waters

trading technologies for financial-market professionals

Investment Book of Record

Special Report

Sponsored by:

Bloomberg AIM

DST

EAGLE INVESTMENT SYSTEMS

SimCorp

SUNGARD®

Editor-in-Chief Victor Anderson
victor.anderson@incisivemedia.com
tel: +44 (0) 20 7316 9090
US Editor Anthony Malakian
anthony.malakian@incisivemedia.com
Deputy Editor, Sell Side James Rundle
james.rundle@incisivemedia.com
US Staff Writer Jake Thomases
jacob.thomases@incisivemedia.com
US Staff Writer Tim Bourgaize Murray
timothy.murray@incisivemedia.com
European Staff Writer Marina Daras
marina.daras@incisivemedia.com
Head of Editorial Operations Elina Patler
elina.patler@incisivemedia.com

Contributors
Max Bowie, Editor, Inside Market Data
Michael Shashoua, Editor, Inside Reference Data

Global Commercial Director Jo Webb
jo.webb@incisivemedia.com
tel: +44 (0) 20 7316 9474
US Commercial Manager Bene Archbold
bene.archbold@incisivemedia.com
US Business Development Executive Joseph Donato
joseph.donato@incisivemedia.com
Business Development Executive Shayna Hersh
shayna.hersh@incisivemedia.com
Account Manager Tom Riley
tom.riley@incisivemedia.com
Senior Marketing Manager Claire Light
claire.light@incisivemedia.com
Marketing Manager Natasha Gordon-Douglas
natasha.gordon-douglas@incisivemedia.com
Design Lisa Ling
lisa.ling@incisivemedia.com

Multiple Subscriptions/Site Licences
Monazer Rashid tel: +44 (0)20 7316 9606 (UK)
Andre Anderson tel: +1 646-736-1870 (US)

Subscription Sales
Hussein Shirwa tel: +44 (0)20 7004 7477 (UK)
Dennis Bond tel: +1 646 755 7374 (US)
waters.subscriptions@incisivemedia.com

Group Publishing Director Lee Hartt
Chief Executive Tim Weller
Managing Director John Barnes

Incisive Media Head Office
32-34 Broadwick Street
London W1A 2HG,
tel: +44 (0)20 7316 9000

Incisive Media US
55 Broad Street, 22nd Floor
New York, NY 10004
tel: +1 646 736 1888

Incisive Media Asia
14th Floor (Unit 1401-3)
Devon House, Taikoo Place
979 King's Road Quarry Bay
Hong Kong
tel: +852 3411 4888

Incisive Media Customer Services
Haymarket House
28–29 Haymarket
London SW1Y 4RX
tel (UK): +44 0870 240 8859 (UK)
tel: +44 (0)1858 438421 (International)

Waters (ISSN 1068-5863) is published monthly (12 times a year) by Incisive Media. Printed in the UK by Wyndeham Grange, Southwick, West Sussex.

IBOR to the Fore

From a buy-side perspective, no business process or trend has garnered more interest over the past 12 months than the investment book of record (IBOR). And while the IBOR moniker might not be all that familiar to every capital markets practitioner, given its relatively recent addition to the industry's lexicon, it represents little more than the formalization of a catch-all term used to describe the process by which asset management firms extrapolate well-defined, reliable and transparent start and end points for the portfolios under their purview, allowing them to monitor and ascertain positions on an intra-day basis and by so doing, making more judicious investment decisions. That might be a bit of a mouthful, but the fixation with accurately monitoring the "health" of individual portfolios has been around for years—it's just that now, buy-side firms have the necessary technology and operational expertise to make this aspiration a reality.

But like so many other processes across the buy side, IBOR projects can be notoriously taxing in terms of complexity, the timeframes needed to complete such undertakings, and the budgetary commitments required to ensure that they aren't just pie-in-the-sky projects that fall by the wayside due to scope-creep, underfunding, and technical ineptitude. Make no mistake, the sheer quantity and level of detail underpinning the inter-application "plumbing" which allows disparate parts of the business to seamlessly feed through IBOR-influencing data and contribute to its overall mosaic, is not for the fainthearted.

The Q&A section of this special report, which starts on page four, is similarly not for the fainthearted: It's all of eight pages long and represents more than a little light reading on the subject. But it also contains some fascinating insights from four technology vendors in this space—Bloomberg, SunGard, DST Global Solutions, and Eagle Investment Systems—and two well-established asset managers—Chicago-based BMO Asset Management and M&G Investment Management, based in London—on the operational and technology challenges facing buy-side firms as they grapple with how best to go about producing such reports on an on-going basis. As previously mentioned, the IBOR road is likely to be a rocky one, although, as all our respondents agree, the business benefits that can be realized on the back of such projects, are far too valuable to ignore. ■

Victor Anderson
Editor-in-Chief

Linedata Launches I-BOR Solution

Paris-based buy-side technology vendor Linedata has launched I-BOR, an investment book of record (IBOR) solution, to answer the increasing demand from its client base to establish an independent and granular view of their investment positions.

According to the vendor, Linedata I-BOR presents start-of-day and intra-day views of positions and cash, aggregating multiple data sources across buy-side firms to support risk and investment management as well as reporting activities.

"Linedata I-BOR can deliver a variety of views on positions depending on what the needs are and which business functions you are trying to fulfill—whether it is trading or risk or performance," says Paul Westgate, product manager at Linedata.

