

Implementing a Portfolio Accounting System: Lessons from the Trenches

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Few system implementations can compare to the implementation of a portfolio accounting system in terms of size, complexity, and potential risk. Perhaps you have heard some of the war stories – perhaps some of those stories are your own! Some portfolio accounting system implementations are considered to have been great successes, others less so. There are lessons to be learned from the trenches. Based on some of our collective experiences, there are some practical guidelines for those who are in the midst of, or about to undertake, such an initiative. These observations are not scientific but are practical and shared with the hope that one or more of the following recommendations may help portfolio accounting system implementers navigate some very exciting but risky waters.

Project Management

Do not underestimate how large and complex a portfolio accounting system implementation can be and how important it is to employ experienced and disciplined project management that includes effective risk assessment and sound contingency planning.

- **Project Team Roles and Responsibilities.** Ensure before the project begins that you have defined staffing requirements for the project. People selection plays a key role in the success of any project. The project implementation team should include staff that participated in the system evaluation and selection process as well as dedicated core staff that stay on from testing through production to ensure continuity. You will require a strong Project Manager with the finesse to navigate your internal organization as well as the vendor organization. The project team must also include staff with strong knowledge of firm portfolio accounting practices, as well as staff knowledgeable of system integration requirements, staff experienced with any new technologies to be introduced with the system, and staff who can introduce new workflow and process infrastructure.
- **Project Plan and Timeline.** Establish and sign off on a comprehensive implementation Project Plan that includes specific and realistic milestones. The plan should outline all the steps needed to complete the migration, including training and testing plans.
- **Project Assumptions and Constraints.** Clearly articulate project assumptions and constraints to ensure that the expectations of business sponsors, end users, operations staff, and even the vendor are aligned.

- **Risks.** No project is without risk. Make sure that you identify potential risks and plan for their occurrence. Regularly monitor your risk list and execute your contingency plan when called for.
- **Communication Standards and Status Reporting.** Regularly and proactively communicate project status, issues, and successes. A coordinated communication plan is a good way to reinforce project goals, timelines, benefits, and constraints. In addition to regular status meetings and reports, an internal project web site, project briefings via email, and even a periodic newsletter can be effective communication vehicles.
- **Management of Vendor Deliverables.** It is likely that the vendor-provided portfolio accounting system does not address all your requirements out of the box. Establish a process to regularly assess the status of vendor deliverables and manage vendor deliverables as a potential project risk. You will want to ensure that the vendor focuses on critical issues of quality and supportability of the current version as well as the bells and whistles of future versions.
- **Change Control Procedures.** Implement change control procedures in order to ensure that the introduction of system and workflow process changes are as transparent as possible. Changes should be appropriately authorized and approved, thoroughly tested, sufficiently documented, and implemented at an appropriate time.
- **Issue Escalation Procedures.** Implement a process for tracking issues, leveraging any existing in-house defect tracking system if available. Implement procedures that require that complete information be tracked for each issue such that developers can understand the problem, get an idea of its severity, and reproduce it if necessary. Define what constitutes critical vs. non-critical issues and prioritize issues. Regularly review the status and resolution of issues with the vendor and your end users.

Reference Data

More often than not, firms implementing a new portfolio accounting system underestimate the effort required to establish consistent core reference data, such as security master and portfolio/account master reference data. Your conversion strategy needs to carefully examine your reference data requirements. It needs to take into consideration the source(s) of reference data, how much historical data will need to be converted, and the amount of data cleansing that will need to be done during the conversion process. Establishment of firm-wide standards for consolidating, translating, validating and disseminating quality reference data can result in reduced operational cost and risk.

- **General Reference Data Requirements.** Work backwards from required reports and calculations to identify required data, data sources, and timing. Additionally, you need to identify data that is required to support new functionality but is not currently tracked or easy to get to. Each data vendor should be evaluated to determine if it

provides the best data to meet the needs of the firm. A data vendor should not be chosen just because it is currently being utilized by another system in the firm. Data should be leveraged as much as possible across the organization to maximize business efficiencies and minimize costs.

