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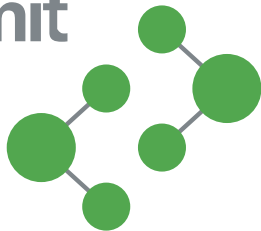


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A Product of Participation

It's difficult to fully articulate and appreciate the critical role data plays in the financial services industry. It's been written before in the pages of *Waters*, but it's worth noting again that data is analogous to blood flowing through the human body: Remove it and the body dies. Additional illustrations of data's pivotal role in the capital markets can be gleaned from *Waters'* sibling publications, *Inside Market Data* and *Inside Reference Data*, which, over the years, have helped inform, shape, and educate their respective communities.

Continuing the data-as-blood analogy, like the body and its myriad complexities that rely on blood for nourishment and the most fundamental requirement to support life—oxygen—every conceivable business process across the buy side and the sell side is contingent on data to some degree. And, like blood, the “purer” the data, the better. Technology also plays an important role when it comes to firms' data management practices, although its part is more that of a supporting actor than the starring role. But make no mistake, without technology, automation of every aspect of the capital markets would be impossible. Data management in our industry is a multi-faceted phenomenon, illustrated by the variety of responses from our seven sources who took part in the virtual roundtable on page five. One issue that did yield something of a consensus, however, is the notion that efficient and effective data management disciplines are not driven by technology projects. In this respect, data management is more of a process, a continuum for which no discernible start or end points exist, and which, in an ideal scenario, combines firm-wide objectives, clear data governance policies, a chief data officer responsible for driving the entire initiative, and of course, the technology underpinning the firm-wide program.

Data management schemes, especially those multi-year, all-encompassing data warehouse projects, have come under scrutiny by executive committees over recent years. And rightly so: Far too often, those initiatives, conceived at the outset to be the panacea for a firm's data-related maladies, failed to deliver anything resembling a half-decent return on the substantial time and financial investments for a variety of reasons ranging from constantly changing sponsors and non-accountability, to scope creep, poor coordination and loosely defined objectives. Now, however, such initiatives tend to be more focused and better disciplined, demanding buy-in and genuine participation from right across the business. ■

Victor Anderson
Editor-in-Chief

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Stress Tests, Data Aggregation Get Bigger Parts in Risk Management

Risk data aggregation efforts are pulling in more sources of data and more functions and tasks, such as stress testing. **By Michael Shashoua**

Stress testing will play an increased role in the industry's efforts to meet the principles set out in the Basel Committee on Banking Supervision's BCBS 239 recommendations, and aggregating the risk data necessary to follow those principles will be a three-layered challenge that will have to connect multiple sources and types of data, according to industry experts from RBC Capital Markets, UBS and S&P Capital IQ, speaking during a recently held *Inside Reference Data* webcast.

"The emphasis is now more on stress testing, which is more deterministic," said Sanjay Sharma, chief risk officer for global arbitrage and trading at RBC Capital Markets. "When doing deterministic analysis, such as for US Comprehensive Capital Analysis Review (CCAR) stress testing, the quality of the data you are using is paramount. If your data is not trackable, uniform or consistent, you will see errors or results that are unspecified or plain wrong."

Institution-wide stress tests have to collect data that is likely to be dispersed among different silos, according to Sharma. "It's a very challenging process to combine all this data into one container," he said. "That's even when there are multiple providers feeding into it."

Three Layers

The three layers involved in cross-referencing data to aggregate it for risk management and to fulfill the demands of stress tests are the entity layer, the instrument layer, and the sector or industry layer, explained Rick Kanungo, senior director of enterprise solutions at S&P Capital IQ. In dealing with entities, legal entity identifiers (LEIs) need to be mapped to vendor IDs, he noted. Without an LEI, vendor IDs may end up being adopted as the primary identifier, he said.

"At the instrument level, many entities—but not all—issue securities, and that could be across asset classes," he said. "The sector

or industry classification level is driven by different regional classifications as well as the classifications used in certain industries."

Kanungo detailed numerous codes and ratings that comprise an intricate web of data that is subject to aggregation, including ones such as the North American Industry Classification System, which denotes the insurance industry, the Global Industry Classification Standard for sector allocations, credit rating indicators particularly relevant for credit default swaps, as well as International Securities Identification Number (ISIN) codes, Bloomberg IDs and Sedols.

"It's a very challenging process to combine all this data into one container. That's even when there are multiple providers feeding into it." Sanjay Sharma, RBC Capital Markets

"All the underpinnings of data frameworks are being established to leverage within the organization and to answer simple questions, such as: What's my exposure to 'X,' which could be a certain entity that made the headlines for good or bad reasons," he said. "At the push of a button, you would be able to aggregate all the entities affiliated with that, mapping an entity back to an organization's holdings and counterparties, and be able to say, 'This is exactly what my exposure is.'"

