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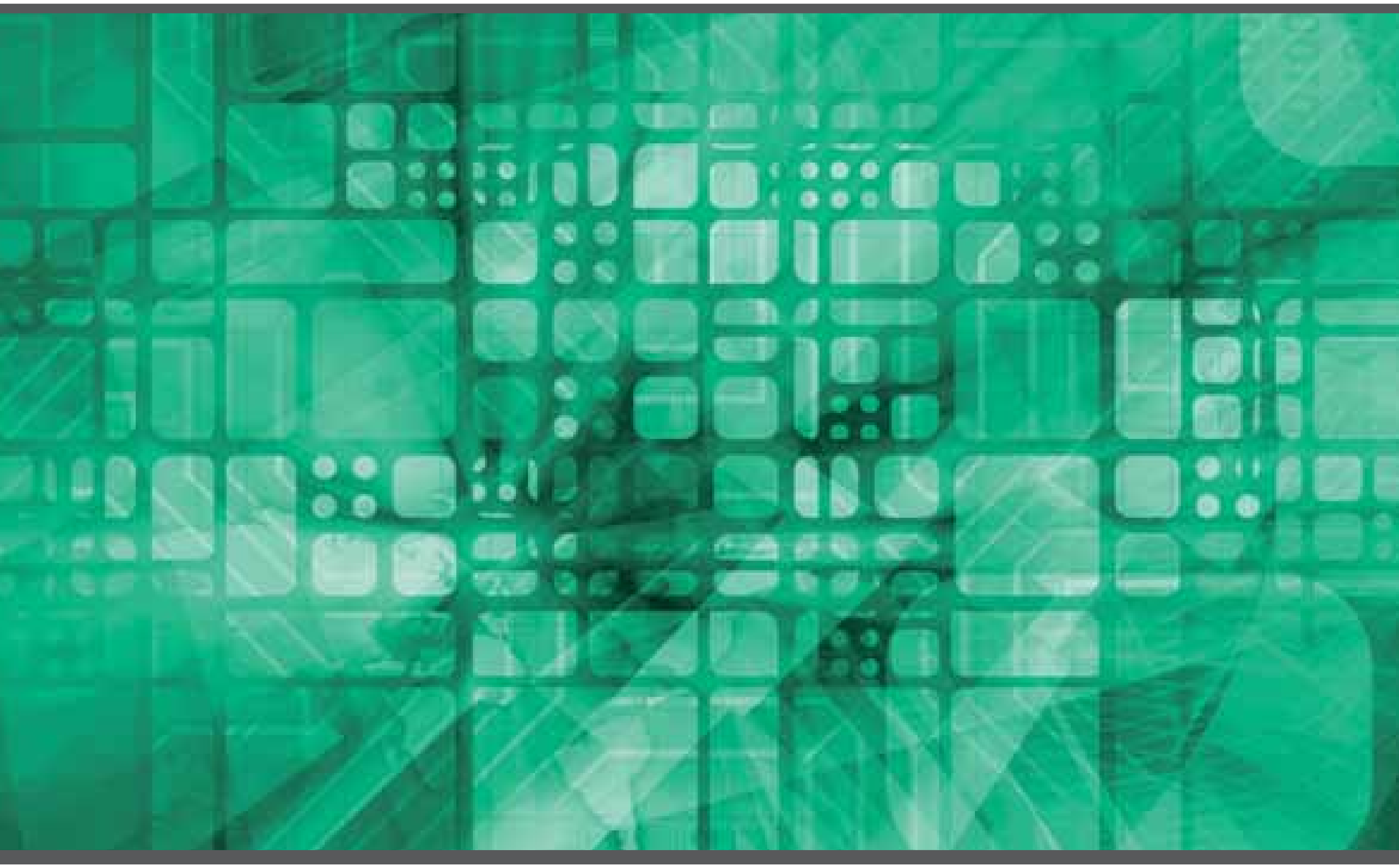
IBOR

Special Report



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IBOR: Business Benefits But at a Cost

The investment book of record (IBOR) has had a short but interesting history, marked by a phase of indifference followed by a period of intense appeal. Barclays Global Investors claims to have built the first such system back in 1999, but from there the IBOR trail turned cold and the underlying technologies and business drivers were apparently forgotten. It was some time after the global financial crisis that IBOR started buzzing again, as vendors began hawking such solutions to the buy side, and asset managers began multi-year implementations, convinced of IBOR's business case.

These days you can't have a conversation about portfolio management without IBOR being mentioned. The vendors that sell the technology evangelize about its benefits to traders and portfolio managers as well as to those in the middle and back office. Advocates argue that all but the smallest buy-side shops would benefit from switching from spreadsheets to an IBOR.

Aggregating positional data for accurate start-of-day and intra-day portfolio views is not a novel concept, and to some degree, it can be done without an IBOR. But it is manually intensive and time-consuming, and a waste of a portfolio manager's time. Data is often siloed by business line or asset class, so it can't be retrieved with the push of a button. However, IBOR's biggest advantage is that it automatically centralizes firms' holdings data; it processes trades, corporate actions, and other events; and can spit out updated reports in real time. In short, it creates a single version of the truth and shows users, on demand, what that version is.