- **Data Mappings.** Prepare specifications and data mappings for each interface to reference data, leveraging your data vendors as much as possible to provide data definitions for each field, as well as sample data for currently held securities.
- **Data Scrubbing.** While closely examining existing reference data in preparation for the new system, you may potentially discover anomalies in historical information, requiring that data be cleaned up and improved as part of the conversion process. New and changed data should be tested against validation rules and only distributed to downstream systems once it passes all validation edits. Failed edit checks should be reviewed and scrubbed by a business/data analyst. Avoid creating duplicate records or updating the wrong record by clearly defining the matching criteria for inserting a new record and updating an existing record, i.e., cash securities, dually listed securities, issuers, etc. Data scrubbing logic should include an effective date or system date so that corrected vendor data will update the relevant security master record.
- **Security Master.** You may want to consider segmenting the scope of the project by asset type such as domestic equities, foreign equities, corporate bonds, government bonds, municipal bonds, mortgages and derivatives.
- **Portfolio/Account Set-up.** If the new portfolio accounting system supports a better portfolio/account structure, you will need to determine how best to leverage that structure to allow for proper client reporting as early as possible. You will also need to determine which business units will be responsible for supplying the required account reference data and make sure each business unit buys into this strategy.
- **Prices, Exchange Rates, Corporate Actions.** Prices and foreign exchange rates typically are loaded after the security reference data is successfully loaded. Does your system require that prices and exchange rates be loaded prior to conversion of accounting data? You also need to ensure that processes are established to detect missing or incorrect security price information, price tolerance failure, and missing corporate actions, all of which can cause pricing errors.

Conversion Processes

Data conversion is also a significant aspect of a portfolio accounting system implementation and can be a lengthy process depending on the number and types of portfolios to be converted. While the big-bang approach might be feasible for some firms, in many cases, a phased conversion, migrating groups of accounts/portfolios with similar characteristics, is a more manageable approach. There are several things to consider as part of the conversion process. Note that this is by no means an exhaustive list.

- **Conversion from Single System or Multiple Systems.** Conversion from a single system is clearly more manageable than converting from multiple disparate systems, including the migration of any manual or offline processes. If converting from multiple systems, standardize conversion procedures as much as possible and carefully define a phased migration strategy to enable you to easily isolate the cause and source of problems.
- **Automated or Manual or Hybrid Conversion?** Are vendor tools available? If so, you should experiment with vendor conversion utilities to explore their features and file formats supported (fixed width, CVS, Excel, Tab Delimited, other) and determine whether they require tweaking to meet your specific conversion requirements. Moving thousands of records to a new environment is a major milestone, and the procedures must be extensively tested before the actual conversion process begins. You'll need to determine how easy it is to re-convert if problems are encountered during the testing phase. A significant benefit of early data conversion testing is the opportunity to demonstrate new system features using your firm's actual historical data to broader audiences as part of the training and communication cycles.
- **History.** How much history do you need to migrate? How much history is available? Work with both your business users and systems teams to determine historical data requirements and migration limitations, if any.
- **Period-Ends.** When will you convert each fund to the new system? When establishing conversion dates for each portfolio, consider fiscal year-end reporting. Will you convert within a fiscal year-end and collect data from multiple portfolio accounting systems, or will you convert on a fiscal year-end and close off the year on the old accounting system.
- **Reference Data.** Conversion of accounting data will assume that reference data – security master, portfolio master, etc. – is correctly stored in the applicable database tables prior to converting the accounting history. Ensuring the integrity and completeness of your reference data prior to conversion will save you lots of headaches.
- **Tax Lots, Average Cost Lots, Short Positions.** Will you need to convert tax lots or rolled up holdings? Are there any special considerations for converting average cost lots? Do quantity and cost fields for short positions need to be in absolute value format as opposed to negative amounts?
- **Settled and Unsettled Trades.** You may need to convert settled and unsettled trades separately in order to properly establish a receivable/payable for the unsettled trades in the new system.
- **Income Receivables.** You'll need to understand the new system's requirements for converting open income receivables (dividends, coupons, paydowns). Can the system

set up open receivables independent of the trade lots converted? Can open interest amounts be converted at either the lot level or position level?

