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A Practical Guide on Data Initiatives for Public and Private Investments:

Establishing data governance and better data management

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EXECUTIVE SUMMARY

Data management and data quality issues have been around for as long as financial services have existed as an industry. It seems that as one challenge is solved, three more jump in to take its place – this focus has spread from listed/public securities in recent years to real estate and other private/ alternatives assets. Both are growing issues for financial services, each showing challenges to achieve better data. Sophistication for acquisition due diligence, portfolio management, security master enrichment, pricing, asset monitoring, risk exposure, performance, compliance and investor reporting have all escalated. This increase in sophistication has led to substantial increases in demand for:

- Better quality data
- More granular data
- Increased consistency in data
- Improved timeliness and synchronicity

All clients that adopt Broadridge's platforms are seeking to remain competitive with technology, and it becomes evident very quickly for many of them as they explore the value proposition of the systems they are investing in, that the data available to populate the platforms (both 3rd party and the firms transactional data) are critical components to their success.

This white paper encompasses a practical discussion using plain language guidelines for how to get data governance started in a firm. It contains challenges that summarize the most frequently asked questions from firms at the cross-roads of initiating data governance and seeking to improve data management to industry common practices in order to remain competitive going forward.

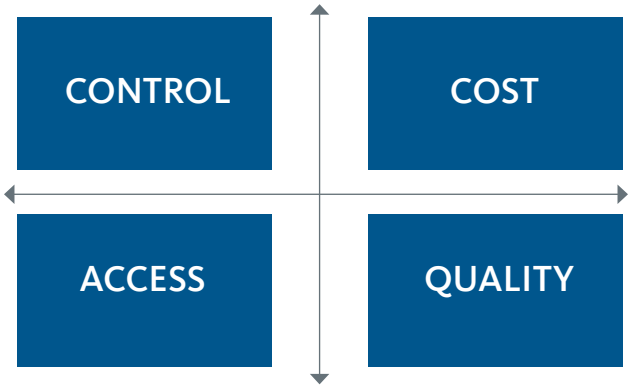
The overriding advice that straddles all these questions is "crawl, walk, run". Do not try and hit world-class data governance in the initial formation of the role. Carve out small pieces and gradually ramp up as the governance committee, rollout team and the users become more sophisticated on the topic.

What does data governance look like?

Data governance can be broken into two pieces: 1) a committee of senior resources from key departments across the firm who set the policies for consistency of approach and drive the scope, priorities and monitor progress of the firm-wide initiative; 2) a data governance execution team is comprised of operational-level resources from both business and IT areas who are charged with implementing policies of the committee, monitoring the progress/adherence to the guidelines.

DATA GOVERNANCE GOAL SYNOPISIS

Empower the business with data they can trut from external and internal sources



CBA should be highly effective value proposition on all in costs for software, interefaces, time-to-production

Highly adaptable for plug and play for data sources/destinations into production in days, not months timeframe

Data platform must have intuitive interface allowing business to directly build and monitor tolerance rules

Where should data governance reside in an organization structure?

This is a tricky question to answer, as all organizations are structured differently. The obvious answer is data governance should reside where it is most likely to succeed! Here are some of the factors that tip the scale in favour of this scenario:

- Ideally, data governance should reside in business and be dominated by end users but should have participation by IT.

- Ideally, it should be located in a business unit (not an IT unit) with enterprise-wide scope (such as compliance) that is knowledgeable of the business challenges of having poor data quality. While data governance should not be driven by IT, they must be at the table as a participating entity.

- Ideally, the data governance entity should be populated with internal resources who understand the organization's data challenges. These resources are often scattered amongst disparate business units doing 'ad-hoc data governance' (AHDG) in their operational roles – such as valuation, forecasting, analytics, and performance/risk/compliance - and they need to be harvested to one team. For most corporate cultures, this is not easy to do but the rewards to the organization are enormous. A good compromise is to get this group of individuals in AHDG roles sequestered on a temporary basis (3 to 12 months, based on the size/scope of the project) to carve out and rollout the initial data governance vision and then hand it off to less experienced resources in cross-training to support the function going forward.