Ideally, this holistic view of data results in better investment decisions by buy-side firms. But as you'll read in the Q&A section, Igor Lobanov of UK-based Legal and General Investment Management has a twist on that assumption. Lobanov and Canada Pension Plan Investment Board CTO Jeffrey Hurley give their takes on the advantages and disadvantages of IBOR technology in this report.

This is *Waters*' second IBOR special report in six months, which says something about the level of interest in the IBOR phenomenon, although there are still technology and operational challenges associated with it: integration of order, execution and portfolio management systems, for example, or the considerable time and complexity it takes to install the underlying technology. However, with the aid of reports like this one, firms will at least understand better what they're up against.

Jake Thomases
US Staff Writer, *Waters*

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BMO Asset Management Adds IBOR Functionality

Bank of Montreal (BMO) Asset Management recently completed the implementation of an investment book of record (IBOR) system, according to Chicago-based vice president at BMO, Todd Healy. The IBOR project took about three years to plan and put in place, according to Healy.

"It isn't a simple, quick win," Healy explains. "We had to run it like any other significant project—monitor it for its scope, have a good project manager, hold people accountable, and direct it from the top. There needs to be a common understanding of what your objective is."

BMO pursued the IBOR project to integrate multiple data systems that were "pain points," says Healy. "We were looking at how we could consolidate and collapse a lot of it. It's a big expense and a big project, but we've done well on the run-rate side. We've seen a true effect on the bottom line, and I see benefits for our portfolio managers and traders, too."


Todd Healy, BMO

Charles River to Enter IBOR Fray

Later this year, Burlington, Mass.-based Charles River Development will unveil a module that will allow its buy-side clients to manage their investment book of record (IBOR) activities. The IBOR functionality will be deployed as part of version 9.2 of the Charles River Investment Management Solution (IMS), the vendor's flagship buy-side-focused front-office platform. Chang Suh, senior product manager at Charles River, says the IMS suite already has functionality to provide portfolio managers and traders with intra-day position updates and risk-related data from back-office systems, fund administrators and custodians. The vendor needed to add support for start-of-day positions and tax lots from within the platform, allowing those functions to be handled on an overnight basis.

Waters Panel: No One Way to Justify an IBOR

There is no single way of making a business case for an IBOR—not when it still means so many different things to different people, according to panelists at a recent *Waters*' IBOR breakfast briefing.

Todd Healy, vice president at BMO Asset Management, said it's about having a consistent view of one's data, while SimCorp managing director, David Kubersky, argued that an IBOR can provide users with not only a consistent view of their data, but also the right data in the first place, citing a study in which 40 percent of traders admitted to making decisions based on bad data.

Jay Vyas, Canadian Pension Plan Investment Board's (CPPIB's) head of quantitative investing, suggested that producing an accurate picture of investment holdings is a motivator for developing an IBOR. "We span public markets, private markets, equity, real estate, private equity, infrastructure, and private debt, so we have all kinds of investments, and as an organization with a mandate to manage public assets, we certainly need to have a view of our risks and exposures," Vyas explained. "Right now, that has to be pulled together on a customized basis. It's almost bespoke whenever you need to do it. So the ability to reflexively view our holdings and investments is a main driver for an IBOR."

> "It's almost bespoke whenever you need to do it. So the ability to reflexively view our holdings and investments is a main driver for an IBOR." **Jay Vyas, Canadian Pension Plan Investment Board**

BMO's Healy added: "Do I have confidence in that beginning-of-day view of my portfolio? We can all agree that our order management systems do a fine job if they've got a good starting slot to begin the day. The challenge is having that good start and having information flow back and forth so that things are in balance."

Because the front, middle, and back offices see IBOR as a potential solution to their needs, Fiserv's director of product management, Rich Adams, said that it needs to have configurable alerts and data, although he added a caveat: Its core functionality should be helping traders and portfolio managers make better trading decisions.

Four Drivers to Develop an IBOR

At a recent IBOR Breakfast Briefing hosted by *Waters*, consultant Barry Chester, who founded Barry Chester & Co. in 2000, laid out four key drivers for establishing an IBOR. By Anthony Malakian

Before starting an IBOR project, firms should first identify who is responsible for driving the IBOR initiative, and what problems they are looking to solve, according to consultant Barry Chester. Firms also need to spend some time and effort thinking about the gaps they have in their already-functioning investment process, both from a departmental and an organizational perspective. There are four themes that surround developing an IBOR, said Chester: enterprise drivers, portfolio management drivers, control and flexibility drivers, and technical strategy.

Enterprise Drivers

This area comes down to the idea of a single version of the truth. As their trading schemes become more complex and expansive, many firms end up with multiple trading systems and accounting systems. "It does obstruct the ability to get coherent views of positions and exposures across the enterprise, because the data is often going to be in a piecemeal state, in separate databases, and it might have separate structures, different levels of detail, and different processes around it," Chester explained.