Connecting and Coordinating

Reflecting the silos that Kanungo described, Simon Feddo, director and head of change for legal entity, client and account at UBS, said his firm had a "splintered view" of



Sanjay Sharma
RBC Capital Markets

entities coming from different vendors. The LEI simplified the risk data aggregation landscape, Feddo said, and now UBS had "a very clear, single, golden-source view of the data we bring into our risk aggregation process."

UBS is still working on aligning transaction data through common feeds, according to Feddo. That starts with charting market risk in its investment bank. "We're trying to agree to principles across the control functions for risk and finance, bringing these control functions together and aligning them, then aligning the data sources across the bank to help pull everything together," he said.

Client-onboarding processes, as well as the creation, maintenance and management of partner data, have changed at UBS in response to regulations and the overall principles reflected in BCBS 239, said Feddo. "We found we must have linkages between our client data, account data and legal trading agreement data very clearly in place for us to understand that the client has a regulation applicable, based on the products in the combination of entities they are trading," he said. "It's become an open process with much more know-your-customer due diligence." ■

Michael Shashoua is editor of *Inside Reference Data*, part of the WatersTechnology stable.

SunGard Builds Risk Reporting Service for Hedge Funds

Financial industry operations software and services provider SunGard has launched a new risk reporting service for hedge funds, providing independently validated data and analytics. The Hedge360 Risk Reporting Service provides detailed risk attribution and stress testing, as required by regulations such as the Alternative Investment Fund Managers Directive in Europe. Risk reports can also be customized for commodity strategies, long-short equity, and specialized credit funds.

Users of the service upload position information via a secure SunGard network. The data is validated by SunGard's managed service team against SunGard APT's

risk model database to highlight exceptions or queries quickly before proceeding to the risk engine for overnight report generation.

"In addition to an efficient, automated service, we offer data enrichment, based on engineered market data such as credit curves and volatility surfaces, which in many cases are of better quality than those easily available to a hedge fund," says Laurence Wormald, London-based COO and head of research of SunGard's APT business. "In this way, we



Laurence Wormald

can characterize the risk on derivatives products with much lower operational overhead than if this were done in-house. Most importantly, our Hedge360 Risk Reporting Service database contains a wealth of historical shock scenarios for

stress testing and proxies for illiquid assets which have been created for institutional clients and are very hard to source," Wormald adds. ■

Nasdaq OMX to Launch Business Intelligence Tool

Nasdaq OMX has announced the launch of MiQ, a business intelligence solution that provides actionable data for exchanges, clearinghouses, central security depositories (CSDs), and other financial market operators across the globe.

The product, developed in partnership with Datawatch, a provider of visual data

discovery solutions, allows users to tap into their data and derive valuable insight from it, according to Nasdaq OMX.

"The launch of MiQ will significantly improve how market operators effectively and strategically manage and analyze their data," says Lars Ottersgård, senior vice president of

market technology at Nasdaq OMX.

"Enabling organizations to be more informed through better data intelligence taken across the entire trade life cycle will help drive liquidity and market share, grow revenues, enhance client services, and stay ahead of the competition." ■

Markit EDM Signs CLAMC as First Chinese Client

China Life Asset Management Company (CLAMC), a Beijing-based provider of life insurance and annuity products with approximately \$300 billion under management, has become Markit Enterprise Data Management's (Markit EDM's) first Chinese client, a move that is expected to lead to more business in the country for the London-based vendor, which has created adaptors for domestic Chinese data feeds and introduced multilingual software.

CLAMC, the largest institutional investor in China's capital markets, chose to deploy Markit EDM's software locally to create a central hub for all of its securities, pricing, positions and transaction data. Markit EDM was chosen following

a selection process that included international and local EDM vendors.

According to Stuart Plane, Sydney-based managing director at Markit, the vendor was chosen because, in addition to satisfying the typical requirements of a large financial institution, Markit EDM has local, Mandarin-speaking support and implementation teams in Hong Kong and has introduced a number of enhancements to its software to suit the Chinese market.

"China has some domestic vendors for data and software that are unique," says Plane. "The data feeds come in the Chinese language, including the documentation. So we built adaptors to the domestic vendors, as part of the proof of concept." He adds these adaptors will now be available to other clients.

Markit EDM has also introduced double-byte software. "That means we can display the data and software in any language the client requires," says Plane.

According to Plane, Markit EDM began talking to CLAMC a couple of years ago, but only embarked on "serious negotiations" with the firm over the past year. He describes CLAMC as a "marquee client," which he believes will lead to other client wins in China for Markit EDM.

"What we have found when pushing into any new market is, once you have one client and have proved you can get it up and running very quickly, and we understand the local requirements, then you will have a number of additional clients signing up afterwards," Plane says. ■

Mizuho Taps GoldenSource for Data Quality, Compliance

Mizuho International has chosen GoldenSource's enterprise data management (EDM) platform to help its investment banking business comply with new regulations by improving data quality and transparency across its London operations.