- Roles and responsibilities of a data governance committee often include:

  - o Establishing data governance process
  - o Overseeing scope of external, internal and partner data
  - o Establishing tolerances and thresholds for consistency/quality
  - o Managing and reviewing efforts by data governance operational team

- Roles and responsibilities of the data governance operation team often include:

  - o Establishing data strategy and workflows
  - o Ensuring data quality and cost controls
  - o Overseeing data operations:
    - – Defining practices and responsibilities for data sets
    - – Validating quality of data and resolve discrepancies
    - – Looking for data coverage overlaps/absences
  - o Consulting with business partners (both internal and external) on data needs:
    - – Providing domain expertise to improve business
    - – Participating in SLAs and other agreements with third parties to define data expectations
    - – Documenting data requirements and business rules
    - – Ensuring good, complete quality data delivered
  - o Enabling and supporting a dynamic business model
  - o Liaising with IT for environment support
  - o Reporting back to data governance committee on activities

How do we staff? What kind of skill sets are we looking towards retaining?

This is the number one question heard from firms grappling with their first data quality and/or governance project. It is often quickly followed by, "do I hire business analysts, project managers, systems analysts?" As mentioned above, most firms have seasoned resources executing AHDG and they should be the first picks for any staffing. The second choice is to acquire staff that will be cross-trained by the AHDG for ongoing support once the data governance and management initiatives are well established.

The simple answer on staff to retain beyond the AHDGs is that you need people who "get it" – they understand the perils of bad data and the domino effect up and down the data food chain of an incorrect material piece of data. Ideally, they have strong business knowledge of financial services transaction data (i.e., not point-of-sale or address-oriented client data) and know the firm's specific operations. As an added bonus, they care about data quality and are passionate about fixing it. If they have these qualities, all other designations they may port to the role are secondary.

Conversely, if a firm hires B.A.s/PMPs with no data or firm experience, the learning curve for them to optimize their contribution to a data governance project is many months, even years. They are best suited for the cross-training role by the AHDGs people described in the previous section, not for initial adoption and rollout.

What does data management look like? Isn't that data scrubbing or creating a golden copy?

This question is not unusual and stems from an understanding of what the firm considers data management at present compared to what is the realm of concern for the data governance committee. Historically, data management focused on data capture and storage, and these were the responsibility of IT specialists. As modern data management focuses on the quality, timeliness and granularity of the data captured, different skill sets than those typically found in IT units (i.e., more business-oriented) are best deployed to effectively improve the data quality. When this question arises, it denotes the need for a strong component of education on modern data management through all levels of the organization and likely through the duration of the project.

This sounds relatively straight forward, however two challenges typically impede effective improvements to data quality, timeliness and granularity: 1) as mentioned earlier, since all data has historically been managed by IT, typically any project with the word data in it is assigned by senior management to this area, not a business area, 2) many firms assume that "data scrubbing/cleansing" (historically an IT task, particularly when looking to achieve 'golden copies' for the data warehouse) is the same task as "data quality", which confuses the issue.

In essence, modern data management builds on the core concepts of data scrubbing/cleansing. Let's define data scrubbing/cleansing as the tasks of detecting and removing/remedying data that is incomplete, formatted improperly, duplicated or bringing consistency to disparate data sets from different sources in a consolidated environment such as a data warehouse.

These are all noble tasks, but they have historically been done by IT professionals looking for completeness of data from a technical perspective with little consideration of whether it made sense or was complete from a business purpose perspective. For example, when looking at a valuation field an IT professional will ask, "is it empty or not, and does the value represent the numeric constraints for that field with 'x' number of decimal points?" A business view of the same price data will take this a step further and ask, "does the valuation make sense? How is it calculated?" This is not easily answered by an IT professional.

Data stewardship demands a partnership of skill sets between business and IT knowledge of the data sets the firm is trying to improve.

Modern data management has more sophisticated data management needs and needs to be done earlier in the data-capture process. This is pushing firms to establish policies and procedures for data cleansing that starts in business groups and is aided by IT groups based on the skill sets necessary for each component of the data management process. Where this falls off the rails is when the policies are written by business and handed to IT for execution – data stewardship demands a partnership of skill sets between business and IT knowledge of the data sets the firm is trying to improve.

The business is demanding data transparency and detail – how/where do these fit it?