Acting as a unifying layer, an IBOR platform can help firms pull data into one place before disseminating it across different divisions, helping the firm generate a complete view of its positions.

"After perhaps several mergers and consolidations, some companies have inherited multiple back-office systems and their data is fragmented across the organization," Westgate explains. "Other companies have outsourced their back-office functions and are vulnerable to some extent because they no longer have in-house records. It has become very important for all asset managers to have access to a consolidated and independent set of records that they control and which they can reconcile to their service providers."

As neither the trading book of record (TBOR) nor the accounting book of record (ABOR) can capture all events, firms are left with incomplete and disparate data feeding their risk and performance systems. With the rise of regulations and multiple budget restrictions, IBOR solutions have become much sought-after tools, especially for buy-side firms, helping them consolidate all their data in one place before spreading it across the different divisions.

"Linedata already has that capability as part of the Icon system. With our I-BOR solution, we have picked elements from the Icon engine and we've repackaged them as a different entity focused around position-keeping for securities and cash, and valuation," adds Westgate.

The vendor announced that it will be further developing the IBOR platform in order to offer it to a wider audience.

BlueBay AM Live on SimCorp Dimension

London-based BlueBay Asset Management, which manages $53.9 billion, will use SimCorp Dimension for trade processing, derivatives clearing, investment book of record (IBOR), fund valuation, investment accounting, data and collateral management.

Dimension will support BlueBay's business lines covering a range of fixed-income-based asset classes, replacing several legacy IT systems as a result.

"Since our launch in 2001 and subsequent acquisition by Royal Bank of Canada, our business has grown rapidly, and to achieve future ambitions we need a flexible and scalable platform that can support in areas such as derivatives processing and collateral management, and which can grow with us. That and SimCorp's track record of successful implementations with asset managers were the important deciding factors," says Simon Lumsdon, global head of technology for BlueBay.

Electra, Eagle Form Strategic Alliance

Software provider Electra Information Systems is partnering with Eagle Investment Systems. Through the alliance, three of Electra's solutions will be made directly available to Eagle's buy-side clients.

Ian Danic, executive director at Electra, says the two vendors are building off a long-standing relationship that laid the groundwork for the recent pairing. In one example, Electra tapped Eagle's services for data collection to fulfill its clients' needs in the past. For this latest, and broader, agreement, Eagle customers will now have access to Electra's RecCollect DataPIPE, Quantum and Action offerings.

"Eagle expressed an interest in introducing our fee-billing and trade-notification systems," Danic says. "Having already tested those solutions with several mutual clients, we developed a more systematic approach through our alliance with Eagle. The agreement provides us with direct access to a wider pool of the buy side and expands Electra's global footprint, as Eagle has established offices in a variety of the key market hubs where we aren't. As we've recently opened Electra's London office, Eagle was the right firm to align ourselves with, given their industry reach and reputation in the buy-side marketplace."


Ian Danic, Electra

RecCollect provides data for securities, cash positions and transaction information for more than 450 global custodians, brokers and sub-advisors, while Quantum is Electra's fee-billing and revenue-management solution for fee calculation, invoicing and accounting.

Action, the third piece of the vendors' mutual cooperation, is a post-trade automated tool kit for custodian trade and client notifications, confirmations and affirmations, and settlement instructions.

Does Your IBOR Meet the Challenge?

Whether you put an A, I, M, or T before the BOR, how a buy-side firm organizes its books of record has become more complex, yet more important than ever. The success of money management firms today is contingent on their ability to make informed decisions based on high-quality, real-time and predicted position data across all assets. They need to know what assets they own, what they are worth, and what their exposure is, at all times.

So, where to begin? This quick and easy checklist will quickly reveal if your firm has all of the investment book of record (IBOR) bases covered. It is also a guide if your firm is seeking to implement an IBOR. The three key requirements of an IBOR are that it can capture, calculate and disseminate.

Capture:

- All instruments in your portfolio
- All position drivers such as trades, corporate actions, redemptions/subscriptions, stock-lending, fees and taxes, and both stock and cash collateral
- Positions as well as transactions
- All the data formats exported by other systems such as XML, comma-separated values (CSV), Swift and FIX
- Multiple transport mechanisms such as enterprise service buses (ESBs), messaging, web services, FTF, files and databases

Calculate:

- Positions automatically without human intervention
- Include all the position drivers
- Past, present and future positions
- Cash as well as stock
- On-demand, intra-day or near real-time 24/7, not just end-of- day batch
- **Position customized to individuals' requirements include:**
    - What status transactions are included
    - Are orders included?
    - Valuation scenarios
    - Simulated and forecast transactions
    - Cash reinvestment assumptions

Disseminate:

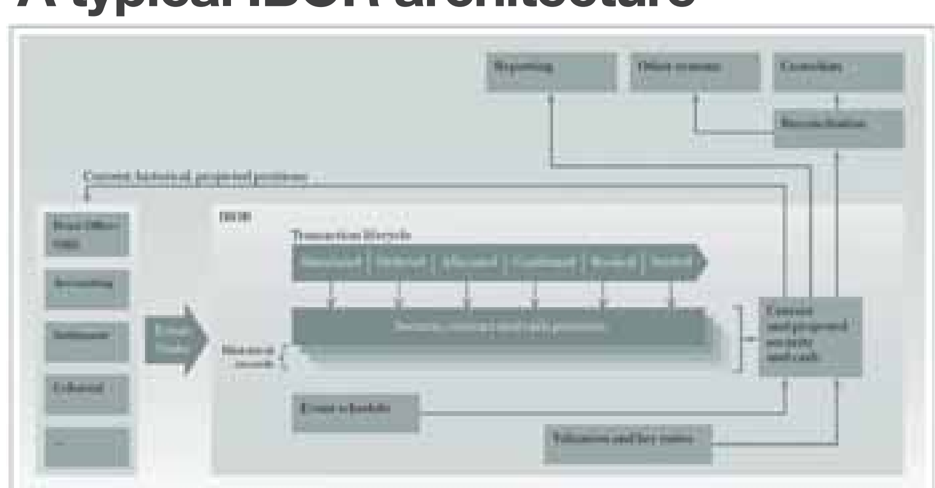
- **To the user:**
    - Easy-to-use IBOR browser to allow investigation and drill-down in multiple scenarios
- **To other systems:**
    - Front office
    - Back office
    - Risk
    - Performance attribution
    - Compliance

The IBOR should reside in a single database, optimized to support front-to-back-office processing in the transaction lifecycle. It should act as an aggregation point for information that is within or outside of the organization. The reality today is that most firms have siloed information stacks, numerous accounting systems, even multiple order management systems (OMSs). This all creates dangerous redundancies and makes aggregation to a single source of the truth that much more important.

Today, it is irreducible that the technology exists to support an IBOR. Many organizations have suffered because of disparate information, legacy systems, trying to aggregate data, or attempting to do it on their own through data warehousing. Many leading firms are finding that a better approach is to look at modern unified solutions, like SimCorp Dimension, which provide a flexible and configurable book of records with centralized position-keeping across all events for all assets for improved data quality, timeliness and accessibility. SimCorp Dimension is designed to handle all position drivers across all instruments and has the data repository and tools to do so today.

The investment book of record is a transformational mechanism, enabling firms to "insulate" and "turn off" legacy applications product-by-product, or strategy-by-strategy in the process. It can also be a major agent of change within a firm in terms of alpha generation, regulatory compliance, and risk management. Realizing the necessity of having a single source of the truth, buy-side firms are increasingly adopting IBORs, and stakeholders across the front-, middle- and back-office, to say nothing of clients, are benefiting handsomely from the change.

A typical IBOR architecture



Rising to the Challenge

Building and maintaining an investment book of record is no mean feat for buy-side firms with the necessary budgetary clout and technical nous to embark on such initiatives. And while the business and operational benefits of such projects might be enticing, they are not without their challenges.

Q What are the drawbacks associated with calculating start-of-day portfolio positions based on accounting book of record (ABOR) data as opposed to investment book of record (IBOR) information?

Tony Warren, vice president, product management, SunGard Asset Management: The main drawback with using the accounting book of record to calculate start-of-day portfolio positions is that the portfolio manager is without the most accurate, real-time view of traded positions. The ABOR is used primarily to drive the net-asset value (NAV) of the portfolio. What makes the NAV-based ABOR a less reliable measure for start-of-day positions has to do with the publication of the NAV. While the rules vary, the effective date of transactions can either be trade date (T) or, more commonly, trade date plus one day (T+1). In many markets, the NAV is based on an intra-day valuation where the transactions can be included as T up to the valuation point and T+1 thereafter, making it difficult to create a true end-of-day view of the portfolio from ABOR. Historically, this has led firms to maintain a separate portfolio to create an IBOR, causing duplication of work and the risks associated with additional reconciliation.

SUNGARD®

Tony Warren

Vice President, Product Management
SunGard Asset Management
Tel: +44 20 8081 2288
Email: tony.warren@sungard.com
Web: www.sungard.com/assetarenainvestone

M&G Investment Management: IBOR at M&G is wider than investment—it applies to the management of position data, irrespective of the purpose or the user. It is a fallacy that there is "one true position," and searching for it is fruitless. We need to accept that there are different views of positions, which are appropriate for different purposes and different users, and that these may have differing levels of certainty. Position data is built from a series of impacts/transactions, which are uncertain to some extent. Even a position impact, which has resolved into a bank/custodian position, is subject to post-settlement adjustment. Saying "just get it right," is naïve and unhelpful. We need to allow the position-data user (or consuming application) to specify the scope, timing, assumptions and level of certainty of the position data they require from IBOR, and then provide that to them quickly and efficiently.

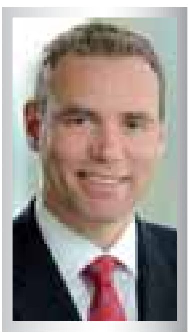
ABOR data reflects the state of position impacts when they have been posted to accounting.

Exactly when that posting occurs depends on user-specific accounting rules, but they will be a set of accruals of some form. Generally, the impacting transactions will have reached a state of certainty where there is a contractual right and/or obligation associated with them. They are then posted to the accounts, and therefore the positions, which result from them, appear in ABOR. This makes accounting views essentially retrospective—they reflect what has been posted, but not what has happened/is going to happen, but hasn't yet been posted.

In constructing a start-of-day position, asset managers augment their end-of-day accounting positions by adding some further impacts in their overnight batch process. This enriches ABOR with some known but unposted transactions, including the impacts of some corporate actions and income events. It is generally a very partial enrichment, which seeks to hit the most important impacts, but does not try to achieve completeness. It is also constrained by the scale and performance of the overnight batch process: Many managers suffer from overweight, fragile overnight batch processes, which make the timing of front-office start-of-day something of a lottery. We need to get away from this dependency.