GoldenSource's platform will replace in-house systems at Mizuho International and is part of a strategic approach to improve data quality and operational efficiency, while facilitating regulatory compliance.

"As a broker-dealer, Mizuho recognizes the importance of establishing links between securities and issuers. Customer due diligence and onboarding, and generally the de-duplication and centralization of securities and counterparty data, have been key drivers for this project," explains Neill Vanlint, GoldenSource's London-based managing director for EMEA.

Vanlint says GoldenSource's 360 EDM platform will help Mizuho International comply with requirements such as the

European Market Infrastructure Regulation, Basel III, and the Dodd-Frank Act.

"GoldenSource will facilitate compliance with these regulations by significantly improving data quality and transparency," says Vanlint. "With an ever-increasing emphasis on the importance of data transparency, data governance-enabling technologies like GoldenSource that prove your data lineage are now essential, both for internal auditing and for external regulatory compliance." ■

NYSE Plans Corporate Actions Data Changes

NYSE Group is planning service and pricing changes for users of its corporate actions data, to take effect on September 1 of this year, according to officials at the exchange operator.

Ticker notices reports will include full corporate actions information from

NYSE's Arca equity platform, which covers more than 1,300 exchange-traded products. Ex-dividend information for these Arca exchange-traded products will be added to its ex-date reports.

In addition, daily corporate actions and ex-date reports will now also

include dividend declaration frequency and comprehensive dividend breakdowns. The exchange also will require approval requests from users distributing its corporate actions data to third parties that are re-distributing that data. ■

BBVA Selects Markit EDM for Spanish, Mexican Data Hubs

Banco Bilbao Vizcaya Argentaria (BBVA) Asset Management, the asset management arm of the Bilbao, Spain-headquartered Banco Bilbao Vizcaya Argentaria banking group, is set to roll out the Markit Enterprise Data Management (Markit EDM) platform to create hubs for the management of its securities, portfolio, fund, issuer and position data in Spain and Mexico. BBVA opted for a locally installed version of the platform, which will be implemented in several phases during 2014.

BBVA will use Markit EDM as part of an initiative to streamline its operations, reduce manual processes and mitigate operational risk. The platform is

also intended to enable business users to access and use the data as part of their daily activities.

"The firm was looking for a truly enterprise-wide solution that could trace back and source where the data came from and who touched it," says Daniel Simpson, Markit's London-based managing director and head of enterprise software. "After several workshops and a successful proof-of-concept, BBVA was confident that Markit could successfully transition and manage its pricing, securities, portfolio, fund, issuer and position data."

Simpson says BBVA's use of the platform may be extended to other Spanish-speaking countries in the future. ■

Interactive Data Hires Lauterbach

Market data vendor Interactive Data has hired Joachim Lauterbach as president, global head and chairman of the board of Interactive Data Managed Solutions (IDMS). Lauterbach, who replaces former Interactive Data Managed Solutions managing director Matthias Paul, joins Interactive Data



Joachim Lauterbach

from consulting firm CSC, where he served as managing director and senior managing partner, initially responsible for its financial services consulting business in Central and Eastern Europe, and then of its consulting business across all industries in the region.

Prior to that, Lauterbach was chief customer officer at German market data provider VWD, and spent the previous 15 years at Reuters, Capco, and Thomson Financial.

Based in Frankfurt, Lauterbach reports to Interactive Data COO Jay Nadler. ■

A Process, Not A Project

Data management challenges proliferate in an industry where success, irrespective of how one might define it, is contingent on clean, reliable and timely data. And, as this virtual roundtable illustrates, effective and efficient data management practices are more a process than a project.



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Q What business processes across the buy side and sell side are currently most reliant on clean, consistent, and up-to-date data?

John Bottega, senior advisor, EDM Council (previously chief data officer, Bank of America): When responding to a regulatory report, for example, you really need to have precise data for measuring liquidity or capital or risk. On the marketing side—and this is the big data side of things—there’s an argument in the industry that says for that type of analysis, maybe the data doesn’t have to be pristine because a lot of the new technologies and ways of trolling through big data can be very informative, without the data being perfect. It’s a little bit risky, because the value of big data evaluation is always going to be contingent on the quality of that data. As firms start to explore those capabilities and what data can tell you, you probably have a little room to extract value from the data without it being pristine, but when it comes to operational functions—financial, risk, compliance—you need precise and accurate data. There isn’t room for inconsistencies and inaccuracies; it’s got to be clean.