There is more demand for transparency, granularity and confidence in consolidated financial numbers presentation (especially on valuation and exposure) since sub-prime showed the world that financial transactions at the surface may not resemble the same beast once the lowest-level of detail is revealed. They are core challenges for any data governance and management mandate. The two biggest challenges a data governance group must deal with in achieving transparency are:

The underlying applications (i.e., accounting, valuation, property and other physical asset managers) do not have database or security master files set-up at a low level of granularity to capture the detail once it is acquired, so there is no place to store it. This is absolutely an aspect of data governance and data management, but also one everyone is rapidly becoming acutely aware of being a challenge in all levels and roles of the business.

The definition of these new fields for granularity/ transparency, and where the specific pieces of data need to come from to be "fit for purpose", is not resolved with a data mapping initiative, often associated with data warehouse projects which are sometimes mistakenly taken as the first step (for reasons outlined below) to solve data quality issues". This is an area firms and new data governance groups often overlook or do not understand. Many firms start their data management overhaul in IT, as mentioned earlier in this document. This is often kicked off by a massive data mapping exercise. These take easily six months to two years and their effectiveness to improve data quality are mixed for the following reasons:

Data mapping is frequently done by IT subject matter experts (SMEs) looking at applications on corporately-supported systems only. These efforts rarely look at the data flows and data mapping amongst non-corporately supported applications, which includes Excel and Access. However, these systems are frequently where "granularity" is being captured and utilized to run the business.

Mapping the data amongst applications does not improve data quality. If the underlying goal is to improve data quality, spending time, effort and resources to map current state will not achieve this goal and you will produce a blueprint of where the firm is, not where it needs to go nor will it capture the data quality challenges. The "map" produced at the end often does not reflect the current state of the business, as business needs for data uses and sources is evolving too quickly.

Documenting the data needs for transparency requires the strongest domain experts, not junior business/IT resources acting as needs analysts/scribes, respectively. If a firm is savvy enough to look at future state for their data needs and reach out to the business, there is often miscommunication when inexperienced resources are charged with documenting the current challenges. Let's go through a mini-conversation to outline where improving data quality falls off the rails in this scenario:

Scenario: Middle/back office accounting person who struggles with pulling together a consolidated picture on a timely basis, especially for cash, from the various instrument types the firm deals in (private equities, real estate, mortgages, infrastructure, equities, fixed income, money market, etc). This person spends most of their time looking for, assembling and validating data rather than analysing data.

Data Mapping Resource: "What data do you need to improve data quality and reduce operational risk for your role?"

Front-Office Analyst Person: "Just get me a consolidated data repository from the accounting system(s) with our property manager's data there and I can pull extracts and build analytics and consolidated reports from there."

Conclusion and Business Needs Documented: The front office analysts need a consolidated data repository of all sources of data from which to do extracts and create reports. Rarely are there any questions in the needs analysis that involve what the work flow of the data is that the analysts run through (or anyone else). This is a fatal flaw in trying to improve data quality in an organization.

Challenges with Communication and Diagnosis: The team charged with developing a solution start to look at the databases and security master files behind the applications needed to pull together a consolidated view for the data repository. Knowing the definition behind each field name and understanding the purpose of actual contents is not the same thing. "Cash" can mean many things to many people and be hidden in various data fields defined as something entirely different. As well, the manner in which each organization calculates their definition/algorithm of cash calculations is different. Strong current state operational knowledge is critical to bringing clarity to the business, data and work flow challenges that need to be rectified.

In a simpler example, in the listed securities world, which "price" field do they map? As discussed earlier, where valuation and pricing were discussed with both a business and IT lens there are multiple definitions for price (close, bid, ask, last, etc.). How have multiple price fields been labeled in each of the databases in question? It is likely that all the data sets in question have multiple prices fields, and these are not as intuitive as necessary to accurately map like-fields across databases. This requires a dialogue with the builders and users of all the databases involved in order to properly map the accurate field contents in the consolidated data store.

What types of data should we look at under data management scrutiny?

For listed securities, enriched security master data and cohesive pricing sources are still elusive, especially on an enterprise-wide level basis. For this section, we will review private investment data needs to understand some of the nuances that affect these assets. As alternative investment firms become sophisticated in the nature of their data management, governance, policies and adoption, this will evolve. For the sake of this section, we will deal with private investments and basic data needs for the average reader. The types of data to be reviewed for alternative investments are dropped into three buckets: a) cash flow, valuation, reference and static data; b) accounting/transactional data; c) derived data.