- **Cash Balances.** What are the new system requirements for converting cash balances?
- **Ledger Balances.** Likewise, what are the new system requirements for converting ledger balances? Can/should ledger processing be enabled during conversion?
- **Corporate Actions.** Are there specific system requirements to ensure that corporate actions are converted properly and not double posted post-conversion?
- **Reconciliation.** And last, you will need to reconcile the converted data (e.g., units, cash, income, market values, etc.) to your prior books of record. You will need to note and review exceptions and, to the extent reasonably feasible, correct them prior to moving into production mode with the new system. Wherever possible, you should employ automated reconciliation tools – vendor provided, other commercially available reconciliation tools, or in-house proprietary reconciliation tools.

Accounting Considerations

The new portfolio accounting system likely offers new functionality not supported by your legacy system. You will need to identify how new functionality may change accounting methods and be prepared to deal with those changes; for example, coordinating with auditors, addressing price or yield issues on conversion date, booking lump sum catch-up accruals, etc. If the new system provides functionality to customize business rules to support new and complex security types, support complex and evolving fund structures, and address new accounting regulations and tax code changes, you will want to ensure that the appropriate business analysts are trained. This will reduce your dependence on the vendor or your own internal IT development resources allowing you to rapidly respond to changes resulting from internal and external business forces. Some specific configurations and processing requirements to consider include:

- **Accounting Basis.** Does the new system support multiple accounting bases enabling you to store transactions using different sets of accounting books and establish a default basis for each portfolio/account?
- **Accounting periods.** Are there specific considerations for establishing accounting periods? Can accounting periods be established to meet client-specific reporting requirements?
- **Exception Processing.** You need to define and implement standard procedures for quickly and easily reviewing and editing exceptions with minimal manual intervention, and resubmitting the corrections back to the portfolio accounting system, which should back out and reprocess the trades automatically.

- **Derivatives Processing.** If your prior system did not provide support for derivatives, you will need to establish standard operational procedures for processing derivatives on the new system, including workflow changes.
- **Data Retention.** What data needs to be retained and for how long? You will need to work with auditors to determine data retention requirements and make sure that you understand system requirements for archiving (and retrieving) data.
- **Legal and Regulatory Requirements.** If the new system does not support legal and regulatory requirements, such as Schedule D and Canadian Tax Reporting out of the box, you will need to leverage resources – internal and perhaps even external – who are knowledgeable in the specifics of the data and procedures required to produce complete and accurate reports.

Re-engineering Trade Operations Workflows

Any major system implementation must be accompanied by a review of current processes, careful refinement of workflow, quality processes, operating procedures, and even human resource practices. Implementation of a new portfolio accounting system is no different and will likely require that you redefine some business processes and get people to work differently. This can be a tough nut to crack. You cannot ignore how the new system might impact current workflow. You need to tackle the changes and people issues necessary to make the new accounting system successful for your firm.

- **Process Flows, Procedures and Documentation.** Document current process flows and operational procedures so that you have a complete picture of the current interactions of data, upstream and downstream systems, and people against which you can develop your future-processing model. Proper analysis requires that you assess current requirements as well as future requirements, focusing not only on improving current operations, but also defining where business and technical operations need to be to remain competitive in the future. For example, batch cycles may need to be replaced with intraday updates.
- **Exceptions Management.** Exceptions management is a critical component to realizing STP. Leverage all opportunities to eliminate manual exception processing, and establish an automated environment based on flexible content, quality, and integrity checks.
- **Integration.** Critical to the success of a new portfolio accounting system are carefully designed interfaces that follow industry standards as much as possible – interfaces from the trading system(s) to the accounting system; interfaces to/from the pricing system; interfaces to cash management, performance and attribution, portfolio valuation reporting, custody and more. Seamless interfaces to and from all upstream and downstream systems are essential to firm-wide operational efficiency and internal and external STP. You will need to identify all inbound and outbound feeds, and

coordinate and estimate integration efforts with recipient systems or feeding system vendors.