Intra-day, the start-of-day position is updated, usually in the order management system (OMS), to take account of intra-day trading activity. This is helpful, but again is a very partial update. There are multiple event types that impact positions, and trades are just one of them. The fact that the intra-day update is so partial means that the real-time position data it delivers is of limited value—it is usually thrown away and repopulated from scratch at the start of the next day. It can't be used for reconciliation, or as a continuing real-time record, precisely because it misses out such a high proportion of position impacts.

> "One direct implication of having a reliable IBOR is that when managers have robust starting and ending points for their portfolios with full disclosure on positions and associated cash flows, they can make knowledgeable investment decisions. These positions are inclusive of many activities occurring in the back office on a daily basis, such as fully reconciled cash and positions adjusted for current-day corporate-actions activity. IBOR should combine these activities with the full day's trading activities (based on T). Then the IBOR data can be made available for start-of-day, end-of-day and intra-day snapshots." **Tony Warren, SunGard**



Bloomberg AIM

Dan Matthies
Global Head of Asset and Investment Manager (AIM)
Bloomberg
Tel: +1 212 318 2000
Web: www.bloomberg.com

So overall, if you were to stand in a court of law and explain honestly to a judge how an intra-day position is constructed, you would have to say: "It is a partial, real-time update of a partially enriched retrospective overnight accounting view." That is a very weak statement and is the problem with accounting-derived positions.

Dan Matthies, global head of Asset and Investment Manager (AIM), Bloomberg: The most obvious drawback is timeliness. An ABOR that creates a start-of-day position involves potential issues arising from delays. Equally critical is that this creates an inconsistent process model that relies on a single point of reference for the supposed accuracy of a position. Thus, the dependencies and inconsistencies in the process underlying the ABOR are inherited and possibly magnified by the investment manager. Data may be deemed accurate enough for the ABOR but it certainly is not accurate enough for a portfolio manager to make well-grounded investment decisions in a fast-moving, complex market environment.

> "The advantage of working within an IBOR framework is reliability. Removing the dependencies and constraints of an ABOR model results in the IBOR assuming responsibility for the timeliness and accuracy of data provided to asset and investment managers. The IBOR framework reduces the operational risk underlying the investment manager's decision support. In addition, the other advantage is that a properly implemented IBOR model allows decision-makers to move away from the whole concept of 'start-of-day' as the only point for reliable information." **Dan Matthies, Bloomberg**

Todd Healy, head of investment operations, BMO Asset Management Corp.: In order to answer the following questions, it is first important to establish a common understanding of what the ABOR, TBOR and IBOR mean, since these terms are not always applied consistently in the industry.

ABOR—The accounting book of record, which is typically tied to the back-office accounting system for end-of-day positions and historical transactions.

TBOR—The trading book of record, which is typically tied to the front-office OMS and refreshed every morning from the ABOR. These normally do not track all the potential position-moving transactions such as margin calls and redemptions.

IBOR—Investment book of record, which centralizes intra-day positions across all asset classes. It is also the centralized repository of financial calculations such as key ratios, market values, and so on.

The IBOR should be thought of as a "service" of delivering qualified positions (and underlying transactions) to the front, middle and back office. The premise of "intra-day" centralized positions means, accurate, consistent, real-time position data across all asset classes. This should include positions on both those transactions that are pending as well as those that are confirmed to allow front-to-back office personnel to make decisions based on the most up-to-date and accurate position data. It is also not just current positions (including cash) but predicted positions going forward, using known or assumed future position moving transactions, such as corporate actions or re-investment for short-dated instruments. This is important for the front office to make the best investment decisions, risk managers to derive the most accurate exposure calculations, and the back office to report accurately on the firm's current and future state of liquidity, cash, and collateral positions. Therefore, there are many consumers of the IBOR "service" in the investment management value chain. The IBOR has significant relevance for buy-side firms that operate across multiple regions/time zones with a single, global operating model. Start-of-day in the US, for example, would be end-of-day in Europe, therefore escalating the importance of intra-day positions at global buy-side firms.

Given the above definition, the most distinct disadvantage would the ABOR's inability to provide intra-day positions for up-to-the-moment data to optimize investment decisions. ABOR is often a formal, end-of-day batch process, focused on accounting precision and certainty of transactions and not on timeliness. Many firms have struggled to evolve from settlement date accounting to trade date accounting with their ABOR structure, let alone move to intra-day. IBOR, on the other hand, needs to cover "uncertain" transactions such as open orders and unconfirmed trades, and needs to be up-to-date rather than hours, days or even weeks in arrears. Also, IBOR positions need to be tailored to consumers' individual requirements—e.g., what is classified as cash—whereas ABOR normally gives just an accounting, principles-based historical view.

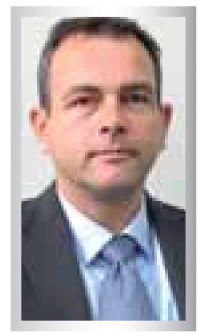
Mal Cullen, managing director, head of Americas and Eagle ACCESS: Calculating ABOR provides summary accounting information that reports holdings without the level of detail necessary for decision support, while IBOR offers total, consolidated holdings including granular detail to provide information for decision support, compliance, exposure, risk, and more. With ABOR, firms need to reconcile back to the original source because they are creating new data, and they lose granularity for asset classes where the accounting system can't support the level of detail. ABOR does not provide the detail that is critical to the investment decision process.