Frequently there are "coverage" overlaps (i.e., people capturing, validating and tracking the same pieces of data independently) that can be effectively managed to eliminate duplication, reduce costs and ensure everyone is using the same set of data. This happens across all types of data for real estate and other alternative assets. The first two buckets of data (a and b) are straightforward. The challenges with derived data, however, sometimes require more understanding on the complexity.

Loosely defined, this refers to any data that is the result of calculations or algorithms managed through both corporately supported and desktop applications, and it usually involves a combination of valuation, benchmark/reference and transactional data. Many resources spend countless hours doing forensics and reverse engineering to determine why two reports relaying something as commonplace as valuation present different values.

Besides the person hours involved in these overlapping activities for data acquisition and validation, the bigger challenge in the current competitive market for new assets is turnaround time on due diligence and monitoring analytics. This is one of the biggest challenges firms are facing in the industry today and it is driving business cases for both data governance/management projects and acquisition of technology for front and middle office roles.

The sequence (valuation/reference, transactional and derived data) in which firms are likely to succeed in tackling data improvement projects is proportionately tied to the awareness of the data quality issues at the firm. The increasing level of sophistication of data governance challenges ties directly to the ongoing education and increasing awareness, which leads us to our next topic.

Are education on data quality and awareness critical components to getting modern data management established?

The resounding answer to this is yes, but it is much trickier to get resources in all areas of the business and IT to listen at the outset of any data mandate than you would think. Most people already think they are versed in what data management is all about. Many also think they have adequate controls in place that are comparable to their peers. These assumptions and preconceived notions of understanding are major roadblocks to firms improving their data quality. Demonstration by example of what data governance IS through sample projects rather than trying to educate on what it is NOT is the most effective way to increase awareness and buy-in.

Crawl, walk, run with data improvement: The sequence and scope in which firms are likely to succeed in tackling data improvement projects is proportionately tied to the awareness of the data quality issues at the firm.

The best way to combat this education barrier in the early days of a project is with outside validation. Bringing in experienced experts with data in public and private investments to discuss the business aspects of a data management strategy, the scope of modern data management and outline the concepts of data governance is most effective. External, seasoned experts can illuminate and discuss common/evolving/best practices and what a firm's competitive peers are doing. This is one of the most effective ways in which to get senior management to recognize the reason and the importance of dealing with data governance: to remain competitive. One caveat in bringing outside expertise – many experts or consulting firms espouse knowledge in data, but most experience is in data warehousing, ETL, data mapping and other legacy data handling. Ensure you retain expertise that has worked on improving the data quality and data governance, not storage or re-wiring interfaces.

Demonstration by example of what data governance IS via sample projects rather than trying to educate on what it is NOT is the most effective way to increase awareness and buy-in.

Bringing in vendors for overviews of what their products offer can also aid in this early education, but it must be tempered with some consistency of process (like an RFP process or strictly adhered to scripted demo) by which you can examine the offerings of that are available to you (as well as your peers). If not managed for specific scope of data governance and data management platform providers are brought in alongside ETL tools, data warehouse solutions, etc., this overview of the marketplace can make the scope a murkier area and not clarify what data management is and how it might be managed. All too often firms and vendors pigeon-hole themselves into thinking building a consolidated data warehouse which rarely provides improved data quality. This broader scope of review to include data warehouses can actually impede progress, so ensure only business-oriented data platform solutions are examined to learn about data governance and EDM.

A common first project for many firms is a central security master, as it is tangible for most involved, and business/operational risk reduction is easily reduced with its introduction, making business cases easy to get through proper channels. Once an initial project has been completed, the results of it can serve as an excellent case study and educational aid to promote additional data improvement project.