Ralph Baxter, CEO, ClusterSeven: One can answer that question by saying that every business process requires clean, up-to-date data, but I think that the one area that has proven most challenging in recent times is wherever you need to aggregate data from multiple back-end sources, and that is particularly true for the ever-increasing waves of internal and external reporting, including regulatory and

client reporting. Fundamentally, as organizations have become more complex, they’ve ended up with more and more back-end systems (databases), and therefore the report at the front end, whoever it is destined for—internally, or for clients and regulators—is dependent on the processes that bring that data in from new data sources alongside all the existing sources. As each link in that process is implemented, the process becomes ever more complicated.

Brian Sentance, CEO, Xenomorph: Risk management is one of our key focus areas for data management, and we are seeing that the current bout of regulation is affecting risk management and the data it uses much more than in any other area within institutions. Regulators have, over the years, always pressed for institutions to improve data quality and control in the data feeding risk models, but both direct data management regulation and indirect consequences of regulation are intertwining to drive big changes in how data is processed and managed in this key area.

Paul McInnis, data management product manager, Eagle Investment Systems: Due to a host of regulatory changes over the last decade, coupled with an ever-increasing amount

of information investment managers need to process and consolidate, there has been increasing pressure on investment firms to be able to provide transparency throughout their investment portfolio. In order to maintain a competitive advantage, improve the decision-making process, reduce trade errors and meet regulatory standards, it is vital to have clean, consistent and up-to-date reference data across the enterprise. This focus on accurate and reliable data has led to the development of the concept of an investment book of record (IBOR), or as we

“Data integration is a huge challenge for larger institutions and I think that this integration has probably received less technological focus than other areas such as database and data management technology. For example, many of the current ‘big data’ technologies are designed more for ‘green field’ application scenarios than for trying to unravel the spaghetti that is the legacy data architecture of many larger financial institutions. That said, you can’t ignore the people aspects and putting together data governance that delivers in practice is still a big challenge.” **Brian Sentance, Xenomorph**

frequently refer to it, “a single version of the truth.”

However, the reality is that many investment managers today are working within legacy systems that were implemented in silos 10 to 15 years ago and are no longer fit-for-purpose, given today’s demands for greater transparency and risk management. As a result, the need for a single version of the truth has emerged as a top business priority and investment managers across the board are collectively stepping back to examine their data management practices to ensure they are utilizing the appropriate technologies and have the right governance in place to be competitive.

John Robertshaw, principal consultant, Investit: Investit's experience is predominantly on the buy side, where we typically find that all pre- and post-investment decision processes are reliant on clean, consistent and up-to-date data. This is because the core buy-side process is the creation of an investment valuation, which shows the current holdings and values of a client/product portfolio. This means that all upstream data processes must be performed in a timely and accurate manner: from the processing and transfer of all client monies to corporate action updates, trade processing, and margin call management. It follows that all downstream data processes will then also be able to be correct. This means that, ultimately, data accuracy is a process, not a project—a process in which all parts of the organization are necessarily engaged, and accountable for the part they play and produce. Data management is necessarily a decentralized activity in most buy-side organizations—it is the management and orchestration of these activities that is the key challenge still facing most practitioners today.

Q How has the introduction of regulations in the US and the pan-European marketplaces spurred capital market firms to manage their data better? Is this data management drive an internal one (company-driven), or an external one (regulatory-driven)? **Enrique Smith, CIO, CIFIC:** If regulatory requirements are the main driver for your data management, you may have other issues. Those trying to stay ahead of their peers will likely encounter the need for better data and better data management before it is required by an agency.

Baxter: The straight answer is absolutely yes. If you look through the last three or four years of regulation on both sides of the Atlantic, there are specific examples of new regulations that focus on data quality, data processes, and manual data manipulation. Those include: the Public Company Accounting Oversight Board (PCAOB) with its staff alert on system-derived data and reports in October 2013; the *Basel Committee on Banking Supervision's Principles for effective risk data aggregation and risk reporting*; the 2013 Committee of Sponsoring Organizations of the Treadway Commission (COSO), where they produced revised guidelines last year around manual data manipulation; Solvency II, which is data-quality and

“Solutions are always a combination of technology and human components. The biggest challenges are about responding to constant change. This means establishing processes that recognize new business needs—often satisfied in the short term by spreadsheets—and putting in place migration processes, which can prioritize these new requirements for more robust solutions. But this is not a one-off requirement. Constant business change creates a continuous conveyor belt of new demands. The most mature organizations recognize this.” **Ralph Baxter, ClusterSeven**




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transparency oriented; and the Federal Reserve's *SR Letter 11-7 on Supervisory Guidance on Model Risk Management* published in 2011.

All of them focus on data, data quality, and data processes as being the key element to satisfactory supervisory or quality-type activity.

I think the regulators have played a huge part in this, but the other aspect that is coming into play is that in the wake of the 2008 global financial crisis, margins are much more under pressure. Whereas before, it was perhaps a lot easier to ignore some of the irregularities in your data because the margins in the business were big enough to overcome them, now, operational efficiency and the contribution that data errors can make to your margins is much greater on a percentage basis. So there is a strong internal drive to focus on data quality as well. If you compare the philosophy around data between UK

grocer Tesco, for example, with its Clubcard business, and a large financial services institution, Tesco had to sort out its data management issues many years ago because its margins are so much smaller.