Julian Webb, global head of data management and analytics, DST Global Solutions: The key drawback is that start-of-day portfolio positions based on ABOR data will not fully reflect all of the known information at the start of day. This means investment decisions may be made based on incomplete or inaccurate information. The ABOR is typically generated on a batch basis at the end of the trading day. If this is used to calculate start-of-day positions, those positions will not reflect late or overnight adjustments. Examples of these changes could include trade corrections, corporate actions and cash contributions or withdrawals. The situation is worsened if the ABOR is generated on a T+1 basis as it is for many mutual funds.

An IBOR is continuously updated and can therefore provide start-of-day positions that are updated to take into account all known events affecting positions at that point in time. A further benefit of using IBOR as the source of position data is that it should be able to provide multiple views of positions according to the different stages of the trade lifecycle such as orders, confirmed trades and settled trades. Investment accounting systems that are responsible for providing the ABOR typically only hold positions in a contracted state.

Q What are the business advantages of generating and working from reliable, consolidated IBOR information at the start of the trading day?

M&G Investment Management: Managers want to plan rebalances and strategies, and need to have the most complete view of their "going-in" positions to support that. IBOR gives us a way of satisfying that demand systematically, without scratchpads, workarounds and tactical systems. Index managers want very accurate, timely views of invested positions and cash, as any inaccuracies lead to over- or under-investment, and directly incur tracking error. Accurate, timely position data is thus a direct driver of achievable performance. Again, IBOR gives us a way of satisfying that demand systematically. Treasury managers want accurate, complete forecasts of cash positions for short-term settlement cover and long-term deposit management. IBOR can deliver this without the need for a separate treasury forecasting platform. However, it is not just managers and dealers who will benefit from IBOR—marketing, performance, client reporting and business intelligence have a strong interest in the consistency of position data, and in particular, in the consistency of position history. Because IBOR is targeted at the management of all position data, and not just on positions for investment purposes, it gives us the mechanism to deliver that consistency. This will allow us to manage awkward factors, like late adjustments, without the need for manual intervention.



Julian Webb

Global Head of Data Management and Analytics
DST Global Solutions
Web: www.dstglobalsolutions.com

Strategically, the business will benefit from greater control over, and greater independence from, service providers. We expect to be able to manage the quality of data exchanged with service providers, rather than being dependent on them for maintenance of our prime records. A corollary of this is that changing between service providers could become a lower risk activity, particularly if standardization of IBOR messaging is successful. Some approaches, promoted in the market as "IBOR" solutions, propose to deliver consistency, based on a single front-to-back database, or on a limited number of reconciled position views. We can deliver consistency from IBOR across diverse, user-defined position views, because we will maintain a quality-managed time-series of position impacts. Each of these will have its own life cycle in which it moves from less to more certain over time. This time-series contains everything we know about past, current, and future position impacts, and will allow us to construct diverse views, including forecasts, current snapshots and as-of reconstructions, while maintaining absolute consistency. IBOR will be the single, central source of position data for all of our consuming applications, so this consistent position data will be common across the business.

EAGLE INVESTMENT SYSTEMS

Mal Cullen

Managing Director, Head of Americas
Eagle ACCESS
Tel: +1 860 561 4602
Web: www.eagleinvsys.com

Matthies: The advantage of working within an IBOR framework is reliability. Removing the dependencies and constraints of an ABOR model results in the IBOR assuming responsibility for the timeliness and accuracy of data provided to asset and investment managers. The IBOR framework reduces the operational risk underlying the investment manager's decision support. In addition, the other advantage is that a properly implemented IBOR model allows decision-makers to move away from the whole concept of "start-of-day" as the only point for reliable information.

Webb: Most importantly, the IBOR should have all of the known information affecting positions at the start of the day, so all end-users and systems consuming IBOR position data have the benefit of complete and accurate information at the start of day. The IBOR should be updated on an intra-day basis as well so that position data is updated to reflect all trading, operations and market events. The business drivers for implementing an IBOR at the firms we speak to vary. The key advantages that we see from IBOR include improved investment decision-making, more effective cash management, improved client servicing, and better risk management.

The main applications of IBOR are:

• Delivering better information to the front office—In order to make good investment decisions, investment professionals need to know their current and forecast cash and stock positions at start of day and intra-day.

• Better risk and compliance management—Being able to monitor market and counterparty exposure intra-day on an aggregated basis is increasingly important.

• Reporting—Both internal and client reporting is increasingly granular and exacting. High turnaround speed in the delivery of information to significant clients as well as distribution channels is also expected. Being able to rapidly produce and provide meaningful current information to management and clients increasingly requires IBOR.

• Operational—Where firms have outsourced to one or more providers, they risk not knowing whether their outsourcer is meeting their service-level agreements (SLAs) or what their positions are in event of failure at the outsourcer. Having an IBOR can act as an insulation layer for that and allows the firm to change outsourcers more easily, preventing lock-in to a single provider.

> "Some suggest that you can generate intra-day IBOR snapshots from a single system. Because many firms have multiple trading and accounting systems and are managing their assets by class, type, or region, it is likely that they could generate IBOR snapshots by class, but not necessarily across the entire book of business. As such, the argument could be made that this could not be defined as a true IBOR. Having real-time information or multiple intra-day or regional IBORs is feasible with real-time accounting, supplemented by sophisticated data integration and data management tools."
> **Mal Cullen, Eagle Investment Systems**

Cullen: There are many advantages. When working with a reliable, consolidated IBOR, firms can effectively calculate exposure and look through derivatives to gain an indirect and direct view of the exposure. Coupled with granular detail, firms are provided with the information necessary to make the best investment decision, adhere to compliance, and enhance risk management practices.

