of traceability needs to apply to the processes and control parameters of data validation and calculation as well as to the data itself.

4.8 Process Automation

The need for operational efficiency means that businesses will always look to automate processes where possible. Process automation leads to lower costs, but also can contribute to a reduction in operational risk as manual errors are eliminated. This is provided, of course, that the automated processes are designed correctly, which again highlights the importance of transparency.

Automation can and should impact all stages of the data management function, from data acquisition, through validation and the calculation of derived data to reporting and links to downstream systems.

5 Enterprise Needs

Now we have dealt with the functionality provided by our EDM system, we can look at the wider needs of the enterprise. What does an EDM system need to deliver in order to become an integrated part of the overall systems architecture?

5.1 Systems Integration

It goes without saying that the EDM system will need to integrate with other enterprise systems, but in the current environment the surrounding systems are likely to change more quickly. Flexibility is the key, and the successful EDM solution will need many different integration options in order to adapt to a changing environment.

Integration will not just be needed for the beginning and end of the data process – for example, there will often be a need to integrate calculation engines. Again, this needs to be not only possible, but straightforward, quick and achievable without excessive development effort.

5.2 Product Maturity & Vendor Stability

When choosing an EDM solution partner, an institution will usually look for a mature and stable product and vendor. Disruptive technologies mean that new entrants to this sector, as in other markets, can often seem to leapfrog the established players. However, the complexity of the problems means that it is difficult to replicate the specific knowledge and long-term experience of vendors that have been in the market for a longer time. It is therefore necessary to give adequate consideration to both the solution and the services provided by the vendor.

5.3 Deployment and Administration Options

One of the newer technologies having an impact on enterprise systems is the move to the cloud. A modern EDM system certainly needs to be capable of deployment in the cloud as well as on premise, with the choice between the two (or a hybrid of both) not being swayed by any compromises forced by the chosen solution.

Whatever deployment option is chosen, data administrators need to retain control over who has appropriate access to each part of the data set. As EDM systems become more complex, administration controls must keep pace, providing the ability to grant permissions on different data sources and outputs as well as on the rights to validate, correct and change data and processes.

5.4 Solution Pricing

In order for an EDM system to maintain its relevance as requirements change, not only must it be able to adapt, but the associated costs must not be a barrier. As much as possible, change should be business-as-usual, with no 'sticker-shock' caused by adding a process or an asset class.

5.5 Evolving Data Architectures

A discussion on a modern EDM system would not be complete without mentioning the emerging technologies affecting all data management systems: "Big Data", NoSQL databases and semantic data models.

Big data technologies such as NoSQL databases are enabling massive data sets to be stored, accessed and analyzed more quickly and more cost-effectively than ever before. These technologies are driving new approaches to data management, such as data lakes, that are leading some to question whether traditional processes are now redundant. While it is certainly true that NoSQL technologies are changing how data is analyzed, the underlying business needs for standardized, trustworthy, verifiable and transparent data have not changed. Unless implemented carefully, new NoSQL technologies move data further into the hands of the technical specialist and further away from the business users who wish to interact with the data. Technological advances should be embraced but best practices for acquiring, transforming, cleansing and delivering data cannot simply be discarded.

Semantic data models encapsulate the meaning of data (and particularly the meaning of relationships between data). This information has traditionally been only implied in relational data models and had to be understood before the data could be analyzed. The promise of these models is greater transparency and the prospect of greater automation as machine intelligence can then take on more analytic functions such as data validation. Modern and future EDM solutions will increasingly look to take advantage of this technology given the value of "meaning" that can be extracted.

6 Summary

In this final section we will attempt to bring together some of the themes that have run through this discussion. What are the key elements to success for the modern EDM solution, above and beyond its basic attributes and how do these provide the enabling technology for a future-proof data management structure?

6.1 Flexibility

The need to respond to changes in regulatory requirements, risk management and business models dictates that a modern EDM system should be flexible. Just as no data is truly static, no data management system can be static either.