Mike Atkin, managing director, EDM Council: Are regulations driving data management? The answer without question is yes, absolutely, no doubt about it. It is the reality of linked-risk analysis, where you have to connect instruments and their obligations and entities and rules, and you have to connect indexes and underlyings, and you have to link relationships across your instruments, entities, obligations, and holdings. That requirement is the baseline for all of the systemic risk analysis under way; all the stress testing that's under way; all the transparency objectives under way. All of these things are built off of a baseline of data, and if you don't get it right, the regulators can't perform their function.

It's the "You ain't got no choice" business case, and what it really does is make data management mandatory—mandatory to the top of the house, with the full authority of the process behind it. So it has changed the equation within financial institutions, because now they have an obligation that they have to meet. You can look specifically at the evolution of the risk data aggregation (RDA) principles as a prime example.

McInnis: The global financial crisis of 2008 unfortunately highlighted the fact that capital market firms lacked the proper ability to provide an accurate and reliable picture of their risk exposure. This naturally spurred the introduction of regulations in the US and Europe focused specifically on transparency and proper risk management. These regulations have increased the amount of transactional and counterparty data investment firms are required to manage and report on a regular basis. It therefore follows that a large part of the focus on better data management right now is perhaps unsurprisingly driven by the introduction of and response to these regulations.

The silver lining is that in responding to these regulatory changes and thereby enhancing data governance policies and technologies, investment firms have also been able to reduce their operational risk. The benefits of clean, accurate data extend far beyond complying with regulations, and investment managers have been able to take advantage of those benefits to maintain a competitive edge and create operational efficiencies.

Robertshaw: To the extent that the introduction of regulations in the US and pan-European market places has provided senior sponsoring data management champions with the external leverage to enable them to build a case for a more coherent and unified data management approach internally, they have been useful.

However, the data gathered at behest of regulators has generally only been designed to be of benefit to the regulator, and not used by the fund manager and/or their clients—the submission of European Market Infrastructure Regulation (EMIR) derivatives-related data being a recent case in point. Current regulatory data requests are focused on the firm, not the client. From this perspective we would say the answer is no—regulations have increased the demand for more data more often but this is not necessarily useful, pertinent, or relevant data.

“Data governance is a business decision. Before embarking on a costly data management overhaul, firms need to understand and evaluate their current environment, data sources and operational workflows in order to identify the expected benefits of their future state environment. One of the most commonly overlooked aspects of a data management project is having the right people involved. Senior management and IT must work together and clearly articulate the challenges and benefits of such a large-scale project upfront.” **Paul McInnis, Eagle Investment Systems**



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Indeed, regulations have proved to be a distraction, and have possibly led to a misallocation of resources away from investment in creating accurate client-facing, performance, risk and management information data toward holistic institutional data which has been of little direct use or bearing.

The data management drive has generally been an internally driven one—companies need good data upon which they can

make and execute investment decisions in a timely manner and without error.

The increasing complexity of undertaking portfolio valuations has been due to:

- Complexity of instruments (derivatives)
- Volumes and market conventions
- Unreliable/partial pricing/corporate action sources
- Inherent errors in the data sources
- Inability of core platforms to cope/scale

Furthermore, the desire for clients to see their data accurately in real time (because of

internet) has driven the need for these data processes to work well. In this context, regulations have been an unnecessary distraction that has had no direct bearing on improving the actual performance/risk profiles of funds under management, nor on improving client focus and delivery.

Sentance: On the sell side, for example, you have data management practices directly being mandated with documents such as BCBS 239 but, as I suggested earlier, other indirect effects of regulation are having big effects on data management. For example, capital

calculations such as credit valuation adjustment (CVA) require near-real-time integration and aggregation of counterparty exposures. The motivation to optimize capital costs will probably do more to move to real-time data management and break down data silos at large sell-side organizations than any direct data management mandates. Other regulatory initiatives, such as the legal entity identifier (LEI), were intended to assist in counterparty exposure aggregation but, without parent/ultimate parent data being available, other methods will need to be used. As ever, the effects of regulation are sometimes as intended, sometimes more than intended, and sometimes not what was intended at all.



John Bottega
EDM Council

Bottega: Clearly, the regulatory requirement has spurred markets to respond. It's forced attention, but the good thing is that in any firm, "to satisfy a regulatory requirement" is usually the justified business case—this is not something that's up for debate; it's something that firms have to do.

The good news, though, is that what I have seen is that banks are now looking at the requirements for data management not as a check-the-box exercise—they are focused on implementing the best practices within their firms.