Enterprise structures like pre-trade compliance, firm-wide position reporting and enterprise risk management have legitimate needs for these views across positions. There's a need for data to be up-to-the-minute or close to it. "When it takes time to pull information from a number of databases, that puts you at a disadvantage when others have more immediate access to their data," he said.

Portfolio Management Drivers

Portfolio managers need position data that extends beyond the enterprise's needs. They need tailored views of portfolios and their component holdings, and specific strategies that are being implemented. As an example, for modeling or portfolio construction, managers might need to combine portfolios or divide them into sleeves.

This leads to the need to create a shadow set of accounts that may not cleanly align with the accounting view of the world. It can also lead to the realization that records used by portfolio managers need to be independent of the accounting system in order to preserve those degrees of freedom.

"Such insight into the behavior of assets could be the secret sauce of your strategy and it's the rare accounting system that will accommodate these endless variations," Chester said. "In fact, I've been involved with asset managers that allowed, and encouraged, specific investment departments to maintain their own versions of the security master for this very reason."

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> **Barry Chester, Barry Chester & Co.**

Control and Flexibility Driver

Keeping an IBOR and an accounting book of record (ABOR) independent is important. First, portfolio managers don't want to be tied to accounting system updates. Also, ABORs will not generally have open orders, much less orders that are being considered but have not yet been placed. Finally, many portfolio managers see the separation of ABOR and IBOR as a good control on the ABOR itself.

"If you've outsourced your accounting function to another company, or are considering doing so, or even might conceivably do so at some point in the future, you have a minimum need to set up a shadow book of record on your side for the purpose of overseeing that relationship and reconcile," Chester said. "This is widely recognized in the industry as a best practice. It further forces an architecture that favors arm's-length, controlled, separation of duties, which enables a smoother transition from one provider to another when the time comes."


Barry Chester

Technical Strategy

While technical strategy may be a driving force behind the development of an IBOR, Chester said it was important that the decision to create an IBOR should come from the business and not from IT.

"IBORs have been around for decades, developed by tech-savvy portfolio managers, using spreadsheets or Microsoft Access," he said. "They're tailored to specific strategies and may contain extensions to the core set of portfolio data that's coming from an ABOR. This has worked for a long time, but the question is: Is it really the best way to fill the need?"

Other technical debates include real-time versus on-demand data projection, independent books that reconcile versus an IBOR that refreshes from the ABOR, and whether or not the IBOR and ABOR should use the same physical database. ■

Caveat Emptor

The IBOR phenomenon has been knocking around the buy side for long enough now for most practitioners to agree that its business benefits are indisputable. But in the same breath, anyone with hands-on IBOR experience is likely to mention its universal caveat: Such projects—which amount to little more than multi-year, complex data management initiatives—are not for the fainthearted, and must be accompanied by a solid, focused business case if the anticipated benefits are to be realized.

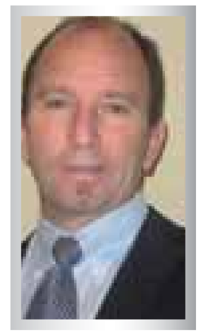
Q In a decade, will all buy-side firms with institutional mandates have some sort of investment book of record (IBOR) in place, irrespective of what that framework might look like?

Marc Schröter, senior vice president, Strategic Research, SimCorp: Buy-side firms cannot afford not to assemble an IBOR. With the continuous onslaught of regulation, the move toward globalized operations for most firms, and the increasing complexity of assets, the "golden truth" provided by an IBOR will be necessary for a firm to know what they own, what it's worth, and what their exposure is. This cannot be done without an IBOR. The leaders in the industry recognize that consolidated position-keeping across the firm's entire book of business will be pivotal in supporting alpha-generators.

Mike de Verteuil, business development director, Linedata: It's perhaps too simplistic to say that every firm will have an IBOR, but for some categories of market player, it will be a necessity. It depends on the size of the business, its complexity and the frequency of trading—but most asset managers will need a solution to address particular problems, whether it's better quality data for trading, or more timely and complete data for risk and regulatory reporting. Whether they will be badged as "IBOR" platforms is an open question—the definition is still somewhat of a moveable feast.

Igor Lobanov, enterprise architect, Legal and General Investment Management: I think it's important to remember that IBOR, as a capability, is different from a solution. The capability to see what your current position is, with up-to-date availability, is more or less available to all buy-side firms already, because they have to be able to manage their money. They already have it. Now, when we're talking about a solution, a system, which is event-driven and real time, I don't think that in 10 years' time everyone will have one. Not everyone needs it. Firms that trade daily or less frequently don't need this intra-day view, and neither do firms that have their trading done somewhere else, like pension schemes. So no, I don't think it will be universal, but there will be more timeliness, and a greater depth of information about current holdings among buy-side firms in the future.