Flexibility is needed everywhere from the integration of new data types and asset classes, to the implementation of new business rules and models, to the creation of new reports and links to new downstream systems. Without flexibility an EDM system cannot remain the primary source of data within an organization.

Flexibility can be an enabler too, for innovation and competitive advantage. Institutions that can quickly change processes and adapt to new opportunities will be primed for success.

6.2 Automation

The second key principle we have seen that appears time and again is the need to implement automated processes. These are needed to enable the move towards real-time risk management for analysis and reporting, and to support the large data volumes required for complex data structures like curves, surfaces and cubes. We have also seen the need for automation to eliminate the operational risk associated with unwieldy manual processes as well as the inefficiency and waste of valuable man-hours cleaning up errors and exceptions.

Stated again, automation can and should impact all stages of the data management function, from data acquisition, through validation and the calculation of derived data to reporting and links to downstream systems. It is only through ever greater automation that the EDM solution can keep pace with the speed of change and development in the industry.

6.3 User-Configuration and Control

Another theme that runs through this whole discussion is the need for end-user configuration and control. Rapidly changing regulations and business models require a system that is not only flexible, but flexible in a way that keeps the business user in control. This means that process changes need to be considered integral to the business-as-usual cycle.

Empowering the business user to configure processes will reduce both cost and operational risk. Changes that once required an IT project, or perhaps prompted the use of a tactical solution or manual work-around, should be incorporated without added cost or risk. Organizational discipline can also make a difference. However, if the system is designed to avoid the problem in the first place then best practice will follow more easily.

Ideally, user control should exist for all aspects of the system with particular emphasis on the areas subject to most likely changes; these include data capture, data validation, process workflow and reporting. These are also the areas are where offering greater user control and customization can have the most impact.

6.4 Integrity

The integrity of the data under management is the next of our themes. Centralized, audited and validated data is needed for all departments.

We have described the operational risk associated with un-centralized data silos and the use of spreadsheets as both a database and an unaudited calculation and reconciliation tool. Incoming regulations require a complete view of risk exposure across departments and regions and this can only be satisfied if everyone is looking at the same, consistent, validated data sets.

And it's not just the raw data that needs validating. As we have seen, derived data needs to be verifiable in the same way as the inputs have been or again we are exposed to inconsistencies, anomalies and bad data down the line.

6.5 Transparency

Our final theme is transparency, which must be present throughout the data management function. Regulation and compliance, risk management and operational efficiency are all key business drivers; all these demand that processes and data be transparent and traceable.

With greater transparency comes higher data quality and consistency, as anomalies are not only more obvious but also easier to explain and correct if necessary.

The efficiency of operations too is greatly enhanced if the business can get a clear view on the end-to-end data process. Combined with the ability to make process changes quickly and easily, this becomes a powerful factor in reducing operational risk.

The theme of transparency affects not only the requirements for data validation and processing, but also the data reporting function, as the need for traceability extends from the system itself to the reports and analyses produced downstream.

Data governance can only function effectively if the people responsible can see and understand the quality of data, the results of processing, and the impact of proposed changes. Only if an EDM system delivers real transparency can this become a reality.

About Xenomorph

Xenomorph provides trusted data management solutions to many of the world's leading financial institutions. The company has more than two decades' experience managing large volumes of complex data and analytics. Over that time, we have consistently reinvested in our technology, culminating in our latest generation enterprise data management platform TimeScape EDM+.

Our software is built to be future-proof. With our rules-based single-stack architecture, flexible data model, easily configurable workflow engine and integrated feature updates, TimeScape EDM+ empowers you to address any future requirements. It can be operated by business users without any prior programming expertise, which means it offers a truly agile and cost effective solution to address evolving business, regulatory and technology trends. The platform also excels at managing and validating model-derived data, thereby enabling firms to address their model risk management challenges by making sure inputs and outputs of business critical models are always validated and kept in sync.

For more information on Xenomorph, our clients, services and solutions, please see www.xenomorph.com.

Xenomorph White Paper: What a modern EDM system needs to offer
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