Reporting

Most systems are delivered with a standard set of operational and accounting reports, but also provide you with the ability to create customized calculations, reports, and queries to meet the specific needs of your business. You should conduct a gap analysis to determine whether the new portfolio accounting system provides all the reports required by the different business units out of the box. Additionally, you should analyze business and system processes to determine whether the new system, inclusive of all dependent processes, can generate, approve, and distribute report packages within the allotted window of time. Other reporting considerations include:

- **Reporting Packages.** Should the existing report packages be delivered or should report packages be enhanced to take advantage of functionality supported by the new system providing clients with more complex, enhanced, and customized reports? Can you leverage third party query and reporting tools, such as Crystal Reports or Actuate, or is reporting functionality in the new system limited to the vendor's proprietary reporting tool? If the latter, you will need to identify resources – internal or outside consultants – with the requisite skill set to specify and develop required reports.
- **Report Distribution.** What are the distribution needs of the business? Do reports need to be sent via email, web, or PDA device? What scheduling requirements need to be considered? Do you have clients with extremely tight timeframes within which report packages must be produced, approved, and distributed, requiring that you evaluate alternative client reporting solutions?
- **Report Management.** You need to specify security levels, e.g., by business group, that define who has permissions to create and modify reports and report components. You should also consider establishing a standard naming convention for reports and report components to streamline maintenance of your reports library.

Reconciliation

Manual reconciliation is expensive, error-prone and time-consuming – you will need an automated process that allows you to focus on exceptions generated via rules-based matching criteria. Using different automated interfaces to reconcile each separate system is also cumbersome and error-prone. Whether you leverage reconciliation functionality provided by your portfolio accounting system vendor, a commercially available reconciliation system, or even a proprietary in-house system, the reconciliation tool needs to be able to process a significant volume of trades (consider normal and peak processing volumes), balancing end-of-day positions between systems and institutions on a daily, weekly, and/or monthly basis. The reconciliation process should be flexible enough to meet your specific requirements, e.g., multi-site, multi-currency, etc., and be able to

match using alternate security identifiers. You should be able to clearly identify data anomalies and have a consistent and documented business process and workflow for resolution of discrepancies.

Installation, Maintenance, and System Security

Prior to installation of a new portfolio accounting system, you should evaluate your system hardware requirements to ensure that the system can support business and product line growth and be upgraded as necessary to improve throughput over time. In addition to typical operating system and disk capacity maintenance, you will also need to regularly maintain the database. If the accounting system requires multiple databases for each global market you support, you will also need to be concerned with synchronization and maintenance of multiple databases, an additional expense in both time and money.

- **Hardware Sizing.** Do not underestimate the amount of hardware needed to provide the level of performance your users will expect from the system. Users can be unhappy about the initial performance of a new system compared with an older one because highly tuned legacy applications, although hard to learn to use, sometimes have very good performance characteristics. New applications sometimes require some level of tuning to meet performance expectations. Work with your vendor to determine the minimum and optimum hardware configuration based on number of transactions, retention period, projected growth, and more.
- **Remote Access.** If access is required for remote debugging and system maintenance, you will need to ensure that access is properly set up and tested prior to transitioning to production.
- **Development and Testing Environment.** If applicable and supported, you will need to work with your vendor to establish a development and/or test environment in which to build out new functionality, such as reports, without impacting the production environment.
- **System Security.** To ensure that your system is not vulnerable to security attacks from within or without, you will need to establish user profiles and clearance levels to eliminate any risks that even authenticated users might be tempted to browse data they are not authorized to see.
- **Backups and Other System Maintenance.** Backups should take place on a daily basis along with additional regular recommended database, operating system, and disk capacity maintenance. You should also check your recovery procedure regularly.
- **Database Tuning and Throughput.** Tuning is something that you should do not only when you first install your system, but also periodically, to keep the system running at peak efficiency and to compensate for changes that occur over time—such as migrating new business and/or product lines onto the system or adding more users. You may even want to consider third-party commercial products to help you monitor your system performance.