There are lots of regulations around this—perhaps the most prominent one is risk data aggregation (RDA). The principals of RDA direct firms to improve their information infrastructure and their risk practice. What's unique about that regulation is that it's not overly prescriptive; instead, it's based on a series of principles. This regulation has given firms the business case to move dollars to improve their infrastructures and to shore up their risk operations. There will be a lot of benefits to come from that because improving information infrastructure doesn't only benefit risk, but all operations.

Q Typically, what initiatives or approaches can capital markets firms take with respect to improving their data management disciplines? Is the single, enterprise-wide data warehouse model still valid, or are firms looking to deploy smaller, discrete tools that can provide them and their business users with more immediate benefits?

Sentance: Taking a traditional "Well, where to start?" approach to data management, then I believe that risk management is a good place to begin an initiative. It covers all asset classes/exposures and as such is a good place to implement a data management solution that can incrementally be extended to the departments being covered by the risk function. Risk is also highly relevant to the front office, so there is the chance of more involvement and engagement by the front office as they can see

and potentially leverage the data sets being created for use in risk management. Certainly, enterprise-wide data management projects have proven difficult and costly historically, which again biases me to starting small in one department and spreading outwards incrementally. With this in mind, regulation, capital costs, and operational cost control now provide drivers and shared motivations that help to overcome some of the political difficulties that have hindered larger data management projects in the past.

McInnis: Whether a single, enterprise-wide data warehouse model or discrete tools are best to achieve a sound data management strategy depends on the source, owner and consumer of the data. If data is a commonly used asset, such as security reference data, then a centralized approach is in line with a data governance framework. If it is a specialty without the need for use across the enterprise—i.e., quantitative research—then a discrete application makes sense.

However, when dealing with legacy systems especially, it can be tempting to approach data governance by simply focusing on connecting the pipes to get immediate benefits, especially when budgets are tight and resources are spread thin. It is vital for investment managers to remember that sound data management begins with sound data governance—businesses need to own the data, and the process in which it is sourced, and institute an organization-wide data governance vision, which may require both organizational change and a change in IT. Organizations need to recognize good data as an asset and treat it as a resource with value. The quality of that asset is obtained by applying the appropriate business practices, methods and tools to safeguard that data.

Robertshaw: The key initiative every firm can launch is to implement appropriate organization-wide data governance culture and structures so that every element of core data that makes up a portfolio's holdings/valuation/performance/risk should have a clear and relevant data owner; it should also have appropriate process/procedure/accountability underlying its production; and should have workflow, escalation and service level agreements (SLAs) underlying its production.

Only once these data governance structures are in place can advances in technology and tooling be deployed with effect—this is not a technical problem. Technology alone cannot solve data quality. Data quality is a process, not a project—one in which the whole firm is and must be interdependently engaged. Data quality is the output of these individually owned data management processes.

Neither the enterprise-wide data warehouse nor the smaller discreet tools approach is wholly sufficient to achieve data quality. For example, data warehouse models are only as good

as the data that flows into them. The main problem with data warehouses has been and continues to be the tragedy of the commons—unless the data is owned, it cannot be trusted. As such, people will always then find it easier to create their own trusted data source.

Establishing data quality requires much more than simply throwing technology at the problem. In the first instance, organizations require a proven data governance structure that facilitates all core data processes being owned and actioned to an agreed model. Only then does it become beneficial to ensure that each group, team and individual has the tools they need to own, manage and deploy the data under their control. In this context we would expect an increasing use of end-user driven workflow platforms and escalation/incident practices to coordinate and orchestrate data management processes. Crucially, implementing such a program requires major and across-the-board organizational sponsorship and executive support—it must come from the top.

Bottega: Most important is that if you look at information management from the end-user's perspective, the objective is to enable your infrastructure to provide accurate, timely, and consistent data to critical functions. It depends on where a firm is in its technology journey. If its solution is an enterprise warehouse, or if it's satellite "data marts," or a federated data environment with a semantic infrastructure that enables discovery of the data without moving it around—yes, there are evolving technologies, but the focus has to be on the objective and the end-user shouldn't really care how the technology is implemented, as long as it achieves the goal of providing immediate access to critical data.

Now, technologists are smart at this and there are technologies that are coming out that are far in advance of our ability to manage this stuff. If a firm's technology roadmap points to a warehouse environment versus a semantic environment, as long as they get the job done, that's all that matters. Technologists might have different opinions as to the best way to achieve that, but my focus is on the end game.

Baxter: In terms of the initiatives and approaches, I think it's about taking specific business processes and looking at them at a more detailed level. It's very easy to put down visually attractive architectural plans that are far too distant from the day-to-day complexity of what's taking place in the business. However, when you try and solve them at a lower level, that's when you encounter problems. While there is definitely a role for enterprise data warehouses, the idea that a single warehouse is a long-term cure doesn't pay sufficient attention to the real complexity of data aggregation and manipulation in the face of continuing business changes. What people need to think about

is establishing an adaptable environment—one where they're not trying to predict the solution that they build today is going to solve all their problems in the future.