> "There is no one-size-fits-all IBOR model. Each firm needs to consider their actual business needs as well as their capability to support it. For less complex domestic managers, the benefits obtained with an IBOR solution may not justify the investment. To achieve this single, timely view of the book, firms are faced with large-scale data and process reengineering projects which are hard to justify unless some of the existing technical and operational debt is going to be eliminated or at least improved." **Jeremy M. Hurwitz, InvestTech Systems Consulting**



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Jeremy M. Hurwitz, president, InvestTech Systems Consulting: InvestTech believes that the priority and pressure to support some kind of consolidated and timely view of the total book of record will continue to persist, but feels that this needs to be constantly challenged and "reality checked" against ever changing investment management demand drivers. InvestTech has created a Business Data Demand Model (BDDM) to help firms differentiate these needs to make an informed decision about the industry and vendor-created IBOR demand cycle.

Jeffrey Hurley, CTO, Canada Pension Plan Investment Board: Yes.

Martin Engdal, director, market strategist and solution marketing, Advent Software: While the concept of maintaining an IBOR has become more important and is perhaps the practice of many, the idea is not new. Advent's Geneva was originally developed to be an IBOR for one of our clients and is used today as a single or consolidated book of record in many institutions. However, in recent years, with the growing demand for an open, transparent picture of all positions, regardless of where they are within the transaction lifecycle, it has become a must-have for larger financial institutions.

IBOR is more than a transparent start-of-day position. Institutional investors are looking for a position in near real time according to the role and demands of the end-user. In this instance, we refer to the term multiple book of records (MBOR). MBOR allows different roles to see a derived "on-the-fly" position at the same time, satisfying the investment decision team, through to the dealers, all the way through to the settlements, corporate actions, and standing data teams.

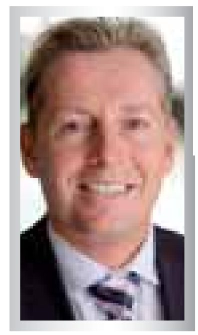
Q Typically, what information—both internal and external—is consumed by an IBOR, and what are the challenges associated with ingesting that quantity and variety of data on an intra-day and overnight basis?

Mal Cullen, managing director, head of Americas and Eagle ACCESS: The value an IBOR provides is all about assessing positions and cash flows as any impacting event occurs. There are a multitude of financial events during any given day that could impact a firm's positions and cash projections for the future, such as voluntary corporate actions, forecasted cash movements or what-if trades. Further, not every consumer of the firm's IBOR agrees on the definition of what impacts the IBOR, so it is hard to quantify here all of the information that is impacting it on a daily basis. The sheer breadth and depth of data consumed by an IBOR is enormous, so naturally there are inherent challenges with implementing a project of this scope.

Taking into account the amount of data that feeds an IBOR, it can be both a huge operational expense and time-consuming to achieve, particularly where a firm's IBOR architecture requires that external data be reprocessed before being consolidated. Trying to architect something big and complex enough to address those challenges is fraught with difficulty, so approaching a sophisticated IBOR really requires the firm to take a step back and think about the bigger picture—how they view data governance and how that strategy can and should drive their IBOR approach.

Engdal: The information consumed is similar to the data typically consumed by a front or back office: time-stamped transaction information, asset-standing data, and valid price information. However, another important consideration is how data is presented following consumption.

We employ the concept of "as was" to present a historic picture, "as is" to present the current picture, and "as will be" to present a forecast picture. Based on asset-standing data, cash, time stamping, and a price, we can drill down further to show lifecycles of specific transactions, a consolidated view of those transactions, and where they are within the lifecycle to present an accurate position. The challenge lies in the quality of the data and from where that data is being derived. For example, if an IBOR is acting like a shadow to the fund administrator, is it right to maintain asset-standing data at fund administration level or should this function be performed independently?



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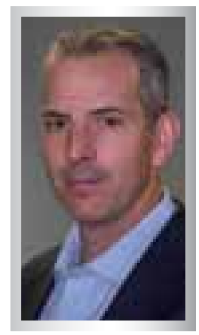
Hurwitz: A full IBOR platform needs to consume nearly all the reference, market, and operational data needed to sustain an investment accounting platform. If your IBOR definition includes projection scenarios and forward-looking impact analysis, then issuer/security terms and conditions have to be fully incorporated to support all aspects of portfolio analysis.

Overall, the main challenges are data overload, data quality, and data limitations based on processing complex securities and operational limitations managing within a 24-hour trading cycle. Without a complete view of the total portfolio book from the top of the house, the core value proposition of IBOR is at risk. This implies that hard-to-access assets like private equity, real assets, structured products, and derivatives all need to be accurately represented.

De Verteuil: It depends on how the IBOR is operating, and what it's trying to achieve. If it's simply aggregating data for risk and reporting purposes, the granularity of that data is fairly standard. But if it's also applying event data—such as position status changes, corporate actions or income flows—and applying that to positions, then there are challenges around the timeliness of that data, how readily available it is, and its quality. This latter can be a trickier issue to address than sheer quantity—quality is about governance and process, rather than technical capability. For example, how the IBOR solution recognizes errors, or positions that need to be revised, and communicates that with the systems that rely on it, is a key element and one of the biggest challenges.