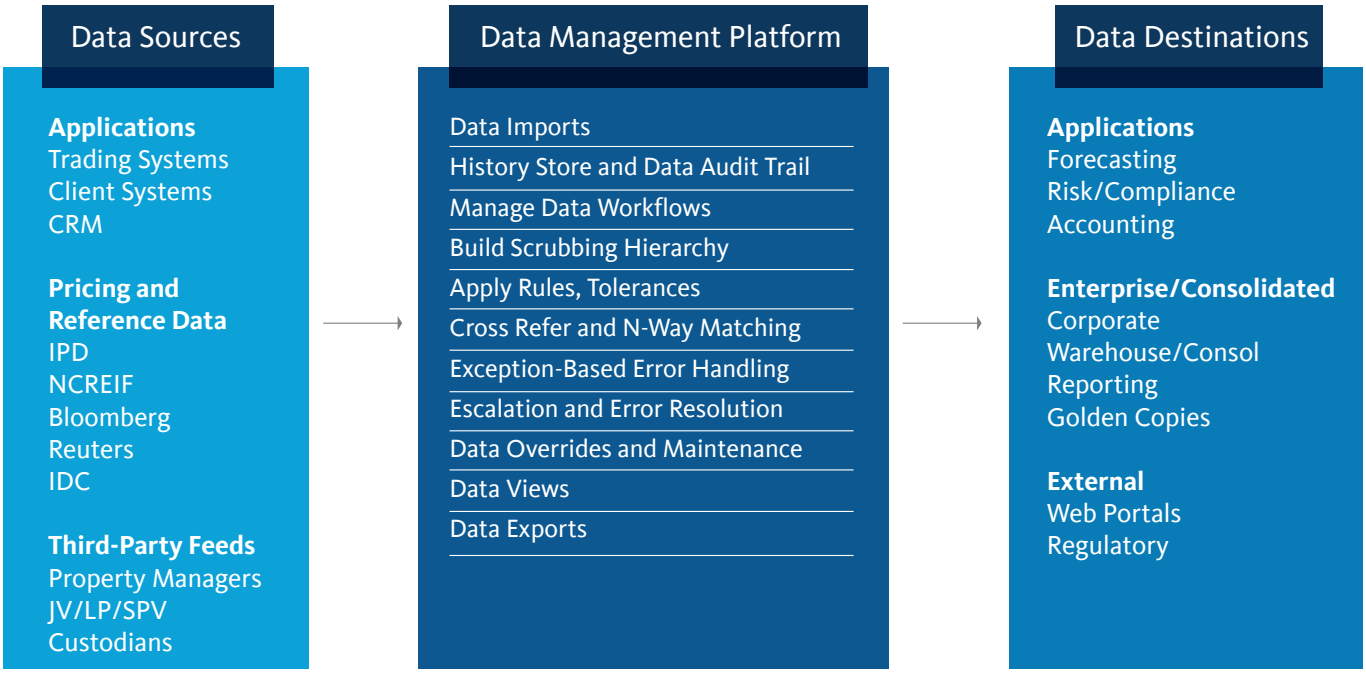
What role do data management platforms take on?

The role of the data management platforms is that they can manage BOTH the "quantitative" and the "qualitative" side of modern data management. Many firms may already have tools in place in IT for some "quantitative" data management, but they are unlikely to have anything for "qualitative" data management. As a caveat, many firms in real estate and other alternative assets many have counterparts in equity, fixed income and money market assets – looking at what they might have adopted for data management (indeed, data governance as a whole!) would be prudent.

A data management platform resides as key player in data flows. Its primary role is not as a data destination, but an integral player at various points along the data flow path. Data from outside sources is often run through the data platform before it is populated into applications (i.e., such as property manager, cash flows and externally provided accounting data). A data management platform is also utilized for internally generated data as it is moved from one application (including Excel 'applications') to another application or destination (i.e., before property manager information is integrated into forecasts or accounting data is ported to a data warehouse for general use and consumption at month/quarter end).

The role of the data management platforms is that they can manage BOTH the "quantitative" and the "qualitative" side of modern data management.

The last key point to make about these environments is that the best data management platforms are business-oriented, not IT-oriented. This is essential for effective rollout and adoption by the business groups who need to handle the "qualitative" side of modern data management.



Why are all data vendor options not equal for solving data quality issues?

Under the importance of education issues (see above), the idea of bringing in vendors as part of the education and awareness process is mentioned as an option. It is appropriate to address this common question at this point to ensure firms do not get off on the wrong track with this notion, as this good intention goes awry all too frequently when assessing data management options. Bringing vendors for casual reviews of what's in the industry for vendor solutions can frequently turn into a minefield if not managed properly. If not comparing 'apples-to-apples' for vendor solutions and being very clear about the goal of a potential solution and the specific business needs to be solved, both internally and with vendors, the process can become unwieldy, and confusing for everyone involved.