Warren: Nothing is as important to a portfolio manager as knowing exactly what he or she is managing at any given time. High-quality, reliable position data is critical for investment decision-making, so the advantages would be in the knowing—knowing exactly what you own, what it is worth, understanding your exposure, cash position and every minute detail that goes into making savvy decisions, maintaining control, keeping risk at bay, and ultimately driving performance.

Healy: The greatest business advantage is that the IBOR provides the most-up-to-date position data to drive better portfolio and trading decisions. Without an IBOR system, the front office must either work off partial and out-of-date data, or produce IBOR figures manually, which can be time-consuming, lead to portfolios not being ready to trade when markets open, and an inefficient use of highly skilled and expensive alpha producers' time. Other systems also benefit from the same high-quality position data, which previously they would have to do without or calculate themselves, thus improving quality, consistency, timeliness, and efficiency.

Q What are the direct implications of having such information available? Is it possible to generate intra-day IBOR snapshots during the course of the trading day?

Cullen: Some commentators and vendors suggest that you can generate intra-day IBOR snapshots from a single system. Because many firms have multiple trading and accounting systems and are managing their assets by class, type, or region, it is likely that they could generate IBOR snapshots by class, but not necessarily across the entire book of business. As such, the argument could be made that this could not be defined as a true IBOR. Having real-time information or multiple intra-day or regional IBORs is feasible with real-time accounting, supplemented by sophisticated data integration and data management tools. The combination of this best-of-breed approach allows asset owners and asset managers to gain a true consolidated view of their assets.

Matthies: Having reliable information available throughout the trading day improves the quality of decision making, reduces the risk of error, and allows for a reorganization of business and technology processes for greater alignment with each day's investment and operations. Intra-day IBOR snapshots are possible if sufficient business commitment is made and if they can be supported by a solid technological framework.

Healy: The IBOR allows the front office to make the best investment decisions, risk managers to derive the most accurate exposure calculations, and the back office to report accurately on the firm's state of liquidity, cash, and collateral positions. The IBOR allows front-to-back office personnel to work off an up-to-the moment, common set of positions, customized to their individual preferences and requirements. Yes, it is possible and highly desirable to generate IBOR snapshots on demand throughout the course of the trading day. SimCorp Dimension is an example of a system that is capable of fulfilling this IBOR service.

Webb: Yes, it is possible to generate intra-day IBOR snapshots during the course of the day. Ideally, the IBOR would be continuously updated through the day and position data made available on demand in near-real time to any end-user or system that needs it. Clearly, for many firms, their system architectures and operational processes are some way off being able to do that. We see many firms wanting to move from their current situation where data is largely generated on a batch basis at the end of day. An IBOR that is updated on a snapshot basis intra-day presents an easier migration than moving to a continuously updated view. However, we expect firms to seek to future-proof themselves to some extent by selecting IBOR solutions with continuous-processing capability that are separate from their accounting and order management platforms.

Warren: One direct implication of having a reliable IBOR is that when managers have robust starting and ending points for their portfolios, with full disclosure on positions and associated cash flows, they can make knowledgeable investment decisions. It's important to note that these positions are inclusive of many activities occurring in the back office on a daily basis, such as fully reconciled cash and positions adjusted for current-day corporate-actions activity. IBOR should combine these activities with the full day's trading activities (based on T). Then the IBOR data can be made available for start-of-day, end-of-day and intra-day snapshots. This allows the middle office to provide near real-time portfolio views directly from the IBOR data set.

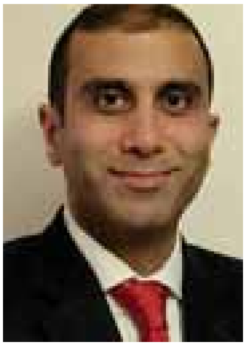
Q What are the operational and technological challenges associated with producing timely and reliable daily IBOR information?

Healy: For investment managers that operate in a disparate system landscape with no real-time consolidated positioning-keeping, producing the IBOR is close to impossible. Data warehouses do not solve this problem because of the latency involved in data accessibility and the lack of centralization of important portfolio calculations. One of the major challenges for any system seeking to be an IBOR will be the timely publication and integration of transaction data ideally, but potentially position feeds too, from the various underlying silo systems into the IBOR

Matthies: • Identifying the disparate events and contributors that drive the potential changes to an IBOR position—for example, changes in corporate actions, exceptions in the matching and confirmation process, and changes in the clearing and settlement process.

• Connecting to and managing these drivers so that the portfolio manager does not transfer reliance from a start-of-day technology challenge to an ongoing intra-day technology challenge. If the IBOR platform is not well-connected to sources of data and these connections are not reliable and robust, the quality of the IBOR data will suffer.

• Providing sufficient transparency and flexibility so that as the needs of the portfolio manager change in response to complex and changing market landscapes, the IBOR framework can adapt. For instance, as centralized clearing continues to



Shan Nijjar
M&G

grow, data management requirements for IBOR will have to evolve.

• Aligning operational processes to serve the separate demands of the IBOR and the ABOR while still remaining cost-effective.