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Lobanov: It's the complexity of the data itself that is the challenge. It's not particularly well understood, and there aren't enough standards to describe what the data means. And also, the technical challenges related to the integration capabilities are that data may come in different formats, from different time points, and with different quality. A company that wants to put it all into a processing engine still needs to solve the problem of delivering data in the right format. It's a huge integration challenge, and the companies that are best-placed to tackle that have, normally, invested significantly over the past few years in their application integration technologies.

> "The value an IBOR provides is all about assessing positions and cash flows as any impacting event occurs. There are a multitude of financial events during any given day that could impact a firm's positions and cash projections for the future, such as voluntary corporate actions, forecasted cash movements or what-if trades. Further, not every consumer of the firm's IBOR agrees on the definition of what impacts the IBOR, so it is hard to quantify here all of the information that is impacting it on a daily basis." **Mal Cullen, Eagle Investment Systems**

Hurley: Real-time positional data to maximize the investment opportunities and ensure full investment, and one version of the truth between the front office and back office. The real-time integration of the front-office and back-office systems is a big challenge. For example, the majority of firms have a portfolio management system and order management system, and an execution management system, partnered with a back-office accounting system. These systems are usually connected through an in-house-developed solution that extracts, transforms, and loads the data between these systems. An IBOR offers an off-the-shelf solution with real-time synchronization of corporate actions, subscriptions, redemptions, and cash movements, providing a consolidated view.

Schröter: Three key requirements of an IBOR are that it can capture, calculate and disseminate. Data that must be captured are positions drivers for all instruments, or any event that impacts the position lifecycle. This includes orders, executions, confirmations, redemptions, maturities, collateral, rollovers, and so on. After calculating, the IBOR should be capable of disseminating all the calculated information in terms of positions, valuations, and analytics, as well as forecasts of cash and security positions to a range of consuming systems. It also must provide advanced data toolsets that can publish data in multiple formats via a range of transport mechanisms. As for integration with source systems, an IBOR should also provide event-driven distribution to receiving systems, which can also be accomplished immediately as events occur in near real time. Ingesting this quantity and variety of data on an intra-day and overnight basis is only a challenge if the IBOR cannot accommodate for multi-asset coverage. In a sophisticated IBOR, such volume and speed is inherent.

Q What are the business advantages—for example, better investment decisions and better cash management practices—to be offered on the back of a sophisticated IBOR platform/framework?

De Verteuil: The conventional benefits that IBOR brings—in terms of complete data for reporting, and better quality data for trading—are still the principal drivers. But another way to look at the benefits offered by IBOR is to view the data it holds as the primary investment record, allowing the user to use that data to reconcile against other systems' data.

This becomes particularly valuable if some functions have been outsourced to service providers: Rather than relying on them to present data to you, you can move to a position where you use your in-house data for reconciliation and oversight. It also gives you a degree of independence. If there are problems at your service providers, you have a high-quality in-house record allowing you to continue trading and other operations.

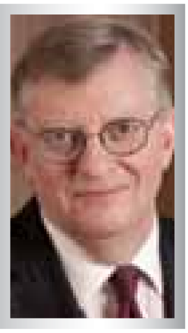
But a word of caution: Those advantages are there if IBOR is operating as a dedicated investment book of records. If it's primarily doing another task, say accounting, and acting as an IBOR on the side, it isn't going to work as well.

Engdal: Having an IBOR or MBOR in place can significantly reduce the operational risk and costs within the investment firm, since investment managers would be making informed decisions based on up-to-date, timely, and future considered data that can be trusted as a clean position. Cash availability, dependent on future events, is key to making an investment decision and an IBOR would provide this information.

Schröter: To the alpha generators in the front office, it is the ability of the IBOR to help them to make the best investment decisions and use their cash and security positions efficiently. Without an IBOR there is not an accurate view on current and forecasted positions including collateral, which can lead to wrong investment decisions and overdraft of unutilized cash. An IBOR will also spare them the task of producing position figures manually—an absurd use of their time. For the risk managers, the value is the ability to derive the most accurate exposure calculations across all instrument types. And for the back office, it's the ability to report accurately on the firm's state of liquidity, cash and collateral positions.

From an organizational perspective, an IBOR provides the data foundation and operational capabilities necessary to expand into new asset classes and investment strategies. An IBOR also provides the foundation for better risk management and regulatory compliance. The multitude of regulatory initiatives highlight the need for an accurate, online view of risks in the form of counterparty exposures across all asset classes, including collateral and exposures to the underlying assets of derivatives.

Perhaps most importantly, a recent study has proven that there exists a direct link between operational effectiveness and the way information is distributed across the organization and portfolio performance. By allowing better control of enterprise data, investment managers can quickly and readily analyze that data in order to improve business performance and retain 51-242 basis points of inherent alpha. Implementing an IBOR provides a complete and integrated positions overview and helps strengthen and streamline the operational infrastructure. At the very heart of operational efficiency is the IBOR.