Confusion on what data management is internally at the outset of the project translates into many types of vendors being invited in for review. Frequently, suitable enterprise-wide data platform vendors are brought in alongside specialized tools (i.e., not enterprise-wide) and other data products that will not help achieve modern data management at all – such as data warehouses, EAI, ETL.

If a firm has not defined its needs (as is often the case when vendors are brought in to learn what is in the marketplace) the vendor will pitch what they know, not necessarily what you need to hear. This comparing 'apples to watermelons' approach to determining what others are doing and what the marketplace offers only makes the modern data management challenge more difficult.

A list of who to bring is for exploratory purposes will vary from firm to firm, but the following guidelines should help eliminate who is NOT appropriate:

- Are the products offered IT-oriented or are they used by business people?
- Are the bulk of the existing customers in financial services – indeed, real estate and alternative assets? Is this their core market?
- Are they data agnostic? Can they handle all types of core real estate and alternative investments data (accounting, business, static, benchmark and derived)?
- Do they have a 'plug n' play' environment for changing out sources of data quickly or are the interfaces laborious (please note: for many of these vendors the costs of integration is double or triple the application costs)?
- Are they asset agnostic? Can they handle any real estate or other alternative asset class?

Why documenting the 'actual' data flows is critical

Documenting the data flows is not the same thing as data mapping, as data mapping traditionally examines database structures between major applications. 'Actual' data flows refer to how the business works with the data, which almost always involves additional tools and gyrations in traditionally non-data mapped environments. All the "touches" of the data need to be identified to effectively improve data in an organization. These are the three major questions that need to be asked when examining "actual" data flows to identify data integrity challenges for the firm:

The purpose of modern data management is to improve the data, not force the application environment to improve as a pre-requisite to improving data.

Why is the data extracted to Excel or other applications? What do the core, corporately supported applications of the firm NOT do that requires data to be modified/manipulated outside the application?

What do end users do with the data in these extracted or non-corporately supported data environments? Do they have extended databases? Do they compare the data to other data sets? Do these resources run calculations? How do these tasks modify the data? This is essential, not only for data flows but to keep tabs on enhancements that might be necessary to core applications for long-term viability, and to understand the gap between how the corporately-supported applications actually service the business needs going forward.

What happens with this manipulated data? How is it improved? Where is the data stored (if at all)? Is any of this manipulated/modified data key to running the business for other departments, and how does it actually flow to them/get to their environments if not through the corporately-supported applications?

Knowing the 'actual' data flows does not automatically mean they must be changed, but ensuring the data quality meets the firm's standards is essential. Many firms will try and get these processes inside a corporately-supported application as a first step rather than improve the data standards, consistency and capture in the current flows. This is often a fatal flaw, as the tasks being done outside a core application frequently require application modification to change and are not insignificant to achieve. The purpose of modern data management is to improve the data, not force the application environment to improve as a pre-requisite to improving the data.

What are the key business requirements? How do we translate core business needs to terminology that both business and IT can understand?

When trying to gather business requirements, sometimes business people do not articulate their needs in a manner IT or PMO people can grasp. IT is often frustrated with trying to interpret what the business is asking for.

There are the three main areas of focus that will help ascertain the IT requirements from a business needs perspective in IT-oriented terminology:

Data Platform Requirements. Data flows and sources are constantly evolving, being added/replaced across all the business units of an organization that use data from a data platform. To handle the agility necessary for data sources for the business, data sources, tools/platforms and surrounding architecture should support the following concepts:

- These foundational architectural elements, especially the data platform, should be data agnostic (any source concept) – property manager, cash flow, benchmark, accounting and other types of data for all types of real estate and alternative investments are all handled with relative ease by the same platform.
- The data platform needs to be agile and support rapid plug 'n' play, ramp-up/ramp-down of data sources to support the rapid shift of data sources, application additions/changes and version upgrades
- The data platform should not be the bottleneck for an organization's data quality due to extended interface building challenges. Swift time to production for new feeds (days/weeks)
- Interface costs for data sources/destinations should promote value, not create a budget obstacle and cost impediment to adopting the data platform
- Data flows should be as independent as possible from application sources/destinations. The potential adoption of a data hub, data warehouse or golden copy source as part of the data platform solution cannot be bottlenecks for outflows nor should they be costly or timely to set up. Expediting in-flows of data to data stores (such as warehouses) without also having the same capacity for expedited outflows will inhibit the goals for data governance. Rather than improving data quality to the business, the project will expedite quality data to a data prison.
- Swift time to production for new feeds (days/weeks) for any of: 1) property managers, cash flows, valuations; 2) core applications, and 3) other external third parties.