Warren: The obvious challenge for producing IBOR is the management of effective date transaction processing for ABOR versus the real-time trade date transactions required for IBOR. Getting that complete intra-day position data fast and accurately from multiple sources is at the crux of the problem. Ideally, fund accounting technology should be adapted to handle a single transaction on both ABOR (T+1) and IBOR (T) by creating different views against the same transaction and creating ABOR and IBOR portfolio views concurrently. Special care needs to be taken with the inclusion/exclusion of additional data, such as corporate actions, depending on the time zone of the fund's valuation point to the time zone of the securities' associated market (where the intra-day valuation point of the fund may be before the opening of the associated exchange). Rules need to determine inclusion in IBOR versus potential exclusion within ABOR of same-day event processing. Other areas include independent pricing against the views and soft verification and locking of data at ABOR/IBOR views independently, thus servicing the needs of both the back and middle offices.

> "An IBOR is continuously updated and can therefore provide start-of-day positions that are updated to take into account all known events affecting positions at that point in time. A further benefit of using IBOR as the source of position data is that it should be able to provide multiple views of positions according to the different stages of the trade lifecycle such as orders, confirmed trades and settled trades. Investment accounting systems that are responsible for providing the ABOR typically only hold positions in a contracted state." **Julian Webb, DST Global Solutions**

M&G Investment Management: IBOR will be a demanding application, with messaging links from multiple line-of-business systems and downstream position feeds into multiple core and tactical applications. Internally, it will monitor the life cycles of all drivers of position change, and will extract flexible and diverse position views from that data. It is very much a live operational system, managing data in near-real time. We need to keep the business intelligence workload away from IBOR, and we expect that many IBOR clients will run a data warehouse alongside IBOR to satisfy business-intelligence demands.

While meeting the challenge of being a central position manager for all applications, IBOR needs to be very tightly scoped. It is not processing trades, running corporate actions or managing collateral—it is a consistent view across these line-of-business systems which are processing the real transactions. IBOR must be drawn with a sharp pencil, and do all and only what is necessary to deliver a position data management service.

Many asset managers have implemented data quality management and exception-processing for market and reference data. This is becoming an established culture, and has shown benefits in the reduction of exceptions, improved pricing, and more dependable entity identifiers. Asset managers now have data management departments. Systems have emerged that provide exception-management workflow, as well as persistent storage for market and reference data, to support those data management teams. To date, position data has not benefitted from the same culture, and we tend to have just accepted whatever position data is delivered to us by our internal processes or from service providers, so long as basic reconciliations are completed. We now need to implement active quality management for position data, and IBOR is the tool which will support this.

Webb: The key challenges are:

• The ability to receive and process data in real time so that the data can be released in near real time so that the IBOR remains current.

• Putting in place the operational processes and systems to ensure that all the IBOR input data, which drives changes in positions and valuations, is accurate.

• The ability to integrate and aggregate data from multiple sources/systems—having a separate IBOR is more important for firms with multiple OMSs (e.g., equity versus fixed income) or other sources/systems that also need to share data.

• The ability to handle the sheer volumes of data.

Cullen: Despite what many vendors say, most sophisticated asset managers rely on multiple trading and accounting systems and data sources to manage their various asset classes. Global firms typically require multiple and regional IBORs. The timing of pricing, and other data required to achieve IBOR can have a direct impact on the ability to receive reliable and timely IBOR information. This can only be achieved by a data-centric approach. Accounting systems can gather a single line data summary for an asset and report on it, but experience shows the real value of IBOR is a single, holistic view of all assets with the level of detail required to provide asset managers and asset owners with a comprehensive and detailed view of their assets. The technology that enables this must also provide the ability to drill into and slice and dice the data according to their specific requirements. This includes simple assets such as equities, which are easy to manage, but also includes items such as index-linked assets where the direct exposure value is only a small perspective on the overall exposure of the asset.

Q What legacy technology issues need to be addressed before buy-side firms can realistically start producing daily IBOR information?

Webb: Traditionally, asset management firms have tended to have accounting-centric architectures and these tend to be associated with batch-based overnight processes. Put simply, a lot of technology out there doesn't have continuous processing ability—it wasn't built for that.

This (intra-day/real-time) processing is the key issue.

The second issue that we know firms suffer with is data aggregation—the ability to be able to calculate from multiple source systems and to be able to consolidate and aggregate this data in a manner that is business aware and intelligent, is a challenge. Simple data warehousing lacks business logic. We undertook a recent survey with Aite Group on investment data management, and data aggregation was top in the list of problems globally for both asset and wealth managers.

> "The greatest business advantage is that the IBOR provides the most-up-to-date position data to drive better portfolio and trading decisions. Without an IBOR system, the front office must either work off partial and out-of-date data, or produce IBOR figures manually, which can be time-consuming, lead to portfolios not being ready to trade when markets open, and an inefficient use of highly skilled and expensive alpha producers' time. Other systems also benefit from the same high-quality position data, which previously they would have to do without or calculate themselves."
> **Todd Healy, BMO Asset Management**

Matthies: Many buy-side firms manage with technology solutions that are poorly aligned to their operational processes. Projects to implement solutions at different parts of the investment life cycle are rarely holistic in their design or delivery. The "plumbing and wiring" to keep these solutions working is very often complex and difficult to unwind, but should be identified and reassessed—to identify whether they advance or hold back a move to an IBOR model.