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Hurley: Firms with high volumes of subscriptions and redemptions, large equity portfolios, large fixed-income portfolios and the corresponding derivative instruments must bear the operational cost of manually updating and synchronizing this data between systems. This contributes to the potential missed opportunity cost of not being fully invested or missing a market opportunity because the portfolio managers are spending their time performing administrative tasks to get an accurate view of their position in the market. An IBOR provides the advantage of not having to spend time reconciling between various systems.

Hurwitz: Some key advantages include:

- Timely, transparent, and accurate view of portfolio data from a single point of control.
- Improved risk management, client reporting and investment analytics to support client service and regulator response cycles through consistent, consolidated and available data.
- Control of data quality—validation, reconciliation, and governance.
- Strategic architectural benefits over traditional accounting-centric infrastructure.
- Migration away from batch models and associated support limitations.

Lobanov: It goes back to the first question. Most successful buy-side firms already have that information to hand—it's just the overhead they experience by getting that information to the fund managers. The main business benefit of having something like an IBOR—an automated, straight-through solution—is that the data delivered has less overhead attached, is more efficient, more accurate, and can enable faster decision-making and more operational efficiencies. It's more about improving processes than actually improving the quality of the decisions. It's about how quickly I can make decisions, and how accurate the information is that I base those decisions on, which can help avoid some unpleasant things. It doesn't particularly help with making better investment decisions. However, there are aspects of front-office processes that are improved by having more accurate positions, such as more efficient views of collateral information. So, trading desks may benefit from it more than a portfolio manager. They can ask where their collateral is, which counterparty they should route a trade to, which is particularly important for over-the-counter trades, where collateral information is crucial. Business benefits, then, have two factors: It's more efficient for operational processes around raising orders and trading, and more transparent when you have better information about where the assets are, which simplifies some of the things that people already do, like collateral optimization.

> **"The real-time integration of the front-office and back-office systems is a big challenge. For example, the majority of firms have a portfolio management system, and order management system, and an execution management system, partnered with a back-office accounting system. These systems are usually connected through an in-house-developed solution that extracts, transforms, and loads the data between these systems. An IBOR offers an off-the-shelf solution with real-time synchronization of corporate actions, subscriptions, redemptions, and cash movements, providing a consolidated view." Jeffrey Hurley, Canada Pension Plan Investment Board**

Q What are the operational and technology challenges that buy-side firms need to consider when weighing up the pros and cons of implementing an IBOR framework?

Engdal: Operationally, there should be little difference between the decisions made and the data repository behind the decision. When a decision to change an investment strategy or reinvest money is made, the investment manager wants to know that the record available is trusted. Data quality and understanding how data is processed is not the key focus of the investment manager. However, we are seeing top executive involvement and sponsorship of these strategic IT projects by CEOs and COOs.

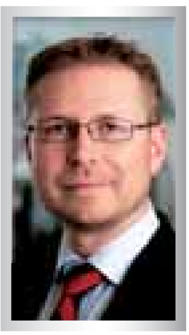
Technology challenges can be found in data access from incumbent suppliers and integration with those data stores. As the industry becomes increasingly aware of IBOR, some legacy applications and methodologies may need to change the way they deliver data and consider a batch-less process. This will be a challenge for many vendors as these types of architectural changes do not happen overnight.

Schröter: The reality today is that many firms have siloed information stacks, numerous accounting systems, and multiple order management systems, which creates dangerous redundancies and makes aggregation to a single source of the truth extremely difficult, if not impossible. Many organizations have also suffered because of disparate information, legacy systems, trying to aggregate data, or attempting to do so with a data warehouse, which still doesn't address the requirements for readily accessible and accurate intra-day investment data.

In addition, there can be challenges in gaining the necessary buy-in from across the organization based on the existing culture and mindset. In order to spearhead an IBOR initiative, it is imperative to illustrate the value and benefits an IBOR delivers to front-to-back-office personnel so that an IBOR project becomes viewed as a firm-wide opportunity, not an unnecessary disruption.

For those concerned with the cost, risk and complexity involved in the implementation, the IBOR should be viewed as a transformational mechanism, to "insulate" and "turn off" legacy applications product-by-product, or workflow-by-workflow. An IBOR doesn't have to take a big-bang approach, but rather it should be broken down into digestible milestones beginning with the areas of consolidation that offer the greatest benefit in the short-term. Of course, many firms will weigh the options of build versus buy. It is important to note that it can be extremely costly to build, especially since there are standard software solutions that provide IBOR capabilities. SimCorp Dimension is the market leader of the handful of solutions available that are designed to handle all position drivers across all instruments and has the data repository and tools to do so today.

Cullen: Firms need to start by looking at their existing infrastructure. In our experience, the very characteristics of a firm that can most benefit from an IBOR (multi-asset class, global, large players) are those that have multiple trading and accounting systems. This makes developing an IBOR a data management initiative. These firms need to look at investment decisions across multiple views—for example, by asset class, exposure, strategy or geography—all of which require attributes not found in the data needed to process



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accounting. The trend toward outsourcing and externally managed assets adds a further layer of complexity in the consolidation of assets into one system that is required to deliver an IBOR. Trying to force the complex web of accounting and trading platforms into a single accounting platform to achieve IBOR will most likely result in data ending up in the wrong place or applications being used for purposes they have not been designed for.