Interface Requirements. The data platform tools that are adopted need to be end-user/business friendly (i.e., not programmer-oriented) to ensure easy adoption and deployment:

- The platform should have user-friendly interfaces/screens/dashboards
- The skills sets required to establish rules, modify and monitor rules and rule sets for data quality tolerances should be of a non-technical nature
- A user-friendly view of multiple sources of the same data fields for "reconciliation" is ideal
- Drill-downs to lower levels of details (such as date and time stamp) for fast identification/ resolution of data errors is essential
- Full audit trail for accountability easily accessible by end users, not driven by IT driven reports

Scope of Universe for Data. This will vary from organization to organization. The best way to define this early on is with a checklist of all applications, sources/destinations of data that exist as a starting point for discussion. Categories include:

- Applications
- Benchmark and other third party data providers
- Custodians, outsourcers and property managers
- Industry/Regulatory filing connectivity

Handing this to all business groups and asking three preliminary questions will get the firm well on its way to understanding the short-term needs, longer term scope and total potential universe scope and benefit.

Identify which sources of data they use today and are critical for early adoption, which will be needed over the long term, and which additional sources are anticipated to be required in the 2+ year horizon. As well, business units will need to identity the priority in which they would like to see each of these brought on stream under data governance and on a data platform. Lastly, business users will be required to add all other additional current and future anticipated data sources to complete this list. This will include potential short/long term changes/additions in custodians, new marketplaces that will be entered into and require localized exchange data as well as local data stores (such as Excel, Access) and non-corporately supported applications that are involved in the data flow and operational processes for data.

This above chart will help identify the scope of the project, prioritization of ramp-up, and also serve as a key tool to present to vendors to help identify which data platform solution will serve the firm's needs.

How do we assess our current state against evolving practices? Can we do a peer comparison?

Achieving data quality is partly art and partly science. The science part deals with physical database-type population and is relatively easy for both business and technical resources to understand. The art part is the more intangible side of data quality that deals with the subjective part of how good data quality is at present and what can be done to improve it.

Firms often want to know what "soft skills" questions they should ask themselves to determine where their data challenges are at present and how much opportunity there is to improve data quality, governance and synergies for data optimization. Here is a preliminary list to help inspire additional questions that will be specific to each firm's corporate culture and enterprise architecture:

- Are the business groups spending more time looking for data than analyzing it?
- Have clients and senior management raised concerns about discrepancies in report(s) data?
- Are investment managers frustrated by conflicting positions reports?
- Are multiple business groups downloading similar cash flows, benchmarks and other key industry data?
- Are the same valuation and/or reference data being paid for multiple times by different groups?
- Are BI tools, dashboards and business-friendly data drill-down environments/on-line reports rendered ineffective due to data gaps and presentation consistency issues?
- Is data treated as a corporate resource at the enterprise-wide level?
- Are data issues driven by the business or are they seen as the responsibility of IT?
- Data governance is dedicated role with seasoned resources, policies, procedures and monitoring?
- Does the business feel empowered and confident with data available to them at present?
- Is the organization is pro-active in executing tolerance checks on data for quality before it is populated to business applications?

Achieving consistency in financial info presentation and data sets, both internally and externally with managers, clients and property managers, will be more important and harder to do than technology.

Even before these and similar questions are asked, firms are often looking for a high-level "line in the sand" of where they think they reside compared to their peers and the rest of financial services as a whole. The following is a brief chart that will aid in assessing the 'barometer' of what the current state might be.