Cullen: The issue with producing IBOR isn't so much about dealing with legacy systems as it is working with a system that was not designed to produce timely and accurate IBOR. The accounting approach does not provide the necessary granularity and the enterprise data management (EDM) approach was not meant to handle record-keeping. While each approach has its limitations, a data-centric approach allows for a "fit-for-purpose," single, consolidated view by portfolio and by asset class that supports the look-through required to help make informed decisions. This is a supportable, sustainable solution that balances current and future technology requirements with new regulatory- or client-driven demands. If you agree, the single most important challenge firms have is effectively managing their data. This includes reference data details associated with assets, along with all attributes to provide meaningful analysis to end-users. Many legacy systems suggest they can support any asset class in a single platform, but typically they don't support the level of detail required, particularly with alternative assets. Another issue with legacy technologies is the challenge around data integration. It is very difficult, and in many cases impossible, to bring data in from external sources while maintaining the source integrity, with the level of detail required for IBOR.

Todd Healy
BMO Asset Management

Warren: In order to start producing a daily IBOR view, the firm will need to ensure it has in place comprehensive accounting technology that can process both ABOR and IBOR concurrently and automate the data flows seamlessly. It is critical that the production of IBOR becomes a bi-product of the asset-servicing activities currently being performed for ABOR, and that the data integrity checks are inclusive and automated. The data produced for IBOR should be available immediately, online in real time and delivered via formatted reports as well as integrated data flows to downstream systems.

Healy: First, buy-side firms must re-examine their disparate system landscape that has rendered multiple data silos that need to be reconciled. Next, they need to evaluate state-of-the-art technology founded on centralized position-keeping and centralized portfolio calculations, as the basis of their investment workflows. The transition from an ABOR mind-set to an IBOR mind-set takes commitment and buy-in from all levels of the firm.

Q How can technology vendors assist buy-side firms in ensuring that they have the necessary applications and architecture to allow them to produce daily IBOR information?

Matthies: The best implementation of an IBOR model will take into account that this is not solely a technological or an operations challenge. Infrastructure and connectivity constraints, however, cannot hold back businesses' evolving information needs. Technology vendors have to offer infrastructure and application solutions that enable better business operations in a cost-effective and flexible way. Within the large and complex, global investment community, vendors have to be able to provide community-based models for the exchange of information, including corporate actions and trade statuses that will drive the quality of IBOR positions. Vendors must be able to handle the complexity behind the translation of these information flows and deliver the information so that asset and investment managers can concentrate on controlling the IBOR position itself, rather than worrying about the collection and processing of data.

Webb: While the industry is working toward a commonly accepted definition of IBOR, individual firm requirements and the implementation path to achieving those will be different in each case. I think that technology vendors have to work with firms to understand what they want to achieve from their IBOR solution. This will allow an optimal solution to be defined for them. Successful IBOR implementations will also involve some degree of operational change as well as a technology implementation, and vendors need to recognize that.

IBOR can seem quite "big bang" and there is clearly still a reluctance in many quarters to undertake disruptive technology projects. We believe there are strategies firms can undertake to reduce risk and implement an IBOR in a phased and non-invasive manner.

> "IBOR will be a demanding application, with messaging links from multiple line-of-business systems and downstream position feeds into multiple core and tactical applications. Internally, it will monitor the life cycles of all drivers of position change, and will extract flexible and diverse position views from that data. It is very much a live operational system, managing data in near-real time." **M&G Investment Management**

Cullen: Vendors that can help firms ensure they have the right systems and process for producing IBOR are the ones that can see the overall picture of the firm's data and investment-decision needs. Vendor solutions that employ a data-centric approach with a message-based platform can interact and subscribe to any financial event that could impact the IBOR. Eagle's product suite was designed specifically for this purpose and offers a unique perspective to buy-side firms. The concept of IBOR is not new; firms have always required a single overall view of assets. This was historically done by combining multiple reports manually into a single view. The value of working with a firm like Eagle is that we can leverage all the effort made to create an IBOR and use the same information for true portfolio management functions including compliance, risk, performance measurement and attribution along with highly flexible reporting views using business-intelligence tools.

Ian Hunt
M&G

Warren: At SunGard, we believe the production of integrated ABOR and IBOR processing is just the beginning. Our flagship fund accounting and administration application, Asset Arena InvestOne, has been creating simultaneous IBOR/ABOR since 2009 and now has over 5,000 portfolios processing on this architecture, globally. This year we've extended its functionality to support multiple books of record (MBOR). We think MBOR is the new paradigm in investment accounting. MBOR extends the integrity of ABOR and IBOR to simultaneously support competing demands from accountants, regulators, tax groups, and new geographies, as well as the front and middle office. Best practices would suggest that a firm define numerous synchronized books—each for a different function, and each with its own effective date, accounting rules, currencies and the like. By making the data multi-faceted—based on the same logic as concurrent ABOR/IBOR from a single transaction—InvestOne MBOR can support multiple base currencies, generally accepted accounting principles (GAAP), International Financial Reporting Standards (IFRS), tax, Foreign Account Tax Compliance Act (Fatca), financial reporting, middle office, and more. This is all from a single, automated solution based on a single source of transaction data—no duplicate systems, no out-of-synch records, and far less operational cost and risk. So, preserving the integrity of data this way is truly ground-breaking. ■

* *Input from M&G Investment Management provided by Rodney Hutchinson, head of strategy and planning within business change; Shan Nijjar, head of IS strategy and architecture; and Ian Hunt, consultant to M&G, and subject matter expert on IBOR.*

waters