Those are the cons. But, there are obviously some very compelling pros. With a data-centric approach to IBOR, as there is a single source of data, firms have access to the underlying, granular detail they need to make business decisions. In addition they have the ability to both validate and enrich the data across all of the systems allowing the data to be delivered to downstream consumers as they require—not as the accounting or trading system views it. Finally, because new data is not being created or reprocessed, the risk of inaccuracy is greatly reduced and data is available much faster. The entire organization will be using a single, qualified version of the truth, which is a supportable, sustainable solution that balances current and future technology requirements with new regulatory- or client-driven demands.

> "Buy-side firms cannot afford not to assemble an IBOR. With the continuous onslaught of regulation, the move toward globalized operations for most firms, and the increasing complexity of assets, the 'golden truth' provided by an IBOR will be necessary for a firm to know what they own, what it's worth, and what their exposure is. This cannot be done without an IBOR. Consolidated position-keeping across the firm's entire book of business will be pivotal in supporting alpha-generators." **Marc Schröter, SimCorp**

Hurley: First, is treating an IBOR as a technical problem and then given it to IT to deliver. An IBOR should be treated as a solution to business problems and all areas of the firm should participate in the process and share in the benefits.
Second, is understanding that a single point of technology will not necessarily solve all of the business problems, for example using a data warehouse, a low-risk mature technology to deliver investment positions. This solution does not allow for quick system updates; while being a low-cost solution, it provides relatively low value.

De Verteuil: The first and probably biggest obstacle is cost versus value. Often, the feeling is that this is duplication, that this data is already available somewhere else—in the fund accounting or custody systems, for example. That's a difficult challenge to overcome in terms of putting together a business case—it isn't easy to demonstrate that this is a different type of record.

But, essentially, the IBOR is providing something that no other system is providing—namely, the investment prime record. While other systems may have similar data, it's typically on a different time frame, and with a different degree of completeness, consistent with the tasks those systems are performing.

Another challenge is to recognize that firms need a team of people to run the IBOR, to monitor data quality and deal with issues around data ingestion and presentation. While it may not necessarily need to be a large team, this can be an issue, particularly with firms that have outsourced their operational functions.

One other thing to bear in mind is that implementing an IBOR isn't an end in itself. The real benefit is to be found in those surrounding systems that will be using the IBOR as their data source—which means that implementation isn't confined solely to implementing the IBOR. For example, if you want to move from overnight to intra-day or near-real time position refresh for a front-office system, that would require development within the front office to make good use of the IBOR data.

Lobanov: The main technology challenge is to have the integration right, for someone to be able to integrate all of the feeds into the tracking engine, to ensure that data comes in at the right time, the right form, the right shape, and in the right quantity. Operationally, there's a big question mark over who owns the data in the IBOR, and that's something that firms need to resolve. If there's a culture of data governance and stewardship within a firm, then it's relatively easy. One way of framing IBOR is as an extension of market data quality principles to position data. But if firms struggle with the former, they'll inevitably struggle with the latter as well.

Hurwitz: There is no one-size-fits-all IBOR model. Each firm needs to consider their actual business needs as well as their capability to support it. For less complex domestic managers, the benefits obtained with an IBOR solution may not justify the investment. To achieve this single, timely view of the book, firms are faced with large-scale data and process reengineering projects which are hard to justify unless some of the existing technical and operational debt is going to be eliminated or at least improved.

Additional risks/concerns and challenges include:

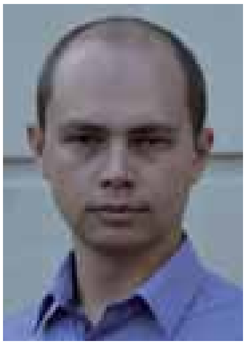
- Frequency of data feeds from internal and external sources to keep the IBOR updated.
- Complex instruments and their lifecycles.
- Difficulty of getting forward-looking cash data right.
- Complexity and potential duplication of event management in a global exchange time-driven zone.
- Ability of IBOR to represent complex instrument positions, structures, strategies and aggregations.
- Ability to store snapshots of IBOR data in a time series at multiple points during the business day, the magnitude of data to be stored, audit trails sophisticated enough to track all of the potential changes, and connectivity to all required sources of data.
- Multiple trading and operational workflows make it difficult to get consolidated firm-wide holdings views.

"IBOR, as a capability, is different from a solution. The capability to see what your current position is, with up-to-date availability, is more or less available to all buy-side firms already, because they have to be able to manage their money. They already have it. Now, when we're talking about a solution, a system, which is event-driven and real time, I don't think that in ten years' time everyone will have one. Not everyone needs it. Firms that trade daily or less frequently don't need this intra-day view, nor do firms that have their trading done somewhere else, like pension schemes." **Igor Lobanov, Legal and General Investment Management**

Q **Now that there are a number of buy-side firms with IBOR implementations under their belts, what can the rest of the industry learn from their travails? What aspects of IBOR projects do buy-side firms tend to underestimate?**

Hurley: There is competitive value in implementing an IBOR, creating opportunities for greater accuracy and transparency throughout the trading day, providing management with the ability to make better investment decisions using information that is as up-to-date as possible.