Smith: Partnership with the business is still the single most important ingredient in data management. The tools technology can provide are probably the simplest part of the puzzle. Having everyone aware and agreed to the process those tools support is critical.

The enterprise data warehouse still plays an important role in keeping sanitized "master" data. However, a good master data management (MDM) strategy will also take into consideration the business appetite for intra-day and good-enough/estimated data that can be more cost-effectively serviced through operational data stores or business specific data marts. These all have to be integrated, however, and not considered separate solutions.



Enrique Smith
CIPC

Q: What are the biggest challenges facing buy-side and sell-side firms in terms of their data management practices? Are these challenges mostly technology related, or are they a mix of technology and operational/governance issues?

McInnis: The biggest challenges facing investment firms are due to a lack of proper data governance across the enterprise. Data, and data governance at large, continues to be viewed as a "technology problem," when clearly its value and impact stretches across the firm. In order to leverage the data appropriately and make it most advantageous for the firm, the business needs to be an equal partner with the technology. Good data governance is not a purely technical initiative and should be shared between the managers of the business and the stewards of the IT.

Baxter: Solutions are always a combination of technology and human components. The biggest challenges are about responding to constant change. This means establishing processes that recognize new business needs—often satisfied in the short term by spreadsheets—and putting in place migration processes, which can prioritize these new requirements for more robust solutions. But this is not a one-off requirement. Constant business change creates a continuous conveyor belt of new demands. The most mature organizations recognize this and know that business systems will always contain some tactical spreadsheet systems that will last a few years before replacement. As long as you have transparency and control of the end-to-end data management process, including the spreadsheets, then you have the understanding you need to prioritize and implement continuous improvement.

Atkin: Look at this as a troika of activities. First, there are the data management issues that are not an IT problem but rather a governance problem. Then there are the IT problems—acquire, store, integrate, distribute. And data harmonization—controlled and defined—is a data problem and a governance problem. And then you have the operations staff, and they have to be able to facilitate the daily business functions and understand requirements. It all becomes a little bit more challenging because it's collaborative.

Bottega: Another important thing that has come out of these new regulations is that it's not just about technology. What a lot of these regulations are doing—and what firms are realizing—is there's a lot of focus on context, as well as technology. The technology is the enabler, where it comes down to how you manage the content, which means precise, consistent shared meaning of data; understanding how the data flows; understanding the lineage; and having proper data governance in place, and having a data management program that is driven by policy and standards. Overall, I think that the regulations have had a positive impact on the industry in terms of mobilizing firms to respond to the regulation, which helps improve the infrastructure.

Robertshaw: There are several major challenges facing buy-side firms in terms of their data management practices. Here are some comments in priority order:

- Establishing effective organizational data governance structures/accountabilities—all parts of the organization have their part to play in this respect. A large degree of operational interdependence is required to achieve the necessary levels of data quality.
- Proven methodologies via which data governance can be implemented across an organization are just emerging. Many firms understand the importance of data governance, but don't necessarily know where to begin.
- It is difficult to make tangible return on investment (ROI)-based business cases to implement improvements in data management practices.
- The data market is inherently lacking in quality, hence the need to clean market data. Exchange-based data in particular needs to be cleaned. This is a persistent and ongoing problem, even before you look at data generated within the organization.
- Misdirected and superfluous regulatory interventions and data requirements and a lack of clear requirements/specifications, which are left to the last minute. There is also the failure on the part of the regulators to understand the time and cost it takes to effect change in large firms with daily operations and billions under management.
- Many investment instruments/products are increasingly complex, arcane and difficult to understand, administer and manage—technology/testing processes can't keep up. There is a similar problem when it comes to operational/reconciliation processes.
- Expensive skill sets are required to manage data at the exotic end of the spectrum.

Sentance: Data integration is a huge challenge for larger institutions and I think that this integration has probably received less technological focus than other areas such as database and data management technology. For example, many of the current “big data” technologies are designed more for “green field” application scenarios than for trying to unravel the spaghetti that is the legacy data architecture of many larger financial institutions. That said, you can't ignore the people aspects and putting together data governance that delivers in practice is still a big challenge.

Q How do buy-side and sell-side firms make the business case for embarking on expensive and often onerous data management projects, and what challenges do they most often underestimate/overlook?

Baxter: In our world of analyzing end-user computing, the best contribution to the business case is the provision of visual evidence and analysis of what's actually going on, such as how data is flowing from systems through spreadsheets, back to systems and into other spreadsheets. Very often we find that individual process owners do know what is happening but it is only when that information is presented visually do others also appreciate the real complexity. Once stakeholders are armed with this demonstrable visual evidence over the extent and complexity of manual spreadsheet activity it becomes clear that doing nothing is not an option. But equally the scope of any transformation project needs to be carefully defined as a series of smaller steps to avoid being over ambitious.