Testing, Training, and Rollout

A new portfolio accounting system cannot be deployed successfully without significant testing, training, and a thorough rollout plan. Testing, training, and performance tuning are obvious areas where, with additional time, more can always be accomplished to make an implementation go more smoothly. However, no matter how much testing you do, some issues will remain in a large application when you go live. The only true test comes when hundreds of users begin stressing the system in production. The same observation holds true for training and tuning; there is no such thing as too much of either. However, you must decide when enough has been accomplished to make the go-live decision.

- **Test Plan.** You will need to develop a comprehensive test plan to guide your firm's efforts to validate the acceptability of the portfolio accounting system. Test plans should document both expected results and exceptions/error handling.
- **Pilot.** When possible, negotiate a trial period or a prototype demonstration using your data in as realistic a setting as possible.
- **User Acceptance Testing and Service Level Agreements.** Prior to moving into parallel, you need to perform final testing of the overall system over some period of time to ensure that it meets end-user acceptance criteria, including response times. Additionally, you will need to make sure that any required service level agreements have been reviewed and accepted by all parties.
- **Scale Testing.** If you project significant business and product growth, you will want to test the system's ability to scale to support increased volumes and handle the stress of a large number of concurrent users. Your testing should simulate volumes and numbers of concurrent users for a typical processing day as well as peak processing periods. As Jonathan Lilienfeld, Vice President of Fund Accounting Systems with Fidelity Investments explains, "each portfolio system has certain activities that stress it more than others. It is important to understand these 'difficult' activities and test them at peak levels." Lilienfeld adds an experience from his days as a portfolio accounting system vendor, "I had one client that had a significant investment in asset-backed securities. A system they tested worked well during the online tests, but when they tested a nightly cycle with 70k to 80k paydowns, the system couldn't finish a nightly cycle in time to start the next business day. The prospective vendor looked at the calendar and pointed out that the issue would only happen on 3 – 4 month-ends a year that were not also weekends, implying that the issue wasn't very important. It wasn't a winning strategy. Therefore, it is as important to define the 'peaks' to be tested as to do the testing."
- **Regression Testing.** Bug fixes should be re-tested to ensure that the problems have been specifically resolved. You should also include baseline functional checks that can be executed in a minimal amount of time to ensure that changes do not adversely impact existing functionality.

- **Parallel Testing.** Once the new system is set up, you should spend a certain amount of time in parallel operation; that is, with both databases operational to ensure that your normal operations continue smoothly under the new architecture and to familiarize everyone with the new system. You will need to identify a team to do the parallel (typically it takes twice as many people during this timeframe). During the initial stages of the parallel, your old system(s) should be your primary system, with all accounting activity duplicated on the new system. You will need to institute a daily reconciliation procedure to ensure that daily data is identical on both systems. Your period of parallel operation will vary, depending on your firm's specific requirements. In most cases, it should include at least one month-end date, so that you can parallel test normal month-end processing.

- **Training.** You need to determine how the users of the system will be trained. Should you leverage vendor training, if available, or do you have an internal training staff that can be trained to provide end-user training? Will training be mandatory? How long before rollout will the training take place? Too far in advance and much will be forgotten; too late will leave users unprepared. Training should be done using scenarios and exercises that simulate, to the best degree possible, real work environments, workflows, and problems. Beyond the software, how will they be trained on the new chart of accounts or posting rules, if applicable, and new or revised operational policies, etc.? And, how much training is required for technical staff (e.g., DBAs) in order that they are competent to maintain and tune the system?
- **Transition Plan to Production.** Finally, you need to establish a plan to transition from parallel to production, making sure that sufficient resources are available to ensure a smooth transition and that the cutover schedule does not conflict with any critical period-end processing to minimize operational risk.

Conclusion

Implementing a new portfolio accounting system is difficult, but with proper planning it need not be a "mission impossible." The system may never seem complete, but one of the key benefits of today's best of breed solutions is the flexibility to quickly respond to changing market conditions and customer preferences.