Engdal: We can assume that many investment managers, who have invested in their technology architecture within the last five to 10 years, already operate with IBOR in mind. The critical piece of an IBOR is that the data quality is pertinent to feed the investment positions. If the quality of the data is poor, the result will be equally disappointing. If they have access to high-quality data, then the real-time derived position could be considered a more trusted source.



Igor Lobanov
Legal and General
Investment Management

Cullen: The main lesson to the industry, at its core, is that IBOR is a data management issue. Buy-side firms looking to implement an IBOR must take a long-term view and look at the implementation as a strategic data governance decision. Achieving IBOR can be a multi-year, multi-strategy process but with the right technology partner and a data-centric approach, accurate, centralized data is achievable. It is tempting to approach data governance by simply focusing on connecting the pipes, especially when budgets are tight and resources are spread thin. However, good data is an asset and needs to be recognized by the business as such. In order for data to be leveraged appropriately, businesses need to own the data and the process in which it is sourced, and institute an organization-wide data governance vision. This process takes time and needs to be mandated and sponsored by senior management.

Further, it is critical that the IBOR solution is built fit-for-purpose. The industry is littered with failed attempts of firms trying to build an IBOR on a system that was not built fit-for-purpose, typically trying to shoehorn it into existing order management or accounting systems. This is incredibly difficult to do and if buy-side firms underestimate anything, it's that they'll be happy with a short-sighted solution.

Hurwitz: We would argue that the industry has yet to deliver—and prove—the true business value and total cost of ownership proposition of an IBOR. Top-tier buy-side firms have yet to achieve true IBOR and many vendors are still developing their capabilities. InvestTech challenges the vendor approach that says the industry should by default go the IBOR route. As we expose using our BDDM model, there needs to be a deeper data impact analysis approach taken by each firm to establish their business case to meet future internal and external business demands. InvestTech incorporates all the key business activities mapped to complex data subject areas and then superimposes the state of the firm's front-, middle-, and back-office applications and EDM capabilities to help expose the enlightened path to a fit-for-purpose solution.

The cost and time to implement and support an independent IBOR engine to generate the investment view of position and cash needs to be weighed against the benefits the asset manager expects to gain from the costly investment. Firms should continue to consider the complexities of the internal data management requirements. Data management has grown in significance and offers the leverage to apply data quality management disciplines to IBOR position data through a single environment and toolset. An IBOR could provide a key EDM architecture capability, potentially providing a single, true source for the multiple consumers of position data and could be a solution to a challenging problem. The motivations to address it are becoming stronger and it is clear that a growing number of asset managers are looking to implement IBOR in some form.

Lobanov: It's not difficult to implement position tracking, either by bringing in a product or by doing it yourselves, depending on what kind of culture is at the firm. But what people underestimate is the amount of time it takes to feed everything into that, and then integrate all of the systems with that information. Unfortunately, that's not something that vendors of these products like to acknowledge, for understandable reasons. But there's a lot of homework that firms need to do, and this tends to be underestimated. Also, the business change to the operating models needed is sometimes operated—for some firms it's a completely new area of operations, a new set of responsibilities for people, and an entirely new way of disseminating information. It's just a huge business challenge.

De Verteuil: There is a tendency to do one of two things with an IBOR implementation. One is to take too narrow a view of what it is intended to do, and fail to put in place a structure that can be scaled up to subsequently incorporate a wider remit, as the benefits of an IBOR are better understood. At the other extreme, the risk is going for a "big bang" and trying to do too much in one go. The ideal is to be very clear about the ultimate goal, and implement a series of incremental steps that allow you, at any point, to draw a line and get value from what's been put in place, before moving on to the next stage.

Schröter: Of all our IBOR installations, SimCorp has a great client success story of a large and multi-region project that included consolidating redundant IT systems in a merger and acquisition (M&A) rationalization process. Central to the firm's strategy was embedding an integrated investment management system as the single investment book of record.

Today, they tell us that having an IBOR at the core of their operations creates a "center of the universe," providing information that feeds everything, and with a single point of control. They no longer need to enter a multitude of disparate systems to fix a price; they can rest assured that the price will be consistent throughout. This type of control is huge and all embracing. If you regard the operational system as hub and spoke, the IBOR serves as the hub, feeding into all their other applications and keeping everything up to date. In the time since they selected SimCorp, they've seen their assets on the system increase by nearly 50 percent, while the operational costs of systems and data are all significantly lower.

Many firms today find themselves exposed to weaknesses in their current operating models. Whether the issues are created by many years of underinvestment across the underlying systems infrastructure or previous decisions to outsource some parts of operations, they find themselves struggling to run their businesses effectively. An investment book of record not only remedies these deficiencies and can lead to a source of sustainable competitive advantage, but also future proofs operations for years to come. The time, investment, and ultimate organization-wide benefits are invaluable.

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