An important item to note before venturing off into the firm and proclaiming what the "line in the sand" is firm-wide, is to acknowledge those areas that might be pioneers in either leading edge or industry leaders before labeling everything and everyone as trailing edge. Not acknowledging the areas striving for better data quality and governance will not help endear these data-seasoned skill sets to buy into the firm-wide project:

Trailing Edge	Leading Edge	Industry Leaders
• Decentralized • Oversight by IT • Data silos • Inconsistent processes • Duplication • Business unaware of cost of bad, inconsistent, and incomplete data • Few if any policies on data quality tolerance	• Migration to single source collection/dissemination of core data • Shift to business oversight • Data goverance established • Data management tools adopted/upgraded • Policies adopted for data quality, completeness • Data sources mapped and overlaps identified • Pricing and reference data targeted for improvement	• Data viewed as key corporate resource • Data sources optimized, overlaps eliminated, costs reduced • Migration to 'industry standards' • Cheif Data Officer role evolving with enterprize-wide rollout • Expansion of governance to all types of transactional, derived and other data

We've tried to get projects like this approved before – how do you write a winning business case for data governance and quality improvement projects?

One of the most frustrating aspects of trying to get a data governance project off the ground is getting the business case approved. Senior management will always ask (or should always ask!), "what is the business purpose?" for any project requesting funds, but it is often difficult for people presenting a business case on data improvements to have satisfactory answers. Some of the key business drivers supporting business cases for data strategy and robust data management adoption practices are as follows:

- Create better accountability
- Empower business with quality data
- Eliminate redundancy
- Provide better integration of data
- Reduce reconciliation requirements
- Improve data quality and reliability
- Centralize data and data control
- Increase efficiencies and system capacity
- Streamline & standardize source data contracts
- Reduce costs (especially on hidden business costs of validating data multiple)

Emphasis in the business case the need for the project to be driven by the business and enabled by IT, not the other way around.

What's the next big wave in data management? Oh wait, it's already here!

Many new entrants to modern data management for both public and private investments are struggling to keep up with change in data approach, attitude, usage and demands for details may be surprised by how rapidly data management is becoming a critical issue to remain competitive.

The accelerated entrance into real estate and other alternative assets have demand exceeding supply, as an example that affects all transactions. The need to execute due diligence on potential investments as expeditiously as possible (to not miss out on potential investments) has reduced the time allowable for executing the due diligence. For many firms a significant part of the due diligence is in gathering and validating the data before analysis and this is a key focus of data management for real estate, listed securities and other alternative assets. The other key business driver for data management is the granularity and cohesiveness firms are driving to achieve for reporting to their clients. As many are trying to learn and understand expansion into new asset classes, receiving detailed and transparent reporting has become an offering that is building a competitive edge for some firms and this trend will continue.

At a more general level for data management trends, we are beginning to see an increased focus for business cases and ROI for data governance and data management initiatives. In turn, we will begin to see a growth of data management being measured and data governance committees auditing and being audited for success going forward.

Many firms are tackling more exotic holdings beyond public securities, including real assets such as private equity, infrastructure, renewable resources, etc.). Even amongst traditional private investments, firms are dealing with extended data sets and derived data calculations/end results for consistency and quality amongst analytic functions such as due diligence, monitoring, risk, compliance and performance. Here are some of the areas that leading-edge data improvement team as are working on:

- Data sets related to benchmarks for all types of public and private investments
- Infusing data quality and integrity checks on non-corporately supported data sets, such as those in Excel/Access and non-corporately supported desktop tools supporting the business
- Fine tuning third party property manager, valuation, partnership data management
- Optimization of third party vendor data services and SLAs, especially on specialized data needs
- Deep dive due diligence on potential new partner/deal data by comparing data quality and set-up of potential partners to internal standards and quality tolerances

Summary

People who have worked in other industries before moving to financial services are always astounded at how challenged the data quality is in this industry. Like many other sectors of financial services, both the treatment of private investments and listed securities such as equities as a corporate resource, not the property of the end-users, and is rising on the priority scale faster than most solutions are capable to address the challenges posed by seeking better quality data.

Data governance and data management are becoming an industry-recognized discipline for financial services and is in its infancy for both public and private securities. To really advance data quality in an organization, however, the perception that data is an IT issue must be eliminated and the 'glass ceiling' between business and IT must be broken, so cooperation is instilled to take data quality to the next level.

Public and private investment management is changing rapidly and moving into levels of sophistication, accelerated turnaround times and regulatory compliance (like AIFMD, MIFID2, DOL, T+2) like never before experienced in the industry. Data governance and better data management to support robust front and middle office functionality will help define the competitive firms in the all types of public and private investment assets space in the coming years.

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