Robertshaw: Prior to making a business case, the greatest challenge is to identify a senior data champion who can get overall organizational buy-in at all levels of the organization, including executive level senior sponsorship, and also elicit and nominate operational management accountability. Unless that level of buy-in is there and shared, a data management project should not start.

A collaborative and authoritative implementation approach is required, which recognizes that data management is the new business as usual, and will need to build the organizational structures, accountabilities and escalation processes to ensure data is comprehensively managed—e.g., that the operational, managerial and strategic lines of defense are in place to ensure ongoing data integrity and quality.

Many make the case for data management projects by focusing on client needs and/or the integrity/improvement of the investment process—these are difficult to substantiate in tangible ROI terms. The regulator's new hard line approach to fining firms is creating some more tangible ROI drivers.



John Robertshaw
Investit

Many expect the major challenges will be about technology implementation. However, our experience is that most difficult hurdle is to implement appropriate data governance, processes and accountability regimes. Many overlook the testing challenges involved and underestimate the complexity, time and effort involved—especially managing extended end-to-end data processes and flows.



Mike Atkin
EDM Council

Atkin: There are two things to look at: What's the total size of the bad data tax, and what's the difficulty of getting deeper into this because it's simply hard to do? The data tax is significant. You need to have systems consolidation. You also need to reduce the reconciliation processes while also reducing unproductive headcount by putting those people into better functions.

You also have model precision. A lot of firms are moving to model-based investment and valuation, and these

models require data as one of their input factors. As a result, accurate, trusted data allows them to do what they're supposed to do. So the business case is that it serves the needs of the analytics teams even better—they can report and analyze opportunities, and up-sell better.

No one should minimize the difficulty of unraveling 30 years of acquisition. There are time-to-market and growth pressures. And then there's business silo management: How do you take tens of thousands of applications and unravel them to produce better data? We don't want to misrepresent that—it's hard, expensive stuff, but it also costs a lot to maintain that disjointed, operational environment. Sometimes you swallow hard and invest up front, but the benefit is there at the end or even at the mid-range.

Bottega: It's always challenging in this industry to make the business case for data infrastructure because of the simple fact that data hygiene has not been traditionally viewed as a clear and present danger. Information security is something that everybody recognizes as vital to protecting the firm, so those business cases are usually easier to get agreement on. Data hygiene is a challenge because it's often not something that has an immediate impact, even though there are security concerns if you don't manage your information correctly.

The financial crisis pointed out a lot of weaknesses in our industry, and one thing was the net-effect of having inconsistent data, and not having clarity around unique identification of entities, and understanding lineage—this all put the Street at a disadvantage because data wasn't accessible immediately in order to respond to the crisis. That awareness has helped to make the business case a little easier because data quality does help our

health and well-being. The benefit that I'm seeing is that those implementations are going to have a benefit across other functions. As we build around this regulatory demand, we'll create other capabilities.

Smith: Very few business leaders like to hear the words “no” or “getting that data will take a few days.” Without tackling data management, the spreadsheet-intensive manual processes required to bridge disparate data—when even possible—cause folks to say these things to business leaders. As a CIO, the tough part is getting the leadership to understand that a successful project starts before there is a problem. Speaking the language of the business is really important to get people to understand why this problem needs to be solved before it hurts.

In terms of the challenges buy-side and sell-side firms most often underestimate, partnership with the business is the most important success factor for these (and many) projects. Just getting the check for a project won't get the data stewardship and business processes in place. The technology we put into place is only to support and simplify these business processes.

McInnis: Data governance is a business decision. Before embarking on a costly data management overhaul, firms need to understand and evaluate their current environment, data sources and operational workflows in order to identify the expected benefits of their future state environment. One of the most commonly overlooked aspects of a data management project is having the right people involved. Senior management and IT must work together and clearly articulate the challenges and benefits of such a large-scale project upfront. Ultimately, senior management sponsorship is essential for a process that could be long and expensive, but the potential upside of increased transparency and operational efficiency coupled with better risk management will likely appeal to key stakeholders and outweigh any potential downsides.

Sentance: Business stakeholders typically highlight the obvious, direct benefits of data management such as reduced data duplication, and hence reduced vendor costs; increased efficiency, through automation; improved reliability; and higher data quality. However, some of the benefits such as reduced time reconciling data are harder to quantify, particularly when they cut across departments. I remember recently some industry figures that for every \$1 of direct costs on data, there is at least another \$5 to \$10 spent on processing it, so the cost savings are there to be made. In terms of the operational challenges associated with these kinds of projects, they typically involve getting all the stakeholders involved and on-message. In our experience, it's key to ensure that all parties—front, middle and back office—are involved and that the work is undertaken with systems people who know the business well and are good communicators. Communication and clear understanding of requirements are key in my book